

# Income Opportunities on Reclaimed Surface Mine Lands In Central Appalachia

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## Introduction

In the central Appalachian coal region of southern West Virginia, eastern Kentucky, southwestern Virginia, and northeastern Tennessee, the unique terrain and economic conditions create unique land use problems. The steeply sloping terrain creates a shortage of land suitable for residential, commercial, or industrial development. Hence, commercial enterprises, industrial activities, and other income opportunities are limited for the residents of these areas.

However, high-quality bituminous coal is abundant in numerous mineable seams in the region and, for nearly a century, have provided the resource for employing the majority of the population through mining and reclamation activities. Surface coal mining operations are constantly producing "new lands" through land reclamation. In some cases, these reclaimed lands have characteristics which will enable them to support non-mining, income-producing activities to a far greater extent than the pro-mining landforms.

The purpose of this paper is to provide a brief overview of income opportunities available to those who own, or have access to, reclaimed surface mined lands with favorable surface characteristics in central Appalachia.

## Land Characteristics in Appalachia

Unmined lands in Central Appalachia are generally steeply sloped with thin, acidic soils unsuited for agricultural uses. Coal mining and timbering are the region's major industries. The region's timber is primarily slow growing upland hardwoods. The steeply sloping terrain has discouraged other industries from locating within the region.

Surface coal mining operators have opportunities to produce lands with the capacity to support other income producing activities. Two major characteristics of the land which can be altered through mining and reclamation are

**Slope:** Steeply sloping, pre-mining landforms can be altered through mining and reclamation to include large areas of gently sloping land; and

**Soils:** Appalachian mountain soils are generally thin, acidic, and infertile. Through the use of controlled overburden placement techniques, overburden materials with superior characteristics are selected, crushed, and placed on the land surface in sufficient thickness to act as a deep rooting medium (Skousen et al. 1987). These carefully selected overburden materials have demonstrated greater potential as a plant-growth medium than the original topsoil (Daniels and Amos 1984, Thurmond and Sencindiver 1986). When gently sloping lands with favorable soil characteristics are produced during surface mining operations, a variety of income-producing activities become available to local residents who have access to those lands.

## Beef Cattle and Other Livestock

Reclaimed surface mined land in Appalachia is often revegetated with forage species that have potential value as livestock feed. Greater utilization of the renewal forage resource is an approach to adding economic diversity to the region. Cattle are generally chosen by Appalachian producers due to their proven weight gains on forage grown on reclaimed areas, their lack of vulnerability

to predators, and accessibility of many Appalachian areas to established cattle markets.

Since 1980, an experimental cattle herd has been maintained on lands owned by Penn Virginia Resources Corp. in Wise County, VA, as a joint venture of Penn Virginia and the Powell River Project. The herd is maintained on reclaimed mine lands on a year round basis. Approximately six acres per cow supply all the forage needed by the herd for the entire year except for small amounts of hay and grain which are provided during the winter months.

Over the past eight years, calf gains have typically been above two pounds per head per day from birth to weaning, and been sold for approximately \$325 per head. An overall 92.6% calf crop has been produced, which is well above the Virginia state average of 85% (Gerken 1988). An economic analysis of the cattle operation has shown that cattle production is profitable.

The ease and cost of fencing, and vehicular access will be major considerations to anyone considering the establishment of a cattle grazing operation on a reclaimed mine site. Small operations (i.e. 20 to 50 head) managed by individuals and their families on acreages near their homes offer the best alternative. The majority of current producers maintain the herd on a part-time basis to supplement income from other employment. Opportunities for establishing large herds (i.e. hundreds of head) on reclaimed lands are generally limited by the unavailability of contiguous land areas of sufficient size to maintain such herds.

### **Christmas Trees**

Christmas tree production can be a profitable land use on reclaimed mine land. Most Christmas tree species grow well on reclaimed minesoils with favorable chemical characteristics that are not excessively compacted. Whereas timber crops take at least 30 years to mature, Christmas trees can be harvested in seven to ten years.

The key to successful Christmas tree production on reclaimed mine sites is selecting suitable minesoils. Growers should look for soils with a pH between five and six. Minesoils with dark gray or black colors should be evaluated carefully, because these colors are often associated with very high or very low pH and/or high levels of soluble salts. The soil must be deep and uncompacted, so that a healthy root system can develop. Sites with standing water

after a rain are probably too compacted or poorly drained to be suitable for Christmas trees. Soil surfaces should be level to gently sloping, and free of large rocks and boulders to allow use of machinery, such as mechanical mowers.

Compared to many agricultural enterprises, Christmas tree production does not require large capital expenditures. Individual growers can easily maintain about five acres of trees in their spare time. The major equipment required to produce Christmas trees can be purchased for as little as \$1500. Seedling costs vary from as little as \$75 per acre for white pine seedlings (approximately 8-10¢ per seedling) to as much as \$850 per acre for Fraser Fir seedlings. The cost to fertilize and to control weeds and pests generally ranges from \$50 to \$100 per acre.

Revenue from the sale of trees will depend upon market conditions, quality of trees, and method of selling. If trees are planted at a rate of 1,050 per acre (6' by 7' spacing), management is sufficient to obtain a 60% survival rate, and the grower is able to obtain a wholesale price of \$10 per tree, the grower will earn about \$6,000 per acre over a 7-10 year period. If superior management yields an 80% survival rate of a more valuable species such as spruce or fir, a \$15 per tree wholesale price will enable the grower to earn approximately \$12,000 per acre over a 10 year period.

Christmas trees are being produced and sold at several sites in West Virginia and Virginia, and results indicate that reclaimed mine sites can produce high-quality Christmas trees (Miller 1987). Guidelines for producing Christmas trees on reclaimed mine lands are available (Torbert et al. 1989).

### **Pine Timber Production**

Forestry is a logical postmining land use for much of the reclaimed land in the Appalachian mountains. Properly reclaimed mine land can produce as good or better tree growth than most natural Appalachian soils. However, the forest production potential of a reclaimed mine site will be strongly influenced by site conditions, as produced by reclamation practices (Davidson et al. 1984). Although nearly all reclaimed mine sites will grow trees, many sites will not be sufficiently productive to make pine timber production a profitable enterprise. In terms of species selection, a landowner should look first at various species of pines. Although many hardwood species (which bring high prices as mature timber) are native to the Appalachian

area, the rates at which these species will grow to maturity for harvesting is far too slow, even on the best of sites (Pass 1985).

In the Appalachians, eastern white pine is generally considered to be the species with the best potential for producing a marketable timber crop (Davidson 1986, Skousen 1989). The more site-tolerant pine species suffer from other problems as a timber investment, such as low market values at harvest (i.e. Virginia pine) or lack of winter hardiness (loblolly pine).

The primary drawback has to do with the length of time required to achieve a return on investment. Even on the best of sites, a time span on the order of 30 years will be required to obtain a marketable crop of pine timber. Given present price and market trends, an acre of eastern white pine timber planted today on a reclaimed mine site with a site index of 100 will likely be worth in excess of \$3,500 (1988 dollars) in 30 years at maturity (Zipper et al. 1987). Once the stand is established, little is required in the way of management until harvest. Guidelines for reclaiming sites to produce pine timber are available (Plass 1976, Torbert et al. 1984, 1986).

### **Horticultural Crops**

The characteristics of appropriately reclaimed mine lands are also suitable for growing horticultural crops such as apples, grapes, and blueberries. The suitability of reclaimed areas for such crops has been demonstrated by research in Virginia and growers in West Virginia and Virginia. Production and profitability are, as noted before, greatly influenced by mining and reclamation practices, and the resulting characteristics of the site (slope, and physical and chemical properties of the minesoil).

### **Residential, Commercial, and Industrial Land Uses**

Land suited for commercial, residential or industrial development is in short supply in many Appalachian communities. Surface mining operations can be conducted so as to yield reclaimed land suited for development. Non-flood prone, flat lands suitable for development bring premium prices in many Appalachian communities, due to scarcities engendered by the natural terrain. As with all land, a primary characteristic of reclaimed land that will

influence development potential is location. Land value is influenced to a large extent by proximity to other uses of land that might complement a particular use.

Gaining physical access from the public road can be quite costly, especially if flat land has been produced on a ridge top and the road runs in a valley at the base of the ridge. Access to public utilities is an obvious necessity to develop reclaimed sites, and the cost to install utilities will be strongly influenced by location. Access to public sewers, or an adjacent undisturbed area suitable for septic drainfield waste disposal is a necessity, as there are no known technologies for environmentally sound on-site disposal Appalachian terrain (Krebs and Zipper 1989). The limitations of the natural terrain have made reclaimed mine sites indispensable assets to the economic and social expansion of many communities. In numerous cities in central Appalachia, major new commercial and service related facilities have been constructed on reclaimed mine lands in recent years. Previous to construction of the "new lands" with favorable contours for large scale commercial use, these land uses were simply not feasible due to shortages of appropriately located flat land. Throughout Appalachia, many homes have been successfully constructed on reclaimed mine sites (Miller 1978b), as well as schools, hospitals, and recreational facilities (Miller 1976, 1978a, 1983a, 1983b). Where lands can be developed to improve land use, there are income opportunities available to the landowner.

### **Summary**

The steeply sloping terrain of the Central Appalachian Region greatly limits the potential for commercial and industrial development, and restricts the amount and levels of other income producing activities by residents. Coal mining and reclamation, the major income producer and employer in the region, has the capability to create large areas of flat or gently sloping terrain, and can make income-producing opportunities for residents and developers. Postmining land uses which have successfully provided additional income for landowners on more gently sloping reclaimed areas in the region are beef cattle production, Christmas tree plantations, timber production, horticultural crops, and residential, commercial, and light industrial land uses.

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