

CHAPTER A .  
AN EVALUATION OF APPROXIMATE  
ORIGINAL CONTOUR AND POSTMINING  
LAND USE IN VIRGINIA

1. INTRODUCTION

The Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) establishes a program of cooperative federalism that allows states such as Virginia to enact and administer their own regulatory programs within limits established by Federal minimum standards, with oversight authority vested in the Department of the Interior. *See* H.R. Rep. 218, 95th Cong., 1st Sess. at 57 (1977), *reprinted in* 1977 U.S. Code Cong. & Admin. News 593, 595; *Hodel v. Virginia Surface Mining and Reclamation Association*, 452 U.S. 264, 289 (1981). In SMCRA's findings section, Congress provides the following explanation for its decision to offer each state "primary jurisdiction," or "primacy," in this area:

because of the diversity in terrain, climate, biologic, chemical and other physical conditions in areas subject to mining operations, the primary governmental responsibility for developing, authorizing, issuing, and enforcing regulations for surface mining and reclamation operations subject to this chapter should rest with the States[.]

30 U.S.C. § 1201(f).

Primacy does not, however, grant a state absolute authority to regulate surface coal mining without any Federal involvement. Section 503 of SMCRA requires that state rules and regulations be "consistent with regulations issued by the Secretary pursuant to [SMCRA]." 30 U.S.C. § 1253(a)(7). Further, Section 505(b) of SMCRA provides that "[a]ny provision of any State law or regulation . . . which provides for more stringent land use and environmental controls and regulations" than does SMCRA or the Federal rules "shall not be construed to be inconsistent" with SMCRA. 30 U.S.C. § 1255(b).

Because Virginia has a state program approved under Section 503 of SMCRA, *see* 30 C.F.R. Part 946, its actions must be evaluated for consistency with that program. At the same time, however, if it becomes apparent that some aspect of the approved program is inconsistent with SMCRA, it is incumbent upon the Office of Surface Mining (OSM) to address that situation. If, for example, State program provisions are found to be less effective than the Federal requirements, OSM can require the State to amend its program in accordance with 30 C.F.R. § 732.17. In this report, OSM has evaluated the way in which the Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME/DMLR) administers the requirements relating to

approximate original contour (AOC) and postmining land uses associated with mountaintop removal and steep-slope AOC variances for consistency with its approved State program. OSM has also reviewed the State program requirements to determine if they are consistent with Federal requirements.

This report focuses on two issues:

- First, what standard does DMME/DMLR use in evaluating whether a particular postmining land configuration constitutes a return to AOC? This report describes various characteristics of land after mining in terms of elevation changes, creation of valley fills, creation of level sections, and other general descriptive information. The issue is how any of those characteristics, either individually or in combination, are used in determining if AOC has been achieved.
- Second, has DMME/DMLR required appropriate postmining land uses when it grants a waiver from AOC requirements?

In order to evaluate DMME/DMLR's administration of requirements related to AOC and postmining land use and to determine whether Virginia requirements are consistent with SMCRA, the team reviewed 10 permits, 7 of which had AOC variances. The team focused its evaluation on (1) gathering data that might be useful in understanding how AOC is determined in Virginia and determining whether or not DMME/DMLR should modify its method for determining AOC, and (2) determining the appropriateness of the postmining land use when an AOC variance was granted by the State. Some permits involved disturbances initiated early in the permanent program; others involved recent disturbances. The purpose of evaluating older permits was to gain insight into the actual forms of land created after mining and to see if any trends have been established over the years.

In order to review land configuration after reclamation and to evaluate the amount of success in establishing, and the appropriateness of, postmining land uses, the review included examination of two permits in which the bonds have already been released. The team also examined the database the State uses to catalogue mining operations in order to see if it could be used to accurately identify the number of operations fitting the parameters of this study.

## **2. FEDERAL REQUIREMENTS**

### **a. General AOC Requirements**

#### **1. Statute**

Section 701(2) of SMCRA defines "approximate original contour" to mean

that surface configuration achieved by backfilling and grading of the mined area so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the

drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated; water impoundments may be permitted where the regulatory authority determines that they are in compliance with Section 515(b)(8) of this Act.

30 U.S.C. § 1291(2).

Section 515 of SMCRA sets forth environmental protection performance standards applicable to surface coal mining operations. 30 U.S.C. § 1265. Among these standards is the requirement to return the land to AOC—pursuant to Subsection 515(b)(3), mine operators must "backfill, compact . . . , and grade in order to restore the approximate original contour of the land with all highwalls, spoil piles, and depressions eliminated." 30 U.S.C. § 1265(b)(3).

## 2. Legislative History

The legislative history of SMCRA shows that Congress intended to provide considerable flexibility with respect to what surface configuration would satisfy the statutory requirement for AOC restoration. The Committee Report on the House version of SMCRA, which contained the definition of AOC that was enacted into law, stated:

H.R. 2 requires that a mine site be regraded to AOC. Moreover, the regrading standard of H.R. 2 was formulated to cover all types of mining operations under all conditions. Thus it is, of necessity, a flexible standard which contemplates different mining circumstances. The bill's critics have alleged, to the contrary, that the term "approximate original contour" imposes an overly rigid and impractical requirement. It should be emphasized, therefore, that a reasonable interpretation of H.R. 2 cannot justify the assertion that the bill requires either the impossible task of restoration of the original contour or the useless act of digging a pit to obtain fill material to achieve full restoration of the original topography.

H.R. Rep. No. 95-218, at 96 (1977).

Since the enactment of SMCRA, OSM has recognized that, in primacy States, the State regulatory authority has the primary responsibility for interpreting what constitutes AOC at a given mine site during the permitting process. *See* 30 U.S.C. § 1201(f), quoted *supra* in the Introduction.

An important AOC issue, however, is the extent to which a postmining change in land elevation, slope, relief, or configuration constitutes a departure from AOC. Our research into SMCRA's legislative history has indicated that the primary element of AOC is configuration or shape. Although the House Committee Report mentioned both configuration and elevation, it gave primary emphasis to configuration:

As defined in the bill, approximate original contour means:

That surface configuration achieved by backfilling and grading of the mine area so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the draining pattern of the surrounding terrain, with all highwalls and spoil piles eliminated \* \* \*.

The term contour is defined by the dictionary as "the outline of a figure or body, with a line or lines representing such an outline." The contour of ground is similarly defined as the outline of the surface of the ground with respect to its undulations. These two definitions primarily refer to the shape or configuration of a surface. In addition, with respect to mapping, contour takes on an additional meaning; the imaginary line connecting the points on the land surface that have the same elevation and the line representing such line on a map or chart. In order to understand this concept it is necessary to distinguish between the two dimensions of elevation and configuration.

*Id.* at 97.

The Committee went on to give a number of examples of what the Committee meant by AOC. *Id.* at 97-103. In each of these, the emphasis was on configuration as the primary element.<sup>1</sup>

Our examination of the legislative history of SMCRA has disclosed no statements indicating that a change in elevation, by itself, constitutes a departure from AOC. Instead, on several occasions during the debate on SMCRA and its precursors, the bill's sponsors gave assurances that the AOC requirement did not mandate a return to original elevation. Usually, these statements were made in response to charges that a return to AOC, as required by SMCRA, would be impossible. For example, during the floor debate on H.R. 25, a direct precursor of SMCRA, Representative Clausen of California, one of the principal sponsors of the bill, emphasized that AOC did not mandate a return to original elevation:

In addition, the bill requires that lands be returned to the approximate original contour and requires they be covered by vegetation. The land must come as close to resembling its

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<sup>1</sup>The IBLA has since used one of these examples to rule that a postmining increase in elevation due to the swell of spoil material does not constitute a departure from AOC. *Pacific Coast Coal Co., Inc.*, 118 IBLA 83 (1991).

premining appearance as possible. It is important to point out that this requirement is *not intended to require restoration of mined lands to their original elevation, but to a similar configuration.*

121 Cong. Rec. 6676, 6686 (March 14, 1975)(floor debate on H.R. 25) (emphasis added).

During the same debate, Congressman Ruppe of Michigan, who played a key role in SMCRA's enactment, also emphasized that it did not mandate a return to original elevation:

However, we plainly realize that the lands which will be mined vary in terms of their physical characteristics, and as a result we have provided rational flexibility. We do not mandate that the mined land be returned to exactly the same shape as it was prior to mining. What the committee has obliged operators to do is to return the land to its "approximate original contour." *It should be emphasized here once again, as I have attempted to do many times in the past, that "approximate original contour" does not mean that the land must be returned to original elevation.* This would be patently ridiculous in the case of a thick seam of coal covered by a relatively thin stratum of overburden. When this coal is mined, it will create a depression that could not be returned to the original elevation without hauling an enormous amount of materials from some other location, thereby creating a similar depression elsewhere. Therefore, the committee bill requires that the coal operator regrade the mined area inside and around the perimeter of the mined area so that the depression blends into the surrounding terrain, and that within the mined area, the surface of the land "closely resembles" its premining configuration.

*Id.* at 6888. See also Additional Views of Cong. Ruppe, Clausen, and Lagomarsino, H.R. Rep. No. 94-45, at 152 (94th Congress, 1st Sess. 1975) ("First, approximate original contour as it applies to thick seam area mining in the West is not intended to require that the mined site be returned to its original elevation. Original elevation simply often cannot be obtained. . . . It must be emphasized that the requirement to return to approximate original contour does not necessarily mandate the attainment of original elevation."); 120 Cong. Rec. 23650, 23659 (July 17, 1974) (floor debate on H.R. 11500, another SMCRA precursor); ("Now approximate original contour does not mean original elevation or that every bump on the landscape must be restored.").

While this legislative history is helpful, much of it focuses on thin and thick overburden situations, rather than mountaintop removal and steep-slope mining operations, and it does not clearly state what a regulatory authority must consider when making AOC determinations. Subsection 515(b)(3) of SMCRA specifically exempts thin and thick overburden situations from the requirement to restore the AOC.

### 3. OSM's Treatment of AOC in Rules

In its national regulations and in approving individual State programs, OSM adopted the statutory definition of AOC essentially unchanged. In the development of national regulations, the only discussion of elevation change in relation to AOC is in the preamble to the rules regarding thick or thin overburden. The permanent program rules promulgated in 1979 defined thin overburden as overburden where the final thickness is less than 0.8 times the initial thickness and thick overburden as overburden where the final thickness is greater than 1.2 times the initial thickness. The preamble stated:

The definition of approximate original contour states that the reclaimed area should closely resemble the general surface configuration of the land prior to mining. OSM interprets this to mean that the approximate original contour, or configuration, of the premining land is intended, and minor changes in elevation are anticipated.

44 Fed. Reg. 15231 (March 13, 1979).

Thus, an elevation change of plus or minus 20 percent was accepted as AOC in those rules.

In 1983, those numerical limits were deleted from the thick and thin overburden rules. *See* 48 Fed. Reg. 23356, 23365 (May 24, 1983). In 1988, the D.C. Circuit upheld the remand of those rule changes because the Secretary had failed to explain his reasons for removing the numerical limits. *National Wildlife Federation v. Hodel*, 839 F.2d 694, 734 (D.C. Cir. 1988). In 1991, OSM again published rules addressing thick and thin overburden. The preamble contains cross sections showing elevation changes of greater than plus or minus 20 percent that would still be considered AOC. With this rule OSM declined to set a numerical limit and asserted that the issue was best left to the state regulatory authority. *See* 56 Fed. Reg. 65629-95633 (December 17, 1991).

In 1987, OSM issued Directive INE-26 (see Appendix II) to provide guidance to OSM field personnel in evaluating AOC issues during oversight. The Directive makes three points with respect to AOC. First, because both the permittee and the regulatory authority (as well as other interested parties) need a clear understanding prior to mining of what the final postmining topography will be, the anticipated postmining topography must be determined in the permitting process to enable a determination of whether AOC will be achieved. Second, inspections should ensure that the approved postmining topography is being reasonably achieved, including general surface configuration, drainage, and elimination of highwalls and spoil piles. Third, in oversight, considerable deference should be given to prior decisions by the State, particularly where the final grade work has been done. In recognition of the emphasis that the 1987 Directive places on the role of the permitting process in applying AOC requirements to specific operations, the current review looked to see what DMME/DMLR was accepting as meeting AOC requirements in the permitting process. (See page A-18 for further discussion of the findings.)

## **b. Federal Requirements Relating to Mountaintop-Removal Mining Operations**

Section 515 of SMCRA contains specific performance standards for mountaintop removal mining. Subsection 515(c) permits an exception to the AOC restoration requirement for mountaintop removal operations which, after reclamation, would be capable of supporting specific postmining land uses. In such operations, instead of restoring the site to approximate original contour, the operator removes the entire coal seam or seams running through the upper fraction of a mountain, ridge, or hill, by removing all of the overburden and creating a level plateau or a gently rolling contour with no highwalls remaining. 30 U.S.C. § 1265(c). Subsection 515(c)(3) lists the allowable postmining land uses: "industrial, commercial, agricultural, residential or public facility (including recreational facilities) use[s]." 30 U.S.C. § 1265(c)(3). In demonstrating the feasibility and practicability of the proposed postmining land use, the applicant must include specific plans and show that the use will be:

- (i) compatible with adjacent land uses;
- (ii) obtainable according to data regarding expected need and market;
- (iii) assured of investment in necessary public facilities;
- (iv) supported by commitments from public agencies where appropriate;
- (v) practicable with respect to private financial capability for completion of the proposed use;
- (vi) planned pursuant to a schedule attached to the reclamation plan so as to integrate the mining operation and reclamation with the postmining land use; and
- (vii) designed by a registered engineer in conformance with professional standards established to assure the stability, drainage, and configuration necessary for the intended use of the site.

30 U.S.C. § 1265(c)(3)(B).

Federal regulations pertaining to mountaintop removal operations are found at 30 C.F.R. § 785.14 and Part 824. The regulations generally track the language of SMCRA, but do clarify the applicable requirements in the following respects:

- A requirement for compliance with the alternative postmining land use provisions of 30 C.F.R. § 816.133(a) through (c) [30 C.F.R. § 824.11(a)(4)];

- A specification that final graded slopes on the plateau portion of the operation not exceed 1v:5h (20%) [30 C.F.R. § 824.11(a)(7)];
- A requirement that plateau outcrops attain a minimum static safety factor of 1.5 or that they not exceed 1v:2h (50%) [30 C.F.R. § 824.11(a)(7)];
- A requirement that the resulting level or gently rolling contour be graded to drain inward from the outslope [30 C.F.R. § 824.11(a)(8)]; and
- A clarification that the prohibition on damage to natural watercourses applies only to watercourses below the lowest coal seam to be mined [30 C.F.R. § 824.11(a)(9)].

### **c. Federal Requirements Pertaining to Steep-Slope Mining Operations**

Subsection 515(d) of SMCRA specifies additional requirements for "steep-slope surface coal mining." The term "steep slope" is defined at Subsection 515(d)(4) as "any slope above twenty degrees or such lesser slope as may be defined by the regulatory authority after consideration of soil, climate, and other characteristics of a region or State." 30 U.S.C. § 1265(d)(4). When mining on such slopes, the operator may not place spoil, abandoned or disabled equipment, debris or waste materials downslope below the bench or mining cut; the operator may not disturb the land above the top of the highwall unless it is found that such disturbance will facilitate compliance with the Act's environmental protection standards; and the operator must completely backfill with spoil material to "cover completely the highwall and return the site to approximate original contour . . ." 30 U.S.C. § 1265(d).

As provided in Subsections 515(e)(1) and (e)(2) of SMCRA, a variance from AOC for a steep-slope mining operation is allowed if the owner of the property requests it in writing as part of the permit application; the watershed control of the area is improved; the potential use of the affected land is deemed to constitute an "equal or better economic or public use;" and the proposed use is designed and certified by a qualified registered professional engineer in conformance with professional standards established to assure the stability, drainage, and configuration necessary for the intended use of the site. 30 U.S.C. § 1265(e)(1) and (e)(2). Subsection 515(e)(2) further specifies that these variances from AOC must be for operations that will render the land suitable, after reclamation, "for an industrial, commercial, residential or public use (including recreation facilities)." 30 U.S.C. § 1265(e)(2).

The Federal regulations relating to steep-slope mining operations are found at 30 C.F.R. §§ 785.15, 785.16, 816.107/817.107, and 816.133(d)/817.133(d). The regulations generally track the language of SMCRA, but do clarify the applicable requirements for steep-slope mining operations receiving a variance from AOC requirements:

- Steep-slope mining operations receiving a variance from AOC must comply with the alternative postmining land use provisions of 30 C.F.R. §§ 816.133(c) and (d) and 817.133(c) and (d) [30 C.F.R. §785.16(a)(2)];

- The watershed of lands within the proposed permit and adjacent areas will be improved by the steep-slope mining variance operation if the amount of total suspended solids or other pollutants discharged into surface or ground waters will be reduced or if flood hazards within the watershed will be diminished by a reduction in peak flow discharges; the total volume of flow will not vary in a way that adversely affects surface waters or any existing planned use of surface or ground water; and the appropriate State environmental agency approves the plan [30 C.F.R. § 785.16(a)(3)];
- All highwalls must be completely eliminated with spoil material in a manner which results in a static safety factor of at least 1.3 [30 C.F.R. §§ 816.133(d)(7) and 817.133(d)(7)]; and
- Only that amount of spoil necessary to achieve the postmining land use and ensure the stability of the retained spoil may be placed off the mine bench [C.F.R. §§ 816.133(d)(8) and 817.133(d)(8)].

#### **4. STATE PROGRAM REQUIREMENTS**

##### **a. General AOC Requirements**

Virginia law requires, with certain exceptions, that mined lands be returned to AOC. Subsection 45.1-229 of the Virginia Coal Surface Mining Control and Reclamation Act (VCSMCRA) essentially repeats the SMCRA definition of AOC. The exceptions, *i.e.*, formal variances from AOC, are addressed in Subsection 45.1-242(C) of the VCSMCRA. Table A-1 contains a summary of the State's requirements relating to AOC and the variances that are allowed under the Virginia approved program.

During the permitting process, applicants must identify the premining and postmining topography and indicate whether they are requesting a variance from AOC. Depending on the mining plan, operators in steep-slope areas (greater than 20 degrees) can obtain either a permit for mountaintop removal mining, or a permit containing a steep-slope AOC variance.

##### **b. State Requirements Relating to Mountaintop-Removal Mining Operations**

Subsection 4 VAC 25-130-785.14 of the Virginia Coal Surface Mining Reclamation Regulations (VCSMR) provides that an AOC variance may be granted for the surface mining of coal, "where the mining operation will remove the entire coal seam or seams running through the upper fraction of a mountain, ridge, or hill . . . by removing all of the overburden and creating a level plateau or a gently rolling contour with no highwalls remaining and capable of supporting [*certain*] postmining uses . . ." (emphasis added).

TABLE A-1

Virginia PROVISIONS	Approximate Original Contour (AOC) Restoration	Mountaintop Removal AOC Variance	Steep Slope AOC Variance
Premining topographical eligibility requirements	None. Standard applies universally in absence of variance.	Mountain, ridge, or hill	Average slopes in excess of 20 degrees
Postmining topographical requirements	Must closely resemble general premining surface configuration	Level or gently rolling inward-draining plateau	No specific requirements (dependent upon land use and terrain)
Surface owner consent to proposed postmining topography	Not required, but owner must be consulted on postmining land use	Not required, but owner must be consulted on postmining land use	Required
Acceptable postmining land uses	Premining or higher or better uses (uses with higher economic value or nonmonetary benefit to landowner or community)	Industrial, commercial, agricultural, residential, or public use (including recreational facilities)	Industrial, commercial, residential, or public use (including recreational facilities)
Implementation requirements for approved postmining land use	None (must be capable of supporting approved use)	Integrated with mining	None (must be capable of supporting approved use)
Special hydrologic requirements	None	Must not damage natural watercourses	Must demonstrate that watershed will be improved
Required static safety factor	1.3	1.5	1.3
Amount of overburden that may be placed outside mined-out area	Limited to excess spoil and spoil required for blending with surrounding terrain	No restrictions apart from requirement to retain enough on bench to achieve postmining land use	Limited to amount necessary to achieve postmining land use and ensure stability
VCSMRR	4 VAC 25-130-816/817.102,104,105	4 VAC 25-130-785.14; 824.11; 816.133	4 VAC 25-130-785.15,16; 816/817.107,133

As illustrated in table A-2, the allowable postmining land uses for mountaintop removal operations approved under the Virginia program include:

- industrial,
- commercial,
- agricultural,
- residential, or
- public facility (including recreational facilities.)

TABLE A-2

<i>Approvable Postmining Land Uses in Virginia</i>							
Mining Type	A	B	C	D	E	F	G
Mines w/o AOC Variance	X	X					
Steep-Slope Mines w/AOC Variance*			X	X		X	X
Mountaintop Removal Mines*			X	X	X	X	X
A. Premining Use B. Equal or Better Economic or Public Use C. Industrial D. Commercial				E. Agricultural F. Residential G. Public Use			
*Must also constitute an equal or better use							

Pursuant to § 4 VAC 130-785.14(c) of the VCSMCRR, the State may grant a permit with a mountaintop removal mining variance only after finding the following:

- the proposed postmining land use of the lands to be affected will be an industrial, commercial, agricultural, residential, or public facility (including recreational facilities) use:

- the proposed postmining land use constitutes an “equal or better use;”
- the proposed use will be compatible with adjacent land uses and existing land use plans;
- local, State, and Federal agencies have been provided an opportunity to comment on the proposed land use;
- the applicant demonstrates compliance with the requirements for acceptable alternative postmining land uses of Paragraphs (a) through (c) of § 4 VAC 25-130-816.133; and
- the application contains specific plans and assurances that the proposed use will be (1) compatible with adjacent land uses; (2) obtainable according to data regarding expected need and market; (3) assured of investment in necessary public facilities; (4) supported by commitments from public agencies where appropriate; (5) practicable with respect to financing and completing the proposed use; (6) planned pursuant to a schedule that will integrate the mining operation and reclamation with the postmining land use; and (7) designed by an approved person to assure the stability, drainage, and configuration necessary for the intended use of the site.

#### **c. State Requirements Pertaining to Steep-Slope Mining Operations**

Subsections 4 VAC 25-130-785.15 and 16, and 4 VAC 25-130-816/817.107 of the VCSMCRR contain requirements governing steep-slope mining. The term “steep slope” is defined at § 4 VAC 25-130-700.5 as “any slope of more than 20 degrees or such lesser slope as may be designated by the division after consideration of soil, climate, and other characteristics of a region or State.” When mining on such slopes, no spoil, abandoned or disabled equipment, debris or waste materials may be placed on the downslope; the operator may not disturb the land above the top of the highwall unless it finds that such disturbance will facilitate compliance with the environmental protection standards of the subchapter; and woody materials may not be placed in the backfill unless it will not affect stability of the backfill. Virginia’s program also requires that highwalls be eliminated and the site be returned to AOC unless a variance is granted, or previously mined lands are involved and insufficient spoil exists to return the site to AOC.

State regulations at § 4 VAC 25-130-785.16 provides that DMME/DMLR may issue a permit with a variance from AOC for surface mining on slopes greater than 20 degrees when the watershed of the area is improved and all backfilling and grading is completed with all highwalls eliminated. The State may grant a variance from the requirements for restoring mined lands in steep-slope areas to AOC only if:

- the permit area is located on slopes that exceed an average of 20 degrees;
- all highwalls are completely backfilled in a manner which results in a static safety factor of 1.3;
- only that amount of spoil necessary to achieve the postmining land use and ensure the stability of the retained spoil may be placed off the mine bench;
- the watershed of the permit area and adjacent areas will be improved by reducing the discharge of pollutants to ground and surface waters and by reducing flood hazards;
- appropriate Federal, State, and local governmental agencies have been provided an opportunity to comment on the proposed postmining land use and have deemed it to be "equal or better economic or public use;"
- the proposed use is designed and certified by a registered professional engineer to assure stability, drainage, and configuration necessary for the intended use of the site; and
- the landowner has requested in writing that a variance be granted to achieve the proposed alternative postmining land use.

## 5. REVIEW METHODOLOGY

Beginning in 1997, the public and media began to focus increasing attention on "mountaintop removal operations" in West Virginia and Kentucky. Commonly understood, the term "mountaintop removal" refers to any operation that removes all or part of the top of a mountain or ridge and places the overburden or excess spoil resulting from the removal into fills. This common usage can lead to confusion because, as defined in SMCRA, the term "mountaintop removal" refers only to one specific type of mining operations conducted in mountainous areas. This report will use the broader term "*mountaintop operations*" to refer generally to mining operations that remove all or part of a mountain or ridge. This report will use the narrower term "*mountaintop removal (AOC variance) operations*" in its legal SMCRA sense (see category #1 below).

Three types of mining practices are included in the term "mountaintop operations" for this evaluation. These types are:

1. "Mountaintop removal (AOC variance) operations" - Mines which remove all of the coal seam or seams in the upper fraction of a mountain or ridge and request a mountaintop removal variance from AOC restoration requirements. Only this kind of operation constitutes a mountaintop removal mine as defined in the State and Federal regulations.

2. Mines (area mines) which remove all of the coal seam or seams in the upper fraction of a mountain or ridge and return the land to AOC.
3. Mines in steep slope areas (slopes exceeding 20 degree) that do not remove all of the coal seam in the upper fraction of a mountain or ridge and may or may not have a variance from AOC.

For ease of reading we will refer to all mountaintop removal mining with an AOC variance as *mountaintop removal operations* and similar sites without an AOC variance as *area mines*. For the remainder of this report, *steep slope* mining identifies sites in topography with slopes greater than 20 degrees which may or may not have an AOC variance and the term will be used with other descriptive terms (e.g., steep slope mines with/without an AOC variance).

Notwithstanding regulatory definitions, OSM recognizes that the public's concern in other states is not confined to any one of these mining scenarios, but encompasses all three. Accordingly, this report addresses all three types of mines.

Chart A-1 (Page 15) shows the number and types of mining operations currently occurring in Virginia. Chart A-2 (Page 16) shows the current permitted acreage by mining and/or variance type. Comparatively these charts show the number of ongoing mountaintop removal (6); surface mines with steep slope AOC variances (5); underground mines with steep slope AOC variance (22); and other steep slope AOC variance mining operations (5), such as preparation plants and fill areas, in relation to all mining operations (681). As can be seen from these charts mountaintop removal operations account for less than one percent of all mining and three percent of the permitted acreage. Steep slope mining sites with AOC variances account for four and a half percent of all mining permits and four percent of the total permitted acreage. Because most variance areas do not encompass the entire permit, our study found that the variances applied on average to about half of the individual permit or about four percent of the all of the permitted acreage in Virginia.

#### a. Site Selection

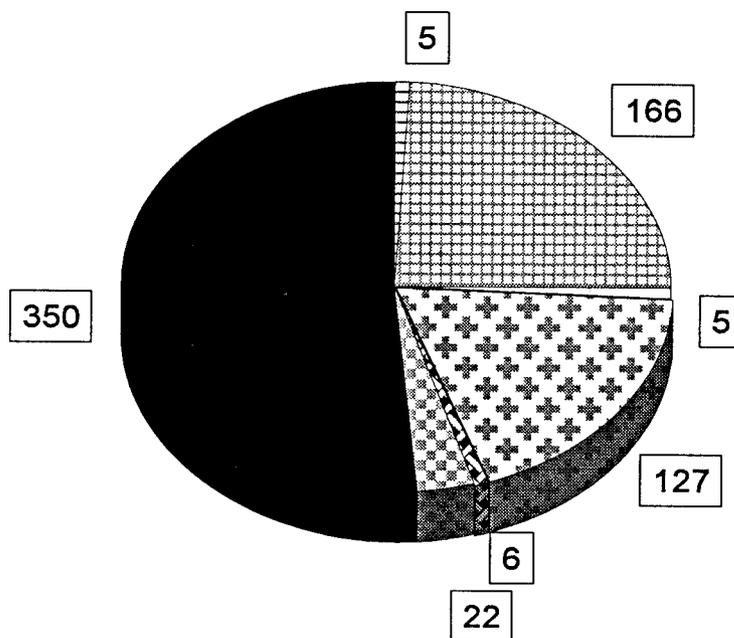
OSM and DMME/DMLR established a team to conduct this evaluation. OSM team members reviewed a list of sites provided by DMME/DMLR and selected a sample. Appendix IV contains a copy of the State listings from which the selections were made. The team selected ten site from the following categories in order to evaluate the three types of mining practices mentioned above:

- three (of six) mountaintop removal operations;
- two (of thirty-two) steep slope mines with AOC variances;
- three (of unknown total) steep slope mines restored to AOC; and
- two (of unknown total) mountaintop removal permits in which the bond has been released.

Table A-4 ( Page A-21) lists the sites selected for review by permit number and mining category.

# Mine Types

## Number of Permits



-  Surface (166)
-  Surface with Steep Slope AOC variance (5)
-  Underground (350)
-  Underground with Steep Slope AOC Variance (22)
-  Mountaintop Removal Mining (6)
-  Other (includes preparation facilities, fill areas, etc.) (127)
-  Other with Steep Slope AOC Variance (includes prep plants, fills, etc.) (5)

Chart A-1

# Acres

Hundreds of Acres

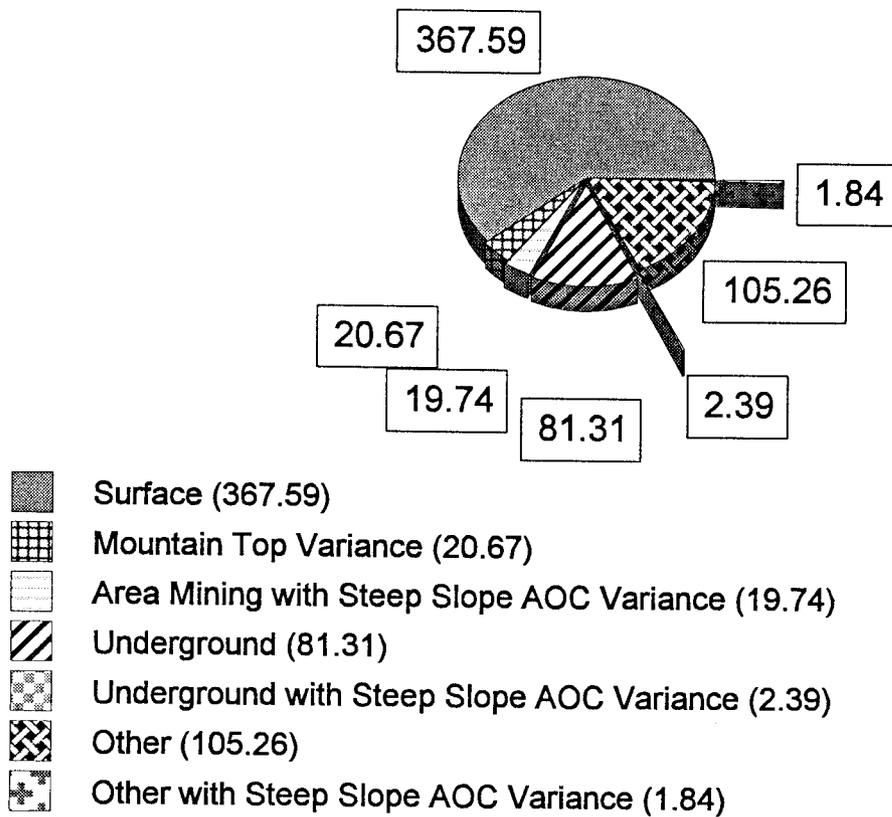


Chart A-2

## **b. Work Plan**

The team members conducted both permit reviews and field investigations. The team also analyzed the statistics and prepared this report.

In evaluating operations which had been granted mountaintop removal or steep slope AOC variances, the team reviewed permit documents to determine whether or not permit applicants had satisfied all State program requirements relating to mountaintop removal or AOC-variance approvals, and postmining land use changes. In evaluating operations where the site was to be returned to AOC, the team reviewed permit files to determine how the approved mining maps and plans documented compliance with State AOC variance provisions and, if applicable, with alternative postmining land use requirements.

The team conducted field investigations on all active sites selected for this study. Because our right of entry authority expires with the termination of jurisdiction at bond release, we did not conduct on-site field inspection on the two bond released sites. Each permit was examined to determine whether the final surface configuration of the permit area was consistent with the approved permit and whether or not its (alternative) postmining land use was in development or had been achieved according to the plans and schedule required by the approved State program. In addition to the inspection criteria listed above, field investigations sought to ascertain which site conditions DMME/DMLR generally views as constituting "AOC." Review team members photographed each site to illustrate current conditions. The team obtained a representative cross section of premining land configuration from each permit package and a postmining land configuration was determined using a global positioning system (GPS) survey. Chapter B of this report shows both the cross sections and the photographs the review team compiled for seven of the ten sites.

In general, the review team gathered descriptive information to assess how the State has been implementing the AOC restoration requirement. This information included:

- descriptions of elevation changes;
- excess spoil calculations;
- photographs of the site and the surrounding area;
- typical cross sections showing premining and postmining topography;
- comparisons of postmining drainage patterns, as obtained from field observations, with documented premining drainage patterns; and
- general descriptions of each mining operation based on permit and inspection documents.

This information was used to document the conditions that the Virginia regulatory authority regards as constituting postmining AOC and to evaluate differences, if any, between the final

configuration of sites with AOC variances and those without AOC variances. Appendix I contains a copy of the performance agreement between DMME/DMLR and OSM. Appendix V contains a copy of the evaluation form used by the team.

## 6. FINDINGS AND ANALYSES

### a. Approximate Original Contour (AOC)

In order to facilitate a more comprehensive understanding of State implementation of the AOC requirement, the team gathered information beyond what might normally be collected by OSM in reviewing State AOC decisions. For example, rather than only verifying that the State followed a reasonable process in making its determination and that the on-the-ground reclamation conformed to the permit, the team developed its own descriptions of the site including cross sections, photographs, *etc.* to facilitate an overall understanding of what is considered as AOC within the State. Tables A-4 and A-5, pages A-21 and A-23 respectively, as well as Chapter B of this report, provide descriptive information about all the sites evaluated.

Excavated material swells because of the creation of voids during mining. The swell factor is one of the elements considered in estimating the number and size of fills needed to conduct an operation. Table A-5 shows that not all of the permit applications that were reviewed contained information regarding swell factors and the amount of predicted excess spoil to be placed in fills. While there is no specific numerical requirement in the regulations relating to swell factor, the permit applications should contain information regarding spoil calculations and the amount of excess spoil to be placed in fills. This information may be a good indicator of the degree to which an operation proposes to use available material to reach AOC.

To evaluate how DMME/DMLR is making AOC determinations, the team compared operations that return(ed) the land to AOC to those granted variances from AOC. The team made the following observations:

- Both sites with and sites without AOC variances sustained comparable gains or reductions in elevation. Sites returned to AOC had maximum elevation changes ranging from -50 to -140 feet with an average change of -31 feet. See Table A-4 on page A-21. Sites with a variance from AOC had maximum elevation changes of +20 feet to -140 feet with an average change of -26 feet. Final grading plans for some sites that were to be returned to AOC differed little from those for sites that had AOC variances. As illustrated by the data for each permit (Chapter B), both sites with AOC variances and sites that were to be returned to AOC have resulted in similar postmining land configurations.
- Table 5 shows that both sites with and sites without AOC variances required excess spoil disposal fills. Previously mined benches or valley fills hold the excess spoil not needed to achieve AOC, or for those sites with an AOC variance, the spoil not needed to achieve the approved postmining land use. Permittees proposed using an average of 3 fills (range of 0-10) per permit and our study found that, on average, 2 fills (range 0-6) were constructed.

- On average, our observations showed that on sites returned to AOC, the amount of excess spoil proposed for disposal in fills was less than the predicted excess spoil from swell (16 percent fill v. 30 percent swell). On non-AOC sites, average spoil disposal volumes exceeded predicted swell volumes (35 percent fill v. 32 percent swell). Overall, 70 percent of the permits sampled placed less spoil in excess spoil fills than had been predicted based on swell. As table A-5 (Page 23) shows, the percentage of the total spoil volume proposed to be placed in fills ranged from 2 to 83 percent for sites with AOC variances and between <1 and 39 percent for sites without AOC variances. On average, our study found that 83 percent of the total spoil predicted to be generated by mining is proposed to be returned to the mined out area or re-mined area, and 17 percent is proposed for excess spoil disposal.
- There were no significant changes in general drainage patterns for any site. (See table A-4). In other words, there was no visible significant redirection of runoff from one drainage area or watershed to another.
- During the permitting process, no other agencies or members of the public objected to the State's determination that the sampled sites, if mined and reclaimed in accordance with the permits, would meet the AOC requirement.

## KEY TO COLUMNS IN TABLE A - 4

***Selected Sites***-- Permit numbers for sites in the evaluation.

***Entire Coal Seam Removed Y/N***--This column indicates if the mining operation removed at least one entire coal seam in the upper fraction of a mountain, ridge, or hill. A multiple seam operation would not have to remove all seams being mined to receive a **Yes (Y)** in this column.

***Stated Mining Type***--This column lists the mining types found in the permit application. Note from the next column that mountaintop (mnttop) does not always include a waiver indicating an AOC variance was requested making it a mountaintop removal in the regulatory sense.

***Requested AOC Variance Type***--

**SS**--The permit was approved with a steep-slope AOC variance.

**MTN**--The permit was approved with a mountaintop removal variance.

**N**--No variance was approved. The site is to be returned to AOC.

***Premining Land Use***--Existing land use as described in the permit.

***Postmining Land Use***-- Land use to be attained after mining according to the permit.

***Largest Elevation Change***--The team calculated elevation change by comparing the current elevations, obtained from Global Positioning System (GPS) technology, of graded and disturbed areas with the premining contours obtained from the permit application. Representative cross-sections of current conditions were field located as close as possible to the cross-sections contained in the original permits. See Chapter B for cross sections and photographs. Each measurement was recorded as a negative or positive gain and then averaged accordingly.

***Average Elevation Change***--This is the average gain or reduction in elevation taken from representative cross-sections developed from premining contours and a field survey of disturbed and graded areas using GPS technology. Measurements were taken as follows:

Scale 1"=50' - every 25'      Scale 1"=200' - every 100'      Scale 1"=400' - every 200'.

Each measurement was recorded as a negative or positive gain and then averaged accordingly.

***Run-Off Direction***--This column indicates whether there was a major redirection of run-off from or drainage to another watershed caused by a change in contours from premining to postmining.

TABLE A-4

<i>Characteristics of Sites Selected for Review</i>									
Selected Sites	Entire coal seam removed Y/N	Stated Mining Type	Requested AOC Variance (Type)		Premining Land Uses	Postmining Land Uses	Largest Elevation Change <sub>feet</sub>	Ave. Elev. Change <sub>feet</sub>	Run-off Pattern Changed (Y/N)
			Y/N	SS/MTN					
1100321	Y	Mntop	Y	MTN	Forestland	Agricultural	-140**	-95**	N
1101115	N	Contour	Y	SS	Forestland/ previously mined land]	Agricultural	-80	-45	N
1101308	Y	Mntop/Contour /Auger	Y	MTN	Forestland/ /previously mined land	Agricultural	-50**	-8**	N
1101352	Y	Mntop/Contour /Auger	Y	MTN	Forestland/ Agriculture/ Previously mined land	Forest/Agricultural	-110	35	N
1101521	N	Contour & auger	N		Forestland	Forestland /Industrial	-50	-16	N
1101548	Y	Area/Mntop/Co ntour	N		Forestland/ previously mined land	Forestland	-140	-45	N
1101556	Y	Mntop/ Contour/ Auger	Y	MTN	Forestland/ previously mined land	Fish & Wildlife	N/A*	NA*	N
1101602	Y	Mntop	Y	MTN	Agricultural/ Forestland	Agricultural	-100	-52	N
1201133	N	Underground	Y	SS	Forestland	Industrial	20	8	N
1601519	Y	Area	N		Forestland/ Previously mined land	Agriculture/ Forestland	-60	-32	N
* Variance area was never mined									
** Data taken from the permit package for these permits. GPS data not available for these sites.									

## KEY TO COLUMNS IN TABLE A - 5

**Selected Sites**-- Permit numbers for sites in the evaluation listed in chronologically according to the date of the original application, with the last two digits representing the year received.

**Permit Size**--The size in acres of the area covered by the listed permit.

**AOC Variance Y/N**--This column indicates if the permit as issued included a variance from the requirement to reclaim to AOC. A (Y) in this column means the permit was approved with either a mountaintop removal or steep-slope AOC variance.

**Premining Overburden**--This is the volume, in million cubic yards, of materials overlying the coal seam(s) prior to mining. This volume includes the volume of materials between coal seams for multiple-seam operations. Unless noted, the volume is "in-place" volume, not for broken or loose material.

**Predicted Swell**--This column lists the predicted increase in the volume of material resulting from the breakage or loosening of the overburden, in percentage and volume terms. The "swell" of material is a function of the type of rock and the method of breaking or loosening. The volume of material indicated in this column plus the premining overburden volume is roughly equivalent to the volume of "spoil" that must be placed back on the mined area or into excess spoil disposal sites, usually valley or durable rock fills in Virginia.

**Total Spoil Generated by Mining**--The total loose volume of material generated in the mining process of breaking up and the material (overburden) above the coal seam for removal.

**Proposed Fill**--This column lists the portion of the total spoil material which was not going to be placed on the mined area and that was proposed to be placed in fills, in both percentage and volume terms.

**Number of Fills**--This is the number of fills into which the proposed fill volume was to be deposited versus those actually constructed.

**NA**--No data available.

TABLE A-5

<i>Fill Data for Sites Selected for Review</i>							
Selected Site	Permit Size (acres)	AOC Variance Y/N	Premining Overburden (Millions Cubic Yards)	Predicted Swell (Percent/MCY) <sup>1</sup>	Total Spoil Generated by Mining (MCY) <sup>1</sup>	Proposed Fill (Percent/MCY) <sup>1</sup>	Number of Fills Proposed/Constructed
1100321	156.90	Y	8	54%/ 4.3	12.3	83% / 10.2	1/1
1101115	109.27	Y	NA	NA / NA	NA	NA / NA	0/0
1101308	339.30	Y	52.7	30%/ 15.8	68.5	4% / 2.9	3/3
1101352	658.60	Y	59.0	12% / 7.1	66.1	2% / 1.2	3/3
1101521	258.60	N	20.3	35% / 7.2	27.5	8.4% / 2.3	10/6
1101548	230.16	N	23.7	25% / 5.9	29.6	38.5% / 11.4	3/3
1101556	363.10	Y	31.4	30% / 9.4	40.8	24% / 9.8	5/3
1101602	240.00	Y	7.4	25% / 1.9	9.3	62% / 5.8	4/3
1201133	13.27	Y	.002	NA / NA	NA	.008	1/1
1601519	226.60	N	6	30% / 1.8	7.8	0.9% / .07	1/1
* NA = No data available				<sup>1</sup> MCY = million cubic yards			

### b. Mine Classification and Inventory

The electronic database currently used by DMME/DMLR to track permits, inspections, and enforcement actions was not created to meet regulatory requirements, but was developed as a means by which State administrators could monitor agency actions and assess program performance.

State officials have acknowledged that the database was never designed to distinguish between the three types of mountaintop operations. For example, State permitting documents and the database use the term "mountaintop" both to describe operations that will, according to their permits, be returned to AOC and to describe operations that will *not* be returned to AOC. The State has completed a manual search and has identified 38 sites having mountain top removal variances or steep slope AOC variances and has agreed to continue to review permits during the next quarter to further refine the list. According to DMME/DMLR officials, recommendations have already been made to modify a new data base that is being developed, and the procedures for operating the data base, to capture additional data. Once the new database goes on-line, data can be entered or updated when the permit is approved or as operators submit future permit applications, modifications, renewals, or revisions.

This updated information will differentiate among the three categories of mines described earlier in this report, *i.e.*, (1) mines which remove all of the coal seam or seams in the upper fraction of a

mountain or ridge and request a mountaintop removal variance from AOC; (2) mines which remove all of the coal seam or seams in the upper fraction of a mountain or ridge and return the land to AOC; and (3) mines in steep-slope areas (slopes exceeding 20 degrees) which may or may not have received steep-slope AOC variances according to State records.

### **c. Observed Postmining Land Uses**

The review team found that the majority of the sampled permits were approved in accordance with postmining land uses in the approved state program for the various mining types. The team identified two permits where inappropriate postmining land uses were approved for the specific type of mining. See Table A-4, page A-21. Although one mountaintop removal operation was approved with a fish and wildlife postmining land use contrary to the approved program, the area for which the variance was granted has not been, and will not be, mined. One of the steep slope AOC variance sites was approved with an agricultural postmining land use. To prevent future approval of an inappropriate postmining land use for an AOC variance permit or mountaintop removal permit, DMLR revised its findings document to list the allowable land uses.

In its review of those permit applications with mountaintop removal and steep slope AOC variances, the team generally found most of the required documentation (see tables A-6 and A-7).

TABLE A-6

<i>Mountaintop Removal AOC Variance Criteria for Sites Selected for Review</i>					
<b>Required Findings</b>	<b>1101352</b>	<b>1101556</b>	<b>1101308</b>	<b>1100321</b>	<b>1101602</b>
The proposed postmining land use constitutes an equal or better use.	Y	Y	Y	Y	Y
The proposed use will be compatible with adjacent land uses and existing land use plans.	Y	Y	Y	Y	Y
County commissions and State and Federal agencies were provided an opportunity to comment on the proposed land use.	Y	Y	Y	Y	Y
<b>The application contains a specific plan and assurances that:</b>					
(1) The proposed postmining land use will be compatible with adjacent land uses.	Y	Y	Y	Y	Y
(2) The proposed use will be practicable with respect to financing and completing the proposed use.	Y	Y	Y	Y	Y
(3) The proposed use will be supported by commitments from public agencies where appropriate.	NA <sup>1</sup>				
(4) The proposed use will be planned pursuant to a schedule that will integrate the mining operation and reclamation with the postmining land use.	Y	Y	Y	Y	Y
(5) The proposed use will be designed by an approved person to assure the stability, drainage, and configuration necessary for the intended use of the site.	Y	Y	Y	Y	Y
(6) The proposed use is obtainable regarding expected need and market data.	(2, 3)	(2, 3)	(2, 3)	(2, 3)	(2, 3)
<p>(1) Not Applicable. Applies to PMLU's requiring public financing or support.  (2) DMME/DMLR accepts a letter from the land owner as the need/market data for low intensity agricultural and residential postmining land uses.  (3) OSM is developing guidance addressing this area.</p>					

TABLE A-7

<i>Steep-Slope AOC Variance Criteria for Sites Selected for Review</i>		
<b>Required Findings</b>	<b>1101115</b>	<b>1201133</b>
The permit area is located on slopes that exceed an average of 20 degrees.	Y	Y
All highwalls are completely backfilled.	Y	Y
Only spoil not necessary to achieve the postmining land use may be removed from the mine bench.	Y	Y
The permitted and adjacent areas will be improved by reducing pollutants to ground and surface waters and flood hazards.	Not found <sup>1</sup>	Not found <sup>1</sup>
Appropriate Federal, State, and local governmental agencies were provided an opportunity to comment on the proposed postmining land use and deemed it to be an equal or better economic or public use.	Y	Y
The plan is designed and certified by a registered professional engineer to assure stability, drainage, and configuration necessary for the intended use of the site.	Y	Y
The landowner requested in writing that a variance be granted to achieve the approved alternative postmining land use.	Y	Y
<sup>1</sup> DMME/DMLR explained that it had not adequately documented the findings but that they had considered this.		

#### **d. Steep-Slope Mining Operations With AOC Variances**

Three of the ten permits in our sample were for operations with steep-slope AOC variances. These were included in the sample because the operations are similar in many respects to mountaintop removal operations and because variances under the approved program may be granted only for specific postmining land uses. One of the sampled sites that had been labeled as steep-slope variance in the State database was found to have a mountaintop removal variance instead. One permit for contour mining removed all coal seams at the end of a ridge in a fashion similar to a mountaintop removal operation. The team members found that one underground mine permit had been returned to AOC even though an AOC variance had been granted. DMME/DMLR's actions in these cases, while questionable, did not result in any environmental harm.

#### **e. Site Reclamation and Utility**

Although this evaluation concentrated on postmining land use and AOC, the oversight team generally observed that the sites were well revegetated after mining and that reclaimed areas appeared stable.

### **7. CONCLUSIONS AND RECOMMENDATIONS**

The team believes that, overall, even though the study has identified a few weaknesses with the administration of particular aspects of the State program, mining operations in Virginia are generally conducted in a manner that protects the environment. Historically, decisions under the State program, such as permitting actions, have been made with public participation, as required in the program, with few questions or concerns having been raised by the commenters. OSM appreciates the interest expressed by DMME/DMLR in reviewing this topic and its assistance in gathering and analyzing data, and in addressing the few regulatory problems revealed.

- In general, OSM agrees that the reforms voluntarily initiated by DMME/DMLR are appropriate, and that existing mining operations, some of which were initially permitted many years ago, should be altered only to the extent practicable. DMME/DMLR has agreed to review all existing permits with variances and apply these reforms to ensure compliance with program requirements. DMME/DMLR will require revisions of any permits or portions thereof that have not been reclaimed in order to ensure that final reclamation leads to an approvable postmining land use. The team does not recommend that any areas that have been regraded or that have established vegetation be disturbed in order to address the concerns raised in this report.

The following is a discussion of our conclusions and recommendations for mines returned to AOC and for mines with AOC variances.

#### **a. Approximate Original Contour (AOC)**

An examination of all mining in Virginia shows that industry usually returns mine sites to AOC rather than obtaining an AOC variance. Our study also shows that while Virginia has no written

guidance for AOC, practical application of the principles has resulted in both variance and AOC sites being returned to a configuration more closely resembling AOC. The team recommends that DMME/DMLR strive for more consistency between permit reviewers in determining when AOC variances are needed.

The permit files for the sampled sites contained no objections from landowners or other interested parties contesting DMME/DMLR's determination that the operations had been designed to restore the approximate original contour.

During the evaluation, the team observed that, in some cases, there is not much difference in the characteristics of mines that have been granted AOC variances and those that are supposed to return the land to AOC. All the sites blend reasonably well with surrounding topography. Contrary to the situation in other states, and because many sites in Virginia have pre-existing benches, Virginia operations generally maintain much more spoil on the bench in both AOC and non-AOC sites. It appears that AOC variances were not required for many of the sites sampled because of this practice.

### **b. Mine Classification and Inventory**

Early on, the review team found that DMME/DMLR's current database was not designed to provide all of the information needed for this study. One of the problems with the current data base is that information pertaining to variances has been entered into the computer at the time the permit application is received and not at the time the permit is actually approved. Another problem is that DMME/DMLR's permitting database has historically classified various mining methods as mountaintop operations regardless of whether an AOC variance had been obtained. These practices have resulted in some sites being improperly classified as mountaintop removal operations, and other sites that were required to obtain variances during the permit review process as not being identified as having variances. DMME/DMLR has responded to these problems by instructing its field inspection staff to verify and supplement the data in its computers. It is currently developing a new tracking system that will classify permits as they are issued or revised. DMME/DMLR's proposed changes to the database and its information collection procedures will enable those using the system to distinguish between the various types of mining operations and variances.

### **c. Mountaintop Removal Mining And Steep Slope Operations With AOC Variances**

Of the ten permits reviewed, seven included mountaintop removal or steep slope variances from AOC. See Table A-4, page A- 21. Most of the land uses associated with these variances related to low intensity agricultural uses such as hay and pastureland. The premining topography on most permits in our sample have naturally occurring flat or gently rolling areas in addition to the steep slopes. Restoration to AOC or near AOC reestablishes the flat or rolling areas for implementing the postmining land use. We did find one mountaintop removal operation with an inappropriate land use but it turned out that the area subject to the variance was never mined. We also found one steep slope operation with an unauthorized land use. DMME/DMLR recognizes these mistakes and is revising its "findings procedures" to eliminate future approval of unauthorized land uses.

#### **d. Permit Documentation**

Except as discussed below, OSM found that all of the mountaintop removal permits with AOC variances contained all of the documentation for approving the designated postmining land use. While the team made a determination of completeness regarding the documentation, it did not attempt to determine the adequacy of the documentation in most cases. The mountaintop removal permits with an agricultural postmining land use were approved using the land owners' request as the "need and market data." DMME/DMLR accepts a letter from the land owner as the need/market data for low intensity agricultural and residential postmining land uses. DMLR is changing this practice and is currently developing guidance to ensure compliance with this section.

In steep slope AOC variance cases, the specific documentation of the finding that watersheds be improved was uniformly absent from permits. DMME/DMLR explained that by approving this variance that it has considered this item and made a positive finding. DMME/DMLR, nevertheless, has already started developing procedures to document this finding in writing.