FEDERAL REGISTER: 48 FR 40140 (September 2, 1983)

DEPARTMENT OF THE INTERIOR
AGENCY: Office of Surface Mining Reclamation and Enforcement (OSM)

30 CFR Parts 701, 816, and 817
Surface Coal Mining and Reclamation Operations, Permanent Regulatory Program; Revegetation

ACTION: Final rule.

SUMMARY: The Office of Surface Mining Reclamation and Enforcement (OSM) is adopting final rules for the revegetation of regraded areas and all other lands disturbed by surface coal mining operations. These final rules are needed to clarify existing rules, minimize duplication, and provide internal consistency. The rules revise requirements for reestablished plant species, planting times, mulching, and revegetation success standards. These changes will facilitate the successful revegetation of mined lands.

EFFECTIVE DATE: October 3, 1983.

FOR FURTHER INFORMATION CONTACT: Arlo Dalrymple, Biological Scientist, Division of Engineering Analysis, Office of Surface Mining, U.S. Department of the Interior, 1951 Constitution Avenue, NW., Washington, D.C. 20240; 202-343-3198.

SUPPLEMENTARY INFORMATION:

I. BACKGROUND

On March 23, 1982 *(47 FR 12596),* OSM published a notice of proposed rulemaking to amend 30 CFR Parts 816 and 817 relating to revegetation of surface coal mining and reclamation operations. Public hearings were scheduled for April 16, 1982, in Washington, D.C.; Pittsburgh, Pa.; and Denver, Colo. The Pittsburgh public hearing date was changed to April 20, 1982 *(47 FR 13535).* No one requested to testify at these hearings. The comment period closed on April 22, 1982. On May 13, 1982, the comment period was reopened for an indefinite period *(47 FR 20631),* and was closed on August 25, 1982 *(47 FR 30266).* The comment period was again reopened, on September 7, 1982, and extended through September 10, 1982 *(47 FR 30266).* During these periods, OSM received written comments from more than 45 commenters representing Federal and State agencies, coal companies, trade associations, environmental groups, and interested citizens.

The provisions of the Surface Mining Control and Reclamation Act of 1977 (the Act), *30 U.S.C. 1201* et seq., which are especially relevant to the rules adopted in this rulemaking are found in Sections 515(b)(2), 515(b)(19), 515(b)(20), and 516(b)(6). Section 515(b)(2) requires the operator, as a minimum, to restore the land affected to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses of which there is a reasonable likelihood.

Section 515(b)(19) of the Act requires the operator to establish, on all affected lands, a "diverse, effective, and permanent vegetative cover of the same seasonal variety native to the area of land to be affected and capable of self-regeneration and plant succession at least equal in extent of cover to the natural vegetation of the area." Section 516(b)(6) imposes a similar requirement for the surface effects of underground mining. Section 515(b)(19) also permits the use of introduced species where desirable and necessary to achieve the approved postmining land use. Section 515(b)(20) of the Act requires the operator to assume responsibility for successful revegetation for either 5 or 10 full years after the last year of augmented seeding, fertilizing, irrigation, or other work to assure compliance with Section 515(b)(19). The 5-year period of responsibility is applicable to areas or regions receiving an annual average precipitation greater than 26 inches, and the 10-year period is applicable to areas or regions where the annual average precipitation is 26 inches or less. An additional pertinent provision, in Section 515(b)(4), requires mine operators to "stabilize and

protect all surface areas including spoil piles affected by the surface coal mining and reclamation to effectively control erosion and attendant air and water pollution."

The rules adopted today govern revegetation to reclaim areas disturbed by surface mining activities, Sections 816.111-816.116, and to reclaim areas disturbed by underground mining activities, Sections 817.111-817.116. The final revegetation rules are identical for surface and underground mining activities. Accordingly, in this preamble Part 816 will be discussed with the understanding that the discussion also applies to Part 817. Specific comments on Part 817 will be addressed separately from those of Part 816. In preparing the final rules and the responses to commenters, OSM has relied upon the Act, the legislative history of the Act, judicial rulings, technical literature, and regulatory operating experience gained under the initial regulatory program.

II. DISCUSSION OF RULES ADOPTED AND RESPONSES TO COMMENTS

A. GENERAL COMMENTS

The comments received on the proposed rules represented a diversity of viewpoints and experiences. Many commenters supported the Department of the Interior's effort to remove what were perceived to be burdensome and redundant rules. These commenters generally thought that the proposed amendments would provide the flexibility necessary to allow result-oriented, cost-effective revegetation, and they supported proposed rules emphasizing performance rather than design criteria. In this regard, a State believed that there are circumstances under which specific design criteria developed at the State level may be beneficial for operators and regulators.

Other commenters expressed concern that the proposed rule changes were a substantial weakening of the previous rules and would undermine the revegetation requirements of the Act and increase the likelihood of revegetation failures. Some of these commenters stated that the proposed rules would leave individual States without guidance when determining minimum acceptable standards for revegetation success.

A commenter said the problems with the proposed rules fell into two categories -- a weakening of rules that ensure revegetation success and a weakening of rules that require operator responsibility for success. The commenter added that the environmental risks of the proposed rules far exceeded any minor cost benefits that might result from the proposed changes. Another commenter thought it a mistake to relax the standards for revegetation prior to any long -- term demonstration of whether the previous performance standards are adequate. OSM was urged to withdraw the proposed rule.

This rulemaking reaffirms OSM's position that the primary responsibility for regulating surface mining and reclamation operations should rest with the States. Federal rules must be capable of nationwide application. The absence of detail in the Federal rules is not a weakening of revegetation requirements but reflects that the rules are designed to account for regional diversity in terrain, climate, soils, and other conditions under which mining occurs. Additional response to these general comments is found in the discussion of the specific comments which follow. Further discussion of the general approach to making the rules more flexible and of replacing design criteria with performance standards is contained in OSM's "Final Environmental Impact Statement OSM EIS-1: Supplement," (FEIS) Volume I, Chapters II and IV.

B. SPECIFIC COMMENTS

SECTION 816.111 - REVEGETATION: GENERAL REQUIREMENTS

The general requirements for revegetation and the use of introduced species were set forth in previous Sections 816.111 and 816.112. OSM is amending these sections by combining the requirements under Section 816.111 and deleting Section 816.112. The purpose of this restructuring is to emphasize the statutory criteria contained in Section 515(b)(19) of the Act and to clarify rules that were perceived to be awkward and confusing.

Proposed Section 816.111 established general requirements for vegetative cover and the use of plant species in mined-land reclamation. It also granted exceptions to these general requirements where the species were necessary to achieve quick-growing, temporary, stabilizing cover, and where cropland was an approved postmining land use. The proposed rule differed from previous Sections 816.111 and 816.112 in that it did not explicitly require the use of field trials to demonstrate that introduced species are desirable and necessary to achieve the approved postmining land use. It

also did not explicitly require the vegetative cover to be capable of stabilizing the soil surface from erosion. The reasons for these proposed changes and other changes of lesser significance were given in the preamble to the proposed rules *(47 FR 12596*, March 23, 1982).

Final Section 816.111 is essentially the same as proposed Section 816.111, with the exception that provisions relating to surface soil erosion and poisonous or noxious species have been added. An explanation of these changes and a section-by-section discussion of all the comments received follows.

SECTION 816.111(a)

Proposed Section 816.111(a) required the operator to establish on all affected land, in accordance with the approved permit and reclamation plan, a vegetative cover that is diverse, effective, permanent, and comprised of species native to the area, or of introduced species where approved by the regulatory authority. The proposed rule also required that reestablished vegetation must be at least equal in extent of cover to the natural vegetation of the area and capable of achieving a productivity level compatible with the approved postmining land use.

One commenter contended that it is inappropriate to mix the procedural aspects of approval of a reclamation plan and the basic performance standards of the Act in one rule. This commenter recommended that the phrase "in accordance with the approved permit and reclamation plan" be deleted from Section 816.111(a) and that new language be added to the rule which would require all revegetation to be in compliance with the approved reclamation plan and the revegetation performance standards. The new language was believed to be needed to make it clear that if the regulatory authority approves a reclamation plan that violates the Act or rules, the operator is not absolved of the responsibility for complying with the revegetation performance standards.

The intent of the phrase in question is to require the operator to follow the revegetation procedures in the permit and reclamation plan that has been previously approved by the State regulatory authority. Generally, an operator's compliance with the permit and reclamation plan would indicate compliance with the Act and the regulatory program. However, if the regulatory authority errs and approves a permit and reclamation plan that violates the Act or rules, the operator is still legally required to comply with the Act and rules. Since Section 816.111(a) is consistent with the result that the commenter seeks, no change has been made in the final rule.

A second commenter asserted that the proposed term "affected land" was not appropriate because it could be concluded that operators would be required to seed temporary topsoil stockpiles, road embankments, and other similarly affected lands. The commenter suggested that the revegetation rules should apply only to the revegetation of areas that have been prepared for permanent revegetation pursuant to previous Sections 816.24 and 816.25 requiring the redistribution of topsoil.

OSM agrees and has substituted the phrase "on regraded areas and on all other disturbed areas" for the phrase "all affected land," to more closely parallel Section 515(b)(19) of the Act, which requires the establishment of vegetation "on the regraded areas, and all other lands affected * * *." However, OSM has adopted the term "disturbed areas" in the final rule, rather than "lands affected." The term "disturbed area" is defined in 30 CFR 701.5 as an area from which vegetation, topsoil or overburden is removed or upon which topsoil, spoil, or waste of various types is placed and is consistent with the term "lands affected" in Section 515(b)(19) of the Act. This new language and that in Section 816.113, which requires planting of disturbed areas after replacement of the plant-growth medium, should be sufficient indication that a permanent vegetative cover need not be established until a disturbed area has been graded and topsoil or topsoil substitutes redistributed under final Section 816.22.

However, operators will often find it necessary to establish a temporary cover of annual and perennial species when there is an extended period between the initial soil-surface disturbance and final grading and replacement of the plant-growth medium. For example, sedimentation ponds and roads may be constructed and used for several years before removal and final reclamation. During this period, sedimentation pond outslopes and road embankments must be protected and stabilized to control erosion effectively as required in Section 816.95(a). The establishment of a temporary vegetative cover is one means of achieving the necessary stabilization of the soil surface.

One commenter stated that the proposed rules were appropriately based upon the Act, which calls for "diverse, effective, and permanent vegetative cover." He added that the explanation of the term "diversity" in the preamble should

be expanded to explain that "diversity" does not necessarily mean that every species and variety of premining grass, shrub, or tree be reestablished or that they be reestablished in identical numbers and ratios after mining.

OSM agrees with the commenter's statement, which is consistent with the definition and explanation of "diversity" contained in the preamble to the proposed rules *(47 FR 12597,* March 23, 1982).

Furthermore, opportunities may exist for improving plant communities by changing the species composition as, for example, establishment of species that change a range site from fair to good condition or that change a noncommercial forest to one that has market potential. In both examples, the new plant community may not contain all the species represented in the original plant community. However, the new plant community is expected to contain species not found, or not found in identical numbers, on the site prior to mining. This interpretation of diversity is consistent with the statutory objective of restoring affected lands to higher and better postmining land uses.

Proposed Section 816.111(a)(2) required the established vegetative cover to be comprised of species native to the area or of introduced species where approved by the regulatory authority. One commenter contended that it was unnecessary to require approval by the regulatory authority since this was implied by the need to establish vegetative cover in accordance with the approved permit and reclamation plan as required by Section 816.111(a) and in compliance with the species provisions in Section 816.111(b).

The use of introduced species in surface mine reclamation presents special problems and risks. The requirement for regulatory authority approval may overlap the provisions identified by the commenter; however, it is retained in the final rules to emphasize the critical evaluation which regulatory authorities will need to make before approving an introduced species that has not been previously field tested for use in mined-land reclamation. A phrase has been added to Section 816.111(a)(2) to make it clear that the regulatory authority may approve the use of the introduced species only where it is desirable and necessary to achieve the postmining land use. This is consistent with Section 515(b)(19) of the Act.

A second commenter believed that State regulatory authorities should be required to consult with wildlife agencies when approving the use of introduced species, to ensure that the species are compatible with resident wildlife populations. The commenter suggested adding language to proposed Section 816.111(a)(2) that would require field-trial demonstrations to document suitability for the proposed postmining land use where there was not sufficient past experience with the species under similar growing conditions.

It is not necessary to require State regulatory authorities to consult with wildlife agencies when approving the use of introduced species. State regulatory authorities may find such consultation beneficial, but it should be left to the discretion of the regulatory authority to determine whether consultation is actually needed. The need for field trials should also be determined by the regulatory authority rather than be required under a Federal rule. Further discussion of introduced species and the use of field trials is found under Section 816.111(b).

Final Section 816.111(a)(3) requires a vegetative cover at least equal in extent to the natural vegetation of the area. A commenter was concerned that the proposed rules were not responsive to situations where forestry is the postmining land use because cover requirements in proposed Section 816.11(a)(3) could be deleterious to maximizing forest growth. The commenter added that if Section 816.111(a)(3) were interpreted in the context of proposed Section 816.111(a)(4), which would have required the achievement of productivity levels compatible with the postmining land use, his concerns would be adequately addressed.

OSM recognizes that extensive ground cover may be incompatible with maximum tree survival and growth since trees and herbaceous plants compete for moisture, nutrients, and light. In situations where the long-term vegetative cover is forest, a light herbaceous cover would be acceptable if it was adequate to protect the soil surface from erosion.

PRODUCTIVITY: Proposed Section 816.111(a)(4) would have required that the reestablished vegetative cover be capable of achieving productivity levels compatible with the approved postmining land use. Two commenters asserted that this provision should be deleted because they could not find any statutory requirement or other justification for the rule. Two state regulatory authorities also commented on proposed Section 816.111(a)(4). Both desired the retention of a productivity provision, but they felt that the phrase "capable of achieving productivity levels" resulted in an ambiguous, imprecise, and poorly demarcated goal which is difficult to measure in the field. One of these commenters maintained that

in order for OSM to fully implement the intent of Section 515 (b)(2) and (b)(19) of the Act, the final rules must focus on premining productivity levels (measured in the field by some actual means) as a primary reclamation standard.

Support for including a productivity requirement in the rules is found in the use of the word "effective" in Section 515(b)(19) of the Act. As Congress stated, effective means "both the productivity of the planted species concerning its utility to the intended postmining land use (e.g., nutritional value for livestock) as well as its capability of stabilizing the soil surface with respect to reducing siltation to normal premining background levels." (H. Rept. No. 95-218, 95th Cong., 1st Sess., p. 106, (1977).)

However, OSM agrees with the commenters in their conclusion that proposed Section 816.111(a)(4) was ambiguous and provided an uncertain standard that may be misleading or redundant of other requirements. For this reason, proposed Section 816.111(a)(4), which was a standard for success, has not been included in the final rule. Final Section 816.116 requires the success of revegetation to be judged on the effectiveness of the vegetation for the approved postmining land use. Whether productivity is included as a measure to ensure that the requirements of Sections 816.116 and 816.111(a)(1) are met depends upon the postmining land use and particular success standard established.

OSM rejects the suggestion that the rule focus on premining productivity levels. OSM agrees that Congress intended that mined land be reclaimed to an equal or better condition than existed prior to mining. In establishing the standards for success of that reclamation, the Act specifically focuses on the extent of the cover of the natural vegetation in the general area and not on premining productivity levels of the specific mined areas. It is anticipated, however, that if the general standards for revegetation are met, the land affected will be returned to a form and productivity at least equal to that of its premining condition.

EROSION CONTROL: Proposed Section 816.111 would have deleted the provision of previous Section 816.111(b)(2), which required the vegetative cover to be capable of stabilizing the soil surface from erosion. OSM proposed this deletion because Section 5 15(b) (19) and (20) of the Act did not explicitly address erosion. Furthermore, rules governing redistribution of topsoil and erosion control appeared to satisfy Section 515(b)(4) of the Act, which requires operators to "stabilize and protect all surface areas including spoil piles affected by the surface coal mining and reclamation operation to effectively control erosion." OSM also pointed out that proposed Section 816.111(a)(3) would require the operator to achieve a ground cover that is equal to or greater than the ground cover that existed prior to mining and that this requirement would in effect provide the reclaimed soils with protection from erosion equal to the protection provided prior to disturbance of the site.

Deletion of the erosion-control requirement was supported by one commenter who said that erosion control was adequately addressed in other sections of the rules, such as previous Section 816.24(b)(3), regarding topsoil redistribution, and previous Section 816.23(b), regarding topsoil storage. Other commenters disagreed and provided comments seeking to retain erosion control provisions in the revegetation rules.

A commenter argued that, in the Southwest, ground-cover standards could be achieved by the establishment of coarse grasses or other plants which do not have erosion-control characteristics equal to the original ground cover. This difference was said to be crucial because most rainfall occurs in violent summer thunderstorms. A commenter noted that there are situations in arid and semiarid areas where the approved postmining land use has slopes steeper than the original slopes and that the restoration of the original extent of plant cover may result in a landscape that is more susceptible to erosion. A third commenter disagreed with OSM's contention that Section 515 (b)(19) and (b)(20) of the Act did not specifically reference erosion control. The commenter noted that these sections require a "diverse, effective, and permanent vegetative cover" and that the word "effective" is defined in House Report 95-218 (95th Cong., 1st Sess., p. 106 (1977)) to mean "both the productivity of the planted species * * * as well as its capability of stabilizing the soil surface with respect to reducing siltation to normal background levels." In the commenter's opinion, this appeared to be a clear directive from Congress that revegetation should at least control erosion to the extent that siltation of surface-water supplies is minimized.

A commenter disagreed with OSM's rationale for deletion of Section 816.111(b)(2) as presented in the preamble to the proposed rules *(47 FR 12597).* No reason for disagreement was provided. The commenter recommended that OSM adopt a new subsection (Section 816.111(b)(5)) that would require vegetative cover capable of significantly minimizing erosion from the soil surface.

The arguments presented by the commenters who sought to retain a provision requiring the vegetative cover to be capable of controlling erosion have merit. OSM acknowledges that an important function of vegetative cover is erosion control and that Section 515(b)(4) of the Act requires operators to stabilize the surface of the soil so as to effectively control erosion. In response to the comments, OSM has adopted a provision in Section 816.111(a)(4) which will require the establishment of a vegetative cover that is capable of stabilizing the soil surface from erosion. Furthermore, a related provision in Section 816.95 (Stabilization of Surface Areas) has also been adopted to address rills and gullies and air and water pollution attendant to erosion *(48 FR 1163,* January 10, 1983). These rules adequately provide the environmental protection from erosion called for by the Act.

SECTION 816.111(b)

Proposed Section 816.111(b) would have required operators to use introduced or native plant species that are desirable and necessary to achieve the approved postmining land use, have the same seasonal characteristics of growth as the original vegetation, and are capable of self-regeneration and plant succession. Also, the reestablished plant species had to be compatible with the plant and animal species of the area and meet applicable State and Federal statutes regulating seed and introduced species. The final rule is essentially the same as proposed, except for the additional requirement that reestablished species must meet statutes regulating noxious and poisonous plants, and that the plant species must be compatible with the approved postmining land use rather than being desirable and necessary to achieve the postmining land use, since some land uses may not depend upon the revegetative cover.

USE OF INTRODUCED SPECIES: Final Section 816.111(b) contains the essential criteria for regulatory authorities to determine whether a species of plant is suitable for surface mine reclamation. These criteria are applicable to both native and introduced species. Regulatory authorities should decide when field trials or other types of documentation are needed to determine if a species meets the requirements of Section 816.111(b). Under this reorganization of the rule, previous Section 816.112 (Revegetation: Use of introduced species) is no longer necessary and has been deleted.

Previous Section 816.112 provided for regulatory authority approval of introduced species when field trials demonstrated that they were desirable and necessary to achieve the postmining land use or that they were needed to achieve a quick-growing, temporary, stabilizing cover and measures to establish permanent vegetation were in an approved reclamation plan. It required that introduced species be compatible with animal and plant species of the area and meet the requirements of applicable State and Federal seed laws and not be poisonous or noxious.

Several commenters were against the adoption of proposed Section 816.111(b) and the related deletion of previous Section 816.112. One commenter believed the restructuring of the wording to give introduced species the same emphasis as species native to the area may result in less effective regeneration. The commenter further explained that the proposed rule change would result in less cover diversity than under the previous rule and a significant shift from forest to open-land uses. He surmised that there would probably be more grasses sown and fewer trees and shrubs planted. This, the commenter argued, would result in less effective reclamation because a combination of woody plants and ground cover was thought necessary to assure long-term erosion control and the stability of steep slopes common to Appalachia. The commenter also believed that herbaceous cover by itself would deteriorate without supplemental fertilization and reseeding.

OSM appreciates the commenter's concerns. However, the commenter has erred in assuming that regulatory authorities will approve the use of introduced species in a manner that would lead to the conditions which he described. Section 816.111(a)(1) requires the establishment of a diverse and permanent cover. Diversity could be achieved by planting a mixture of grasses and legumes. Under final Section 816.111(a)(2), introduced species may be approved only where desirable and necessary to achieve the approved postmining land use. The species comprising the vegetative cover, whether native or introduced, will have to be capable of self-regeneration and plant succession. Thus, if the performance standards are met, the objective of Section 515(b)(19) of the Act will be achieved.

Another commenter felt that it was a serious mistake to mix revegetation standards for native species with those for introduced species and recommended retaining Section 816.112 in its entirety. The commenter reasoned that the use of introduced species requires more intensive long-term management than native species and as a consequence special care must be used in determining whether to allow the use of introduced species in mined-land reclamation. OSM agrees with the commenter that introduced species must be carefully evaluated before being used in reclamation. Section

816.111(a)(2) specifically requires approval by the regulatory authority of all introduced species that are used in reclamation. Such usage must be consistent with the attainment of the requirements in Sections 816.111(b)-816.111(d).

One commenter said that the proposed rules, while maintaining restrictions on the use of introduced species as required by the Act, eliminated the native-species preference implied by the Act by placing both native and introduced species on the same footing. The commenter added that introduced species were selected in the past for use in reclamation if they were desirable in achieving the postmining land use, and that necessity, though often considered, was not a prerequisite for native species. The revised rules retain the "implied preference" for native species by requiring specific regulatory authority approval of introduced species in Section 816.111(a)(2) to be based upon such species being desirable and necessary to achieve the approved postmining land use.

A commenter contended that deletion of previous Section 816.112 in its entirety could substantially alter the results which reclamation achieves for wildlife. It was argued that, through evolutionary processes, assurance is provided that native plant species are compatible with resident wildlife populations. The compatibility of introduced species was thought to be impossible to document. This commenter strongly recommended retention of Section 816.112 (b), (c), and (d) of the previous rules which set conditions under which State regulatory authorities could approve the use of introduced species.

Regulatory authorities should be aware of the plant species that have been documented as being suitable for wildlife habitat and will have access to technical groups capable of supplying such information. The regulatory authority may, if necessary, consult State and Federal fish and wildlife services, State universities, and the U.S. Department of Agriculture, Soil Conservation Service Plant Materials Centers to determine whether a species is compatible with resident wildlife. Furthermore, the basic requirements of previous Section 816.112 (b), (c), and (d) are found in Section 816.111 (b)(4) and (b)(5) and (c).

Another commenter felt that the elimination of previous Section 816.112 could lead to the planting of nuisance exotics which tend to squeeze out native species. Multiflora rose was cited as an example of an introduced species that is detrimental. As noted earlier Section 816.111(a)(2) specifically requires regulatory approval of the use of all introduced species included in a mining and reclamation plan. Additionally, Section 816.111 (b)(4) and (b)(5) require that the reestablished plant species be compatible with the plant and animal species of the area and that State and Federal statutes governing the use of poisonous and noxious plants be met. These requirements provide an adequate safeguard against the planting of nuisance exotics.

In a similar vein, several commenters opposed deletion of the field-trial requirements of previous Section 816.112(a). Without giving any justification, one commenter said States should have no discretion to dispense with the requirement of field tests for introduced species. Another commenter contended that the deletion of previous Section 816.112(a) subverts the intent of Section 515(b)(19) of the Act and that the proposed rule was an open invitation for abuse of native-species requirements by coal operators and State regulatory authorities. The commenter stated that actual field trials over a long period of time are necessary before introduced species can be adopted for general use in establishing permanent cover. The commenter asserted that introduced species have several drawbacks: A generally low level of plant diversity in areas where they are planted, potential for early stand stagnation, and possible poor long-term adaptation to fluctuations in climate, such as sustained periods of drought.

Conversely, other commenters argued that State regulatory authorities are certainly able to approve the use of introduced species without field trials when revegetation success has already been successfully demonstrated and the species are desirable and necessary to achieve the postmining land use. One commenter noted that unnecessary compliance burdens would be avoided under the new language.

A commenter pointed out that many introduced species have become naturalized and that regulatory authorities are in a position to approve the use of desirable and proven species without the necessity of field trials, but thought that field trials should still be required on unproven species. Another commenter recommended that introduced species be field tested under the experimental practice provisions in 30 CFR 785.13.

Field trails are generally appropriate before unproven species can be used for surface mine reclamation. Other species that have been previously demonstrated, under similar biotic conditions, to be successful in achieving the specified postmining use generally do not require additional tests. Publications by Vogel (1981) and Thornburg (1982) are

examples of documents that can be used by regulatory authorities to identify native and introduced species that have been successfully used to revegetate mined lands. In addition, unproven species could be tested for suitability under the experimental practice rules if the requirements of Section 785.13 are satisfied.

A commenter suggested deletion of the reference to native species in proposed Section 816.111(b). The commenter believed OSM was trying to impose the same restrictions on native and introduced plant species and that it was not necessary to justify the use of native species.

As previously stated, paragraph (b) is equally applicable to native and introduced species. Some native species, as well as introduced species, may be unsuitable for reclamation because they take excessively long periods of time to establish and are not compatible with certain postmining land uses. In final Section 816.111(b), the proposed phrase "whether introduced or native" has not been adopted since the provision applies to all reestablished plant species unless specifically limited.

WATER AREAS AND ROAD SURFACES: The proposed rules did not include an exemption of revegetation requirements for water areas and road surfaces approved as part of the postmining land use. This exemption was found in previous Section 816.111(b)(1) and has been retained in the final rule as part of the introductory language in revised Section 816.111(a).

One commenter said that the proposal to delete the water area and road-surface exemption indicated OSM's appreciation of unneeded and overly restrictive requirements. Another commenter opposed the deletion because he believed that compacted dirt and gravel haul roads would not be adequately reclaimed and the areas affected would become permanently useless for any productive purpose.

The commenter may have misunderstood the exemption and its proposed deletion. The exemption applies only to water areas and road surfaces that are approved as part of the postmining land use. Temporary roads and water areas that are reclaimed must be regraded, covered with topsoil or topsoil substitutes, and planted to an approved vegetative cover which meets the requirements of Sections 816.111-816.116. As the preamble to the proposed rules pointed out, this change would merely have deleted language perceived to be unnecessary *(47 FR 12597)*. In light of the commenters' confusion concerning the proposed deletion, OSM has decided to retain the specific language to clarify that the exemption continues. The final rule language will not change operator responsibility with respect to areas covered by water and road surfaces.

DESIRABLE AND NECESSARY: Proposed Section 816.111(b)(1) required the reestablished plant species to be desirable and necessary to achieve the approved postmining land use. Final Section 816.111(b)(1) requires that all species used to reestablish vegetation be compatible with the postmining land use.

One commenter suggested changing the wording of the proposed requirement to "desirable or necessary" instead of "desirable and necessary." The commenter explained that there is a strong possibility introduced species may be highly desirable but not absolutely necessary for the approved postmining land use.

Section 515(b)(19) of the Act requires introduced species to be both desirable and necessary to achieve the approved postmining land use plan. OSM has retained this statutory language. Proposed Section 816.111(b)(1) would have extended application of the "desirable and necessary" standard to native species. The requirement that all species used be desirable and necessary for the postmining land use has not been adopted, since some land uses may not depend upon the vegetative cover. The requirement that introduced species be "desirable and necessary" for the approved postmining land use has been retained and included in final Section 816.0111(a)(2). OSM interprets "desirable and necessary" in this context to mean that revegetation is a necessary component of the postmining land use and that the use of the proposed introduced species is desirable and necessary in achieving that end use. The introduced species need not, however, be the only species capable of achieving the postmining land use.

SEASONAL CHARACTERISTICS OF GROWTH: Proposed Section 816.111(b)(2) required the reestablished plant species to have the same seasonal characteristics of growth as the original vegetation. One commenter said that the proposed rule conflicted with proposed Section 816.111(b)(1), which required the reestablished plant species to be desirable and necessary to achieve the approved postmining land use. It was argued that when the postmining land use is cropland or forage, the species chosen to achieve those uses should not be limited to those with the same characteristics

as the original vegetation, which could have been, for instance, sagebrush and blue grama grass. The commenter recommended that the term "seasonal utility" be substituted for "seasonal characteristics of growth."

Final Section 816.111(d) provides the desired exception sought by the commenter when the postmining land use is cropland. Where range and grazing land are the postmining land use, situations will exist where the range condition can be improved by changing the proportion of cool- and warm-season grasses as well as the proportion of forbs and shrubs. Thus, seasonal characteristics overall could be essentially the same as those in the premining plant community, but the proportion of total cover represented by each species may change. For these reasons, OSM has adopted the rule as it was proposed.

One commenter contended that previous Section 816.111 (b)(3) and (b)(4) should be retained. Previous Section 816.111(b)(3) defined seasonal variety and previous Section 816.111(b)(4) exempted cropland from the requirement to establish a permanent cover when operators planted crops normally grown. Previous Section 816.111(b)(4) was thought to be needed to prove productivity and a return to premining capability.

Seasonal characteristics of growth are more appropriate to describe species requirements than seasonal variety, for the reasons given in the preamble to the proposed rules *(47 FR 12597).* Furthermore, final Section 816.111(d) exempts cropland from permanent-cover requirements, and final Section 816.111 (a)(1) and (b)(1) require an effective cover that is compatible with the approved postmining land use. These rules result in essentially the same outcome as the previous rules which the commenter sought to retain. As for the need to return to premining capability, the success standard for cropland is treated under Section 816.116(b).

SELF-REGENERATION AND PLANT SUCCESSION: Final Section 816.111(b)(3) requires reestablished plant species to be capable of self-regeneration and plant succession. One commenter contended that under intensive forest management the "self-regeneration" requirement of proposed Section 816.111(b)(3) becomes a moot issue when select varieties of proven plant species are reestablished with each regeneration sequence.

OSM recognizes that in commercial forestry the clear-cutting and planting method of stand regeneration is a common silvicultural practice. Such land use becomes similar to cropland with the exception that the production cycle is much longer. The determination of the extent to which self-regeneration must be considered will rest upon such factors as whether there is a forest-management plan for the permit area that provides for replanting, and the surface owner's commitment to long-term wood fiber production.

Another commenter felt the reference to self-regeneration and plant succession was a good addition to the rules, but not entirely applicable to introduced species because many such species are not capable of self-regeneration and must be cultivated to maintain their productivity. This commenter advised retaining previous Section 816.111(b) and adding a requirement that the reestablished species be capable of self-regeneration and plant succession.

The legislative history of the Act supports OSM's conclusion that both species native to the area and introduced species used in revegetation should be capable of self-regeneration. (H. Rept. No. 95-218, 95th Cong., 1st Sess., 1977.) Hence, OSM has retained the requirement that the reestablished vegetation must be capable of self-regeneration and plant succession. This can be accomplished through the use of perennials capable of self-regeneration from roots, crowns, or seeds.

COMPATIBILITY: Final Section 816.111(b)(4) requires the reestablished plant species to be compatible with the plant and animal species of the area. One commenter suggested deletion of proposed Section 816.111(b)(4) in its entirety because it was believed to be in conflict with Section 816.111(a)(2), which permits the use of introduced species upon approval of the regulatory authority.

Any species approved for use in reclamation must be compatible with the plant and animal species of the area. Hence, Section 816.111(b)(4) is one of the criteria that the regulatory authority will use in determining whether to approve or disapprove any plant species proposed for planting in disturbed areas.

POISONOUS AND NOXIOUS PLANTS: Proposed Section 816.111(b)(5) required reestablished plant species to meet applicable State and Federal statutes regulating seed and introduced species. The proposed rule was essentially the same as previous Section 816.112(d); however, the phrase "and are not poisonous or noxious" was proposed to be

deleted. OSM asserted that compliance with applicable State and Federal statutes and the provision in Section 816.111(b)(1) which required all species to be "desirable and necessary" would effectively prohibit the use of species that were poisonous and noxious.

Several commenters opposed the proposed deletion. One commenter said that there is a substantial difference between an absolute prohibition as required by previous Section 816.112(d) and a "limitation of the use" as implied in the March 23, 1982, preamble *(47 FR 12598)*. The commenter added that the political realities are such that discretion afforded to State regulatory authorities to allow operators to use noxious weeds would result in their use more often than is desirable. Another commenter asked what purpose is served by the deletions and whether it was really counterproductive, burdensome, and duplicative to prohibit poisonous and noxious plants from use in reclamation. Without explanation, other commenters also opposed the change.

As indicated by the comments, there was much confusion resulting from the proposed deletion. In order to clarify the intent of the rule, OSM has added language that will require reestablished plant species to meet the requirements of State and Federal statutes regulating poisonous and noxious plants. The final rule deviates from the previous rule in that the prohibited plant species must be restricted by State or Federal laws or regulations. Many species, such as oak, hemlock, chokecherry, and millet, can be poisonous to livestock and humans under certain conditions. Normally these species are not a problem, and they possess traits that are desirable for achieving specific land uses. Therefore, OSM has limited the restriction on the use of poisonous and noxious plants to those plants that have been identified as poisonous or noxious under State or Federal laws or regulations.

One commenter maintained that the permittee should not be responsible for the natural invasion of undesirable, nonnoxious plant species on mined areas. A change in the language of Section 816.111(b) was proposed to limit operator liability.

The permittee is responsible for the establishment of vegetation that supports the postmining land use. In the event a "natural invasion" of undesirable plant species does occur, the operator is expected to use normal husbandry practices to eliminate the undesirable species while retaining or reestablishing, when necessary, the species that will achieve the approved postmining vegetative community.

SECTION 816.111(c)

Proposed Section 816.111(c) provided an exception to Section 816.111 (b)(2) and (b)(3) when the species were necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan. The final rule is adopted as proposed. One commenter approved the proposed language because it would allow the use of temporary cover species. This was considered to be both practical and beneficial to the environment since soil erosion would be prevented by the early stabilization of disturbed areas.

SECTION 816.111(d)

Proposed Section 816.111(d) provided an exemption to cover and species requirements found in Paragraphs (a)(1), (a)(3), (b)(2), and (b)(3) of the general requirements where the postmining land use was cropland. It also identified 30 CFR Part 823 as applying to areas designated as prime farmlands. The rule is adopted as proposed.

One commenter supported proposed Section 816.111(d) because it provided an exception to certain requirements that would be inappropriate and impractical for cropland. Another commenter was in basic agreement with the rule, but thought that a proviso should be added that would require a conservation plan for indicating how the operator planned to limit erosion to tolerable limits.

Part of the information the commenter is seeking in the conservation plan would already be required as part of the reclamation plan. Furthermore, operators will be required by Section 816.111(a)(4) to stabilize the soil surface from erosion. Cropland is not exempt from erosion-control standards. Erosion on cropland should be held to levels that would normally occur on similar unmined croplands.

One commenter suggested deleting the last sentence in the proposed rule which states that Part 823 applies to areas designated as prime farmland. OSM has included this informational note in the final rule to avoid any possible misunderstanding with respect to the requirements applicable to prime farmlands.

SECTION 816.113 - REVEGETATION: TIMING

Final Section 816.113 requires the planting of disturbed areas to be conducted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for planting is defined as the planting time generally accepted locally for the type of plant materials selected. This is similar to the proposal.

Proposed Section 816.113 contained a provision that allowed the seeding and planting of temporary cover or the use of other measures to control erosion until a permanent vegetative cover was adequately established. In the final rule, the provision concerning the use of temporary cover has not been adopted because it is redundant of Section 816.111(c), which allows the use of a quick-growing, temporary, stabilizing cover, and Section 816.114, which requires the use of soil-stabilizing practices.

One commenter contended that the term "disturbed area" had too broad a meaning and its use in the rule could be interpreted as requiring operators to establish permanent vegetation on areas that have not been prepared for permanent vegetation. The words "subject to Section 816.24 and Section 816.25" were suggested as an addition to the rule in order to prevent any misinterpretation. By requiring planting to occur after replacement of the plant-growth medium, it is clear under the final rule that the operator is required to establish permanent vegetation only on disturbed areas where topsoil or topsoil substitutes have been redistributed. Hence, no changes have been made as a result of this comment.

A commenter stated that the proposed words "seeded and planted" were redundant. OSM agrees and has used only the word "planted" in the final rule. Several commenters approved OSM's substitution of the proposed phrase "after replacement of the plant growth medium" for the phrase "after final preparation" which was contained in the previous rule. Other changes in the structure of the first sentence of the rule were adopted for clarity and will not affect the timing of revegetation.

A State regulatory authority argued that the last sentence of proposed Section 816.113, allowing temporary cover, was permissive rather than mandatory and thus was of no value. The commenter believed that topsoil must be protected from time of placement until permanent vegetation is established. Other rules, such as the proposed topsoil rules, were thought to be inadequate in providing for the needed protection, New language was suggested that would make the provision mandatory. This same commenter also recommended that the rule require temporary plant cover to be seeded as contemporaneously as practical with backfilling and grading. Other commenters sought to have the word "may" in the rule changed to "shall", thus making the planting of temporary cover mandatory.

Different opinions were expressed by two other commenters. One said that the control of erosion is adequately provided for in previous Section 816.24(b)(3) and Section 816.23(b), which pertain to topsoil storage and redistribution. The other felt the term "effectively control erosion" was too vague, ambiguous, and open to differing interpretations which could result in an impossible burden for operators. New language was suggested which would retain the permissive character of the rule but remove the reference to erosion control.

After considering these comments, OSM has decided not to adopt the last sentence of proposed Section 816.113, which would have allowed for the use of temporary vegetative cover and other measures to control erosion until a permanent cover was adequately established. This action is taken because the required protection is effectively provided in the following rules. In addition to the relevant portions of Sections 816.111 and 816.114, Section 816.22(d)(1)(iii) requires that topsoil and all other segregated materials be redistributed in a manner that protects the material from wind and water erosion before and after it is seeded and planted; Section 816.95 requires stabilization of surface areas; and final Section 816.100 requires that reclamation efforts, including revegetation, occur as contemporaneously as practical with mining operations. Also, under Section 816.100, the regulatory authority may establish schedules that define contemporaneous reclamation. These are broad, all-encompassing requirements that should effectively achieve the purpose of the language in the proposed rule. OSM anticipates that most operators will find that the planting of quick-growing annuals will be the easiest and most economical means for achieving compliance.

SECTION 816.114 - REVEGETATION: MULCHING AND OTHER SOIL STABILIZING PRACTICES

Proposed Section 816.114 would have allowed the regulatory authority to require the application of suitable mulch or use of other soil stabilizing practices where deemed necessary. In the previous rule, the use of mulch and other soil stabilizing practices was mandatory on all regraded and topsoiled areas except where the permittee could demonstrate that alternative reclamation procedures would achieve successful revegetation and not cause or contribute to air or water pollution. Suspension of the requirement was possible only on a case-by-case basis.

The final rule, which is derived from previous Section 816.114(a), requires the use of suitable mulch and other soil stabilizing practices on all areas that have been regraded and topsoiled or covered by topsoil substitutes. Compliance may be achieved through the application of crop residues, hay, nontoxic industrial wastes, processed wood fibers, and chemical soil binders or through the planting of annual grains, grasses, or other covers which serve as living mulches. The regulatory authority may waive this requirement when seasonal, soil, or slope factors result in a condition where such practices, as determined by the regulatory authority, are not necessary to control erosion and to promptly establish an effective vegetative cover.

In adopting this final rule, OSM intends to impose the requirement to use mulch and other soil stabilization practices when and where they are needed. Congress recognized, when it passed the Act, that "the use of mulch, fertilizer, and soil stabilizers will probably be common, if not universal, in revegetation activities." (H. Rept. No. 95-218, 95th Cong., 1st Sess., 108 (1977)). In a similar fashion, the final rule also recognizes that mulching and other soil stabilization practices should be a standard practice in surface mine reclamation. However, such practices may not be needed during brief periods in the spring when seed germination and plant-growth conditions are optimum, where regrading results in gradual slopes, and where soils, because of their physical properties, are not easily eroded. In recognition of these and other situations where the use of mulch and soil stabilization practices may not be necessary, OSM has provided an opportunity for regulatory authorities to waive the requirement for their use.

The previous rule allowed for a suspension of the requirement by the regulatory authority on a case-by-case basis after the operator demonstrated that alternative procedures would achieve the requirements of Section 816.116 and would not cause or contribute to air and water pollution. In the final rule, waiver of the requirement may be handled on an individual basis or may be incorporated as part of the regulatory program and apply to all or parts of operations that meet the conditions of the waiver. Any waiver must be based upon the regulatory authority's past experience and any technical documentation that is available. In certain instances, a programmatic waiver could provide the necessary environmental protection while relieving operators of burdens entailed in case-by-case demonstrations.

Two States urged OSM to retain the previous rule. One contended that loss of topsoil by erosion was one of the more serious long-term effects of surface mining. The previous rule was thought to result in more protection of this valuable resource than the proposed rule. One of these States also argued that the burden of demonstrating that mulch is not needed should be placed with the permittee rather than requiring the regulatory authority to determine when mulch is necessary. This viewpoint was supported by similar comments from a third State and one additional commenter. In contrast, another State supported the proposed rule as being especially reasonable and desirable.

One commenter suggested that Sections 515(b)(2), 515(b)(4), and 515(b)(16) were sufficient statutory justification to retain the previous rule. This commenter felt that mulch, in one form or another, was almost always beneficial in controlling erosion and promoting a rapid and effective vegetative cover even on level terrain, as evidenced by the reclamation literature and field observations. A similar position was taken by another commenter who believed that failure to use mulch in any region would significantly increase the likelihood of erosion before establishment of vegetation and that such erosion would reduce the productive potential of the soil. The preamble to the previous rule and literature in the administrative record were cited as ample reason for a mulching requirement. A commenter who supported the proposed rule noted that mulching played a different role in the Midwest than it did in Appalachia. A soil conservation organization from the same State argued that the proposed rule would contribute to increased erosion.

OSM finds that mulching is an accepted reclamation practice in most, but not all, cases. Two recent handbooks summarize current thinking on the use of mulch in surface mine reclamation. In his guide for revegetation of coal minesoils in the Eastern United States, Vogel (1981) states:

Mulches aid revegetation by reducing surface or sheet erosion, conserving soil moisture, and protecting seeds and seedlings during the initial establishment of vegetative cover, and modify extremes in the soil's surface temperature. Mulches aid vegetation establishment, especially under conditions of environmental stress and on minesoils that have physical and chemical characteristics that hinder establishment and growth of plants.

Thornburg (1982) reports the following conclusion in his handbook on the use of plant materials on surface-mined lands in arid and semiarid regions:

Mulches are often necessary and are generally beneficial in the arid and semiarid areas, especially on south and west facing slopes or alkaline areas.

One commenter opposed the optional nature of the proposed rule because he believed the coal industry would almost always be able to push a State into the least stringent regulatory posture. Minimal standards were believed necessary to prevent this from happening. Similarly, another commenter felt that the proposed rule would probably result in State regulatory programs that do not require mulching or soil stabilization in any form. It also was argued that the proposed rule allowed too much discretion on the part of the regulatory authority and that the word "may" in the proposed rule should be changed to "shall." Another commenter, who objected to the proposed rule, felt that it was contradictory because the regulatory authority might not require mulch where deemed necessary. This commenter believed that, if mulch was deemed necessary by the regulatory authority, then it should be required, not optional. Sensitive environmental conditions were cited by still another commenter as reason for having mandatory mulching requirements.

There was disagreement on the economic implications of the proposed rule. One commenter said that the elimination of the mandatory mulching requirement would be of economic and practical benefit to operators in those areas which would not require mulching for stabilization or growth enhancement, while another commenter argued that the adverse impacts of not using mulch could far outweigh any cost savings.

The reasons OSM is adopting the final rule are described in the preceding paragraphs. OSM recognizes that in these situations where the regulatory authority concludes that mulching is not necessary, operators may obtain an accompanying economic benefit. However, any waiver of the requirements of Section 816.114 must be based on the finding set forth in that section.

Finally two commenters suggested language changes in the proposed rule. One recommended adding the phrase "for erosion control and plant establishment" to the end of the rule in order to identify the objectives of using mulch and soil stabilization practices. The other commenter noted that the provisions of the section applied to both mulch and other soil stabilization practices and, to be consistent, that the title of the section should refer to both. OSM agrees with the latter comment and has changed the section title in response to the commenter's suggestion.

SECTION 816.115 - REVEGETATION: GRAZING

Previous Section 816.115 required livestock grazing for the last two years of the responsibility period when the approved postmining land use is range or pasture land. This requirement was intended to assure that the vegetation would support about the same number of livestock that would be supported had the area not been mined. OSM suspended previous Section 816.115 on August 4, 1980 *(45 FR 51549)*, in response to a U.S. District Court ruling that section 515(b)(19) of the Act does not require lands with a postmining use of pasture or grazing to be actually subjected to grazing activities. In re: Permanent Surface Mining Regulation Litigation, No. 79-1144 (D.D.C., February 26, 1980.) The final rule, which removes the special success standard of previous Section 816.115, does not require or restrict livestock grazing on mined lands. The success standard for grazing lands in these revised rules is contained in final Section 816.116(b)(1).

Five commenters discussed the proposed removal of Section 816.115. One commenter believed the proposed action by OSM was reasonable and desirable, while the other four sought to retain the grazing requirements of the previous rule.

One commenter alleged that OSM had side-stepped the issue of requiring grazing of reclaimed land, and that Judge Flannery had erred in his conclusion that restoration of premining productivity could be determined by making a soil survey. The commenter felt that Section 816.115 should be reinstated because new technical support for the grazing

requirement, which was not available to the court, had been developed. The commenter cited a National Academy of Science report (National Research Council, 1981) as evidence that a soil survey is not adequate to measure the productive potential of reclaimed soils and that productivity on lands reclaimed for grazing must be based on the results of actual grazing.

OSM recognizes that the National Academy of Science study did conclude that a soil survey alone is insufficient to measure the productive potential of reclaimed soils and that grazing is one means of showing that productivity had been restored. However, in light of the court's decision, there is still an insufficient basis for OSM to promulgate a rule requiring grazing on all reclaimed pasture and grazing lands. Use of a reference area or other appropriate standard is also possible. OSM's adoption of this position is not meant to preclude States from either allowing or requiring grazing of reclaimed pasture and range land.

Other commenters also thought that the grazing requirements of previous Section 816.115 should be retained, especially for determining the success of revegetation on western range lands. One organization asserted that the only way to determine whether or not the carrying capacity of reclaimed mine soil was equal to that which existed prior to mining would be to graze livestock on it using the same management techniques that were used prior to mining.

The determination of range land productivity should consider the pounds of beef (or equivalent) that may be produced per unit of area. This is dependent upon the quality as well as the quantity of forage available. Hence, equal quantities of forage are not always a true reflection of range or grazing land productivity, and measures of revegetation success should take into account the nutritional value of the forage when determining whether productivity has been restored. However, OSM is not requiring that actual grazing must occur in each instance.

SECTION 816.116 - REVEGETATION: STANDARDS OF SUCCESS

Final Section 816.116 is divided into three paragraphs. Paragraph (a) describes, in a general manner, how the success of revegetation shall be determined; Paragraph (b) identifies minimum conditions that must be satisfied for specific land uses; and Paragraph (c) sets provisions relating to the period of operator responsibility for revegetation success.

The final rules differ in several important respects from those which were proposed. Language has been added in Section 816.116(a)(2) to set a benchmark which all revegetation success standards used by regulatory authorities must equal or exceed. This should not encumber a regulatory authority's ability to develop standards that reflect the capability of local soils and climatic conditions. Furthermore, the 90 percent equivalency provision contained in the previous rule, but not included in the proposal, has been retained. Also, the use of cultural practices during the period of responsibility is more restricted than was proposed. The following portion of the preamble discusses these and other changes and the comments that were received.

A few commenters offered remarks about their general impression of the proposed rule changes for Section 816.116. One said that the overall effect of the proposed rule changes was a weakening of the previous rules that would result in a failure to restore the land affected to a condition capable of supporting the uses which it was capable of supporting prior to any mining. Another commenter believed that, under the proposed rules, regulatory authorities could arbitrarily set success standards which might be less stringent than those required by the Act and recommended that more specific guidelines be established by OSM.

OSM has, in selected sections, added more specific requirements. However, specific and detailed rules or criteria would remove flexibility that is needed by the regulatory authorities to develop rules which reflect differences in climate, soil, topography, and other conditions. This effort by OSM to provide greater flexibility in achieving revegetation success standards should not be construed as a weakening of those standards or a lesser commitment to the environmental protection provisions of the Act. OSM's rules provide a framework for individual regulatory programs. These standards are expected to be supplemented, where necessary, by regulatory authorities.

SECTION 816.116(a)

Proposed Section 816.116(a) identified general criteria on which the success of revegetation should be judged. These included the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the

cover occurring in natural vegetation of the area, and the general requirements of Section 816.111. The final rule is the same as the proposed rule, with some minor changes in wording for clarity.

One commenter recommended that in addition to extent of cover, species diversity should be specified as one of the general criteria for judging the success of revegetation. The commenter said that this was needed to minimize the potential for the establishment of monocultures or "species-poor" habitats detrimental to the premining natural diversity of wildlife populations. Another commenter asked the significance of the language "and other general requirements of Section 816.111" and whether it meant that a diversity success standard would be applied.

The purpose of Section 816.116(a) is to set a general basis for determining revegetation success. This statement includes the effectiveness of the vegetation for the approved postmining land use, extent of cover, and other requirements of Section 816.111. Diversity of vegetative cover is therefore a success standard since it is required by Section 816.111(a)(1).

One commenter thought that productivity and diversity should be given equal weight to cover as a parameter for determining the success of revegetation. This was believed to be necessary in order to fully implement Section 515(b)(19) of the Act. OSM disagrees that a general premise can be established assigning weights to the factors to be considered in judging vegetation success. Section 515(b)(19) prescribes ground cover as a parameter for determining success of revegetation. The vegetative cover must be diverse, effective and permanent. As previously indicated, productivity may be included as a measure of the effectiveness of the permanent cover.

Another commenter noted that the word "judged" had been substituted in the proposed rule for the word "measured" in previous Section 816.116(a). The commenter thought that this substitution implied that OSM would use qualitative rather than quantitative analysis for determining successful revegetation. The commenter added that techniques and standards for quantitative measurement should be maintained.

OSM has retained the proposed wording because the proposed rule and the previous rule used these words in a different context. Final Section 816.116(a) describes the substantive areas that will be used to evaluate success; final Section 816.116(a)(1) discusses measurement. Previous Section 816.116(a) was concerned with techniques for measuring success. Also, some requirements such as same seasonal characteristics of growth and capability of self-revegetation may not require a numerical evaluation.

One commenter suggested deleting the phrase "the extent of cover compared to the cover occurring in natural vegetation" from proposed Section 816.116(a) in order to clarify and improve the rule. As justification for the deletion, the commenter explained that this concept was repeated in proposed Section 816.116(b) and that its presence in Section 816.116(a) might limit regulatory authorities to using only reference areas for determining revegetation success.

The commenter may have confused the general requirement of achieving cover equal to the cover of the natural vegetation of the area in proposed Section 816.116(a) with approaches or methods of demonstrating that cover requirements have been satisfied. Reference areas are one of several possible means of demonstrating that an operator is in compliance with Section 816.116(a). Retention of the question wording does not limit the regulatory authority to using reference areas.

SECTION 816.116(a)(1)

Proposed Section 816.116(a)(1) would have required success standards and sampling techniques for measuring success to be selected by the regulatory authority after consultation with appropriate State and Federal agencies. These standards were to be specified in an approved regulatory program. The final rule adopts the proposal with one change. It does not require consultation with other agencies.

Two commenters recommended deleting proposed Section 816.116 (a)(1) and (a)(2) and substituting new language for Section 816.116(a). The new language suggested by the commenters would require success to be measured by techniques approved by the regulatory authority utilizing recognized and practical evaluation techniques appropriate for the various subregions of the United States and accepted by recognized scientific and professional groups. As justification for the recommended changes, the commenters argued that there is no statutory language which supports reference areas or technical guidance procedures as the only methods to compare premining and postmining vegetation.

OSM was said to have failed to demonstrate and substantiate the statistical validity of the reference area method that it required for testing revegetation success. Furthermore, the commenters argued that proposed Section 816.116 (a)(1) and (a)(2) should be deleted because they were not applicable throughout the country.

OSM has not adopted the suggested changes. Neither the Act nor the proposed rules mandate the use of reference areas for evaluating revegetation success in every situation. However, reference areas may be required when deemed appropriate by the regulatory authority. The rules also allow other standards for success, such as fixed standards (number of trees and shrubs per acre) and variable standards (average county yield by soil type), to be developed and applied by regulatory authorities when these standards are appropriate and approved as part of the regulatory program.

The final rules allowing the use of reference areas have ample technical support. The National Academy of Sciences (National Research Council, 1981) suggests two basic approaches that may be used for measuring revegetation success. The first is to specify levels of biomass production -- amount of ground cover and kind of plant species to be established -- based on the capacity of soils to support vegetation or to grow crops. The second approach to evaluating reclaimed land is to set aside an undisturbed reference area near the reclaimed site, with a pattern of soils similar to that of the premining soils. The productivity, cover, diversity, or other applicable measurement of the reclaimed area can be compared with the reference area when determining the success of revegetation.

One commenter asked three questions concerning the provisions of proposed Section 816.116(a)(1).

1. What is meant by the term "standards for success"?

2. Will sampling techniques acceptable to the regulatory authority be spelled out in regulations, rather than guideline form?

3. Are current approved regulatory programs to be revised accordingly?

Standards for success are approved models or measures by which the properties of vegetation on reclaimed areas are compared for the purpose of determining the degree of success. The applicable properties to be tested will depend upon the postmining land use and the method of evaluation. Inherent in this concept is a statement of the minimum level or value that is acceptable for ending the period of operator responsibility and release of performance bonds.

Sampling techniques acceptable to the regulatory authority must be included in all regulatory programs. They may appear as a rule or may be in a guideline form that is incorporated into the regulatory program. These sampling techniques are subject to review and public comment. The literature cited in this preamble may be used by States as technical references on vegetation sampling. Previously approved regulatory programs need not be revised if they include success standards or sampling techniques for measuring success which are consistent with these final rules.

One commenter suggested that the statistical expertise require to enforce the proposed rules will be greater than that of the typical inspector and many regulatory authority staffs. OSM does not agree. State regulatory authorities usually have a group of experienced inspectors to perform bond release inspections. Many of these States had elaborate sampling and statistical testing requirements prior to the Act. Other have increased their staff capabilities with the development of permanent regulatory programs for their States. Statistical expertise required under these final rules is not that different from that required under the previous rules. In any case, guidelines developed to supplement the requirements of the rules could simplify inspector responsibilities and minimize the burden on the regulatory staff.

One commenter sought to substitute the words "ecologically sound" or "scientifically acceptable" for the words "statistically valid" which describe the techniques for measuring revegetation success in final Section 816.116(a)(1). The commenter expressed concern that unless the language was changed it would be difficult to obtain statistically valid sampling in some sparsely vegetated communities on Western lands.

A second commenter also concerned with the application of statistics contended that sampling methods generally used to obtain vegetative cover data do not seem to have adequate repeatability to support their use. The commenter recommended that OSM reconsider the proposed rule in light of what is statistically achievable and the burden such rules place upon operators.

OSM has reviewed the requirements of the proposed rule and decided to retain them in the final rule. Under this rule, the method of sampling vegetation could vary depending upon the precise standard for success included in the State program. In this manner, both an "ecologically sound" and "scientifically acceptable" technique for measuring the success of revegetation can be developed. On sparsely vegetated lands, sampling may be limited to gathering data for estimates of total vegetative ground cover. There also may be circumstances where, with the approval of the regulatory authority, historical data collected for the same cover type within the region can be used, rather than reference-area data. In the East, 100 randomly located point-frequency observations will usually provide an acceptable sample size for the estimation of vegetative ground cover. Small sample sizes are associated with large statistical error which can make a test for revegetation success meaningless. OSM has not stated a level of sampling precision in the final rules but will instead evaluate on a case-by-case basis the adequacy of predetermined sample sizes or methods of sample size selection proposed for use in State programs.

Four commenters suggested changes to the proposed language which would have required the regulatory authority to consult with appropriate State and Federal agencies when selecting standards for success and sampling techniques for measuring success. Two commenters wanted language that would require consultation with Federal agencies only when Federal land is involved. A third commenter suggested substituting the words "organizations and individuals" for "State and Federal agencies" because the Act does not specifically require coordination with government agencies. Another commenter wanted to modify the proposed language by stating that Federal agencies include the U.S. Department of Agriculture (USDA). The USDA was cited as having recognized expertise in revegetation.

OSM has reviewed these comments and decided to delete the consultation requirement. State regulatory authorities are capable of determining which organization or individuals can provide them with the best technical assistance in developing success standards or whether such assistance is needed. This deletion will not preclude OSM from using the expertise of other agencies when evaluating success standards proposed by the States.

In support of proposed Section 816.116(a)(1), one commenter wrote that the setting of standards for measuring success is properly left up to the State regulatory authorities because of the diverse environmental conditions throughout the U.S. The commenter added that States should not have to refer to technical guidance procedures published by the USDA or U.S. Department of the Interior (USDI) as was required by the previous rule.

OSM agrees and has adopted this aspect of the proposed rule because the Act does not limit success standards to those published by USDA or USDI. Also, universities, professional societies, State agencies, and conservation organizations often have the necessary expertise to develop valid standards, and OSM does not want to limit or exclude the use of such outside assistance.

SECTION 816.116(a)(2)

Proposed Section 816.116(a)(2) required standards for success to include criteria to evaluate ground cover, production, or stocking. These parameters were considered to be equal to the approved success standard when they were "equivalent" with 90-percent statistical confidence. Instead of an absolute equivalence, the final rule contains the provision found in previous Section 816.116(b)(3), which allows 90 percent of a standard to be considered equal to the standard for the purpose of determining revegetation success.

Sample estimates are subject to variation. How much they vary depends primarily on the inherent variability of the population and on the size of the sample and population. The statistical way of indicating reliability of a true population parameter is to establish a confidence interval. A confidence interval can be defined as the range within which a sample estimate can vary and not be significantly different than the population parameter at a given level of statistical confidence. The final rule clarifies that the proposed phrase "90-percent statistical confidence" was intended to require a 90-percent statistical confidence interval to be used when measuring revegetation success. The desired level of statistical confidence associated with an interval is usually referred to as the "alpha" error. A 90-percent confidence interval has a 0.10 alpha error.

Two commenters proposed changing the 90-percent statistical confidence interval that was specified in the proposed rules. One suggested using a 95-percent confidence interval because that level of confidence is comparable to that used in most agricultural experiments. Another commenter desired to retain the 80-percent statistical confidence interval for shrublands which was specified in previous Section 816.116(b)(3). As justification, the commenter stated that unless

confidence intervals are tailored to different community types, it may discourage operators from establishing diverse plant communities since diversity increases the statistical variability of the measured parameters.

OSM has retained the 90-percent statistical confidence interval in the final rule. Adoption of a 95-percent confidence interval as suggested by the commenter would increase the probability of a "Type II" error. An error of this nature occurs when the permit area lacks sufficient vegetative growth to meet the designated standard but would be declared to have been successfully revegetated on the basis of evidence derived from sample data. The Wider 95-percent confidence interval would allow a greater acceptance of samples from the lower end of the predicted range of revegetation sample values than would the 90-percent confidence interval. In light of the environmental consequences of arriving at an incorrect conclusion (i.e., release of a performance bond when revegetation is inadequate), a 90-percent confidence interval is more appropriate for regulatory purposes than a 95-percent confidence interval.

An 80-percent confidence interval for shrublands would be a more stringent test of revegetation success than would be used for other vegetative cover types. This is because an 80-percent confidence interval (i.e., the range of acceptable sample values) is narrower than a 90-percent confidence interval. Thus, it would be statistically more difficult to establish revegetation success on shrublands because there is a smaller range of acceptable values. The 90-percent confidence interval is adequate to assume that operators who establish shrubland plant communities will attain revegetation success.

Four commenter noted that the proposed rule omitted the equivalency provision found in the previous rule. This provision stated that ground cover, productivity, and stocking will be considered equal to the success standard when they are equal to 90 percent of the standard. Two commenters said that the omission would "tighten" the rule. Another commenter argued that the provision should be retained for the reason given in the preamble to the previous rule *(44 FR 15237*, March 13, 1979). In that preamble, OSM stated that the use of 90 percent was justified to allow for climatic variations that may affect productivity during the two consecutive growing seasons that production is measured to determine revegetation success.

The same preamble also stated *(44 FR 15238)* that "the 90-percent requirement for ground cover and production is an equivalent measure of success since there has to be a basic assumption that productivity will continue to improve with time when the land has been restored to the original productive capacity." The last commenter also advocated keeping the 90-percent equivalency provision and explained that the extreme annual and spatial variability of vegetation cover and production, particularly in the western United States, justified its retention. OSM agrees with the commenters' reasoning and has included the 90-percent equivalency provision in the final rule.

A commenter believed that proposed Section 816.116(a)(2) did not comply with the statutory requirements of Section 102 of the Act. The commenter stated that the proposed language contained no clear threshold below which a standard could be considered unacceptable by OSM. The following language was suggested: "In no event shall the chosen standard be lower than ground cover, productivity, or tree stocking standards that would be normal for the premine soils in the area being reclaimed. Where available, the standards should be based on the county average yield, per soil type in the areas being reclaimed under equivalent levels of management." The commenter added that the proposed language should prevent disparity from developing between the use of revegetation standards and reference areas and should provide a necessary minimum criterion by which acceptability of a proposed standard can be judged.

OSM agrees that there should be a certain degree of uniformity among the vegetation success standards developed by the States. Such a standard is provided generally in Sections 816.111(a) and 816.116(a). These requirements are in accord with Section 515(b)(19) of the Act. As previously indicated, Paragraphs (a)(1) and (a)(2) provide standards for the measure of success and do not include a success threshold. However, in response to the comment, final Section 816.116(a)(2) clarifies that the criteria selected for the success standard must be representative of unmined lands in the area being reclaimed. This should prevent potential disparity between the use of reference areas and the use of other standards as the measure of success. The commenter's suggestion requiring use of county average yield as the standard when available is rejected because it would unnecessarily have limited the type of success standards that could be used by regulatory authorities.

One commenter believed that OSM had misread Section 515(b)(19) of the Act when drafting proposed Section 816.116 (a)(2) and (b). It was pointed out that this section requires that vegetative cover be "capable of self-regeneration and plant succession at least equal in cover to the natural vegetation of the area -- not that the former level of cover actually be present."

OSM disagrees. The use of the term "capable" in Section 515(b)(19) establishes the requirements for "self-regeneration" and "plant succession," not the requirement pertaining to ground cover. Thus, the extent of postmining cover must equal the cover of the natural vegetation of the area and not merely be capable of doing so. As stated earlier, under final Section 816.116(a)(2), "equal" means 90 percent of the premining cover with 90-percent statistical confidence.

One commenter suggested changing the language of proposed Section 816.116(a)(2) by including both shrubs and trees to describe the type of stocking to be evaluated. OSM has not adopted the proposed word "tree" in the final rule to avoid the implication that stocking applies only to trees.

One commenter suggested specifying "species diversity" as one of the vegetation parameters in Section 816.116(a)(2). This was proposed to minimize the potential for the establishment of monocultures or species-poor habitats detrimental to wildlife. OSM has not accepted the commenter's suggestion because Section 816.116(a)(2) applies to only those parameters that will require testing. The evaluation of species diversity, regenerative capacity, and seasonal characteristics of growth required under Section 816.116(a) by the reference to Section 816.111 may not involve sampling and statistical testing. The regulatory authority will select appropriate methods to evaluate these parameters.

One commenter suggested changing the second sentence in proposed Section 816.116(a)(2) to indicate that statistical tests are to be used to demonstrate that reclaimed areas are in less than the desired condition. As justification, the commenter noted that statistical tests are designed to prove that population parameters of data are unequal, never that they are equal. OSM has adopted the suggested change in wording of the rule because it more accurately identifies the manner in which statistical tests will be used. In statistical tests, the null hypothesis usually states that there is no difference between the true value of the population parameter and that which is being hypothesized. The null hypothesis is a proposition which is considered valid unless evidence throws doubt on it. This means it is assumed that the mine operator has achieved the required degree of revegetation success unless evidence as provided by the sample data indicates that the standard has not been attained.

One commenter suggested the following language as the first sentence in Section 816.116(a)(2): "Standards for success of revegetation are to include criteria to evaluate those vegetation parameters appropriate for the approved postmining land use." The commenter reasoned that, aside from the specific requirement for cover, the Act does not require anything more than the achievement of the approved postmining use.

This commenter failed to recognize that Section 515(b)(19) of the Act requires that the reestablished vegetation be diverse, self-regenerating, effective, and of the same seasonal variety.

SECTION 816.116(b)

Final Section 816.116(b) provides for the application of success standards in accordance with the approved postmining land use and sets minimum conditions for specific land uses. These conditions identify certain vegetation parameters that must be evaluated when determining the success of revegetation for grazing land or pasture land, cropland, fish and wildlife habitat, recreation areas, forest, industrial, commercial or residential land uses, and previously mined areas. The final rule differs from the proposed rule in that it does not require concurrence from the Federal land management agency on minimum stocking levels and planting arrangement when Federal lands are involved, since the responsibilities of the Federal land management agency are covered by 30 CFR 740.4 in the Federal lands program *(48 FR 6936,* February 16, 1983). Also, the provisions of previous Section 816.116(b)(3)(ii), regarding land to be used for industrial, commercial, or residential use, has been retained; ground cover for areas previously disturbed by mining must be adequate to stabilize the soil surface from erosion as was specified in previous Section 816.116(b)(3)(i), but there is no description of the soil to be used.

Commenters suggested deleting all of proposed Section 816.116(b). One reasoned that this section provided too much of a "cookbook" approach. Another commenter said that the revegetation standards were general in nature and would be difficult to address across all mining regions of the United States.

The provisions of Section 816.116(b) are general to allow regulatory authorities the flexibility to develop success standards that are tailored to conditions that exist within their States. OSM does not consider this a "cookbook"

approach. The rule does set criteria that must be examined to determine success, but it is the States' obligation to identify the particular procedures which will be followed.

One commenter suggested substituting the word "approved" for the word "selected" in Section 816.116 (b)(1) and (b)(2). The commenter reasoned that the mine operator clearly has responsibility for selecting reference areas where required and that success standards may be selected or required by State or other agencies to be consistent with local conditions and rules. In these instances, the word "approved" more appropriately describes the regulatory authority role.

OSM agrees and has changed "selected" to "approved" in the final rule. It is the responsibility of the mine operator to select reference areas to be approved by the regulatory authority when this method of measuring success is contained in the regulatory program as a means of determining the success of revegetation.

CROPLAND: Final Section 816.116(b)(2) requires that for areas developed for use as cropland, crop production on the mined land must be at least equal to that of a reference area or other success standard approved by the regulatory authority.

One commenter wanted to require that all crops which are part of a normal production cycle be grown to demonstrate success of revegetation on cropland. The commenter explained that each crop responds differently on reclaimed land and cited as evidence soybean and corn yields on a demonstration mine in Iowa.

Although OSM agrees with the commenter's contention that each crop will respond differently to postmining soil conditions, it is not necessary to require all crops in the rotation be grown to demonstrate revegetation success. The proposed rule was written in a broad manner to allow States the flexibility to determine which crop or group of crops needs to be grown to satisfy the productivity requirement. Furthermore, States should recognize that crops in a rotation may respond differently on reclaimed sites and therefore should develop their standards to accommodate such conditions.

FOREST, WILDLIFE HABITAT, AND RECREATION AREAS: For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, final Section 816.116(b)(3) requires vegetation success to be determined on the basis of tree and shrub stocking and vegetative ground cover. Final Section 816.116(b)(3)(i) requires minimum stocking and planting arrangements to be specified by the regulatory authority on the basis of local and regional conditions and after consultation with the State agencies responsible for the administration of forestry and wildlife programs. Final Section 816.116(b)(3)(ii) requires that trees and shrubs used in determining the success of stocking and the adequacy of plant arrangement must have utility for the approved postmining land use. Such trees and shrubs must be healthy at the time of bond release and must be in place for at least two growing seasons to be counted in determining stocking adequacy. An additional requirement that 80 percent of the trees and shrubs used in determining revegetation success must be in place for at least 3 or 8 growing seasons is described below.

One commenter objected to what was believed to be the lack of a minimum success standard for ground cover. The commenter thought it to be foolhardy to relax the standards for revegetation prior to any long-term demonstration of whether the previous performance standards were adequate.

Final Section 816.116(b)(3)(iii) requires the vegetative ground cover not to be less than required to achieve the postmining land use. This, in effect, is a minimum standard for ground cover where the postmining land use is forest, wildlife habitat, shelter belts, and recreation. The rule must be written in a general form because of the variation in natural ground cover conditions throughout the States. Thus, a specific percentage of ground cover is not required. Each State will find it necessary either to require the use of reference areas, to specify minimum levels of ground cover as a percentage of surface area, or to adopt some other acceptable standard.

One commenter suggested adding herbaceous production as an additional parameter for determining revegetation success for wildlife habitat, recreation, and shelter belts. No reason was given by the commenter for suggesting this change.

Herbaceous production is not a primary measure of revegetation success where the postmining land use is recreation or shelter belts. It is important where the postmining land use is wildlife habitat for grazing animals. In such situations, the regulatory authority may find it desirable to use the productivity of herbaceous cover as a determinant of revegetation success.

Two commenters sought to have OSM reinstate minimum tree and shrub stocking requirements. The first commenter argued that a Federal standard was needed to avoid environmental "bargaining" and varying interpretation that made the Act necessary. The second commenter proposed a new subparagraph (b)(3)(iv) that required a minimum stocking of 450 trees or shrubs per acre with no less than 75 percent being of commercial value. This proposal tracks the requirements of the previous rule. As justification for the proposal, the commenter cited the preamble to the previous rule *(44 FR 15241)*.

OSM disagrees with these commenters and believes that a minimum stocking level need not be established in the Federal rules. However, States may find it appropriate to set minimum stocking levels in their programs. Such minimum levels must be determined on the basis of local and regional conditions and in no event be lower than would be expected or is commonly found on similar unmined lands in the area. Furthermore, it is not necessary to make a distinction in the Federal rules between commercial and noncommercial forest land; however, some States may find such a classification advantageous when setting tree stocking success standards.

One commenter advocated requiring regulatory authorities not only to consult with State forestry and wildlife agencies but to receive the approval of these agencies when determining minimum stocking levels and planting arrangements. The commenter explained that these agencies were most competent to judge the adequacy of standards for shrub and tree stocking and planting arrangement.

Approval by such agencies is not needed. OSM acknowledges that these State agencies are authoritative sources of forestry and wildlife management information and that State regulatory agencies should strongly consider their recommendations when setting minimum tree and shrub stocking levels in State regulatory programs. However, the responsibility under the Act rests with the regulatory authority.

Two commenters felt that the reference to Federal lands should be deleted from proposed Section 816.116(b)(3)(i), which required State regulatory authorities to obtain concurrence from Federal land management agencies when setting minimum stocking levels and planting arrangements for Federal lands. The commenter suggested that references to Federal lands should be limited to the Federal lands program in 30 CFR Chapter VII, Subchapter D, and to Federal-State cooperative agreements.

OSM agrees with the commenters and has not adopted the requirement in the final rule. Final 30 CFR 740.13(c)(5) requires the regulatory authority to consult with the Federal land management agency and include any comments in the record of the permit decision *(48 FR 6937,* February 16, 1983). This requirement in the Federal lands rules is believed to be adequate to allow Federal land management agencies a voice in determining stocking levels and planting arrangement on Federal lands.

One commenter wanted to know how the utility of trees and shrubs for the postmining land use would be determined and who would do it. It was noted by the commenter that some species, such as European black alder and autumn olive, are nitrogen-fixing and therefore contribute to the growth of the permanent timber stand but may not have utility for the postmining land use.

The utility of trees and shrubs for the postmining land use will be determined by the regulatory authority. Section 816.116(b)(3)(ii) should be interpreted as a general requirement. For example, if the postmining land use is commercial forestry, then an adequate number of the trees that are planted must be species with commercial value. If the postmining land use is wildlife habitat, the species planted and counted for meeting the stocking requirement should be recognized for their value in providing food, cover, or other needs of wildlife. Similarly, regulatory authorities can develop standards that reflect more than one intended use, such as a combination of forestry and wildlife habitat.

Commenters objected to the proposed provision that would allow trees and shrubs to count toward the success standard if they had been in place a minimum of two growing seasons. One charged that the "two growing seasons" standard may seriously compromise the general revegetation requirement of achieving a permanent vegetative cover that is capable of self-regeneration. The commenter added that the planting of woody species as few as 2 years prior to bond release exceeds the reasonable limits of non-augmentative practices that can be expected to continue as part of the postmining land use. Also, the period of extended responsibility for husbandry practices used on trees and shrubs should be equivalent to, and be triggered by the same standards applied to herbaceous components of the plant community.

Another commenter believed that the proposed rule could result in the failure to recognize the impact of deeper rooting zones which, after 2 years of growth, may cause the trees to become stunted and die. Another commenter proposed additional language to make allowance for selective replanting of trees to ensure full stocking, but retained the basic requirement that reforestation success be based on survival of the majority of the trees in the initial planting.

These arguments have merit and OSM has adopted new language similar to that suggested by the third commenter. This new language calls for at least 80 percent of the trees and shrubs to have been in place three or more growing seasons in areas where the period of responsibility is 5 years. In areas where the period of responsibility is 10 years, at least 80 percent of the trees and shrubs must be in place eight or more growing seasons. Furthermore, no tree or shrub shall be counted when determining success if it has not been in place for at least two growing seasons. This is believed to be a reasonable compromise that will allow normal replanting if approved as a husbandry practice under final Section 816.116(c)(4) (described below) and still demonstrate successful revegetation.

One commenter wanted to know if herbicides could be used to control herbaceous cover around tree seedlings and whether such cover with spots or bands of dead grasses would be acceptable. The commenter also wanted to know what value ground cover would have where the postmining land use is forest.

The use of herbicides to control herbaceous vegetation is an effective method for assisting in the establishment of trees and shrubs. Either spot or band application is acceptable so long as the area affected is not larger than necessary to allow the trees and shrubs to become established and the soil is protected from excessive erosion. Erosion control is the main value of ground cover where the postmining land use is forest. The grasses and legumes stabilize the land until tree-crown and root closure occurs.

INDUSTRIAL, COMMERCIAL, AND RESIDENTIAL USE: Final Section 816.116(b)(4) sets minimum conditions for the reclamation of areas to be developed for industrial, commercial, and residential use. The proposed rule required sufficient ground cover to control erosion. Under the proposal, in the event the approved postmining land use was not achieved within 5 years, the general success standards of Paragraph (a) of Section 816.116 would have applied.

A commenter felt the proposed language was reasonable but could be improved by adding additional language that would make it clear that the period of responsibility will begin anew when failure to achieve industrial, commercial, and residential uses results in augmented seedings, fertilization, or other work to meet revegetation success standards. Another commenter urged deletion of Section 816.116(b)(4). The commenter contended that the section conflicted with previous 30 CFR 805.13(f), which stated that the permittee is obliged to complete the reclamation plan in such a manner that the land will be capable of supporting the approved postmining land use. The commenter also believed that the permittee cannot be held responsible for the action of third parties.

OSM has reconsidered the proposed rule in light of the second commenter's objections. Although OSM cannot require third parties to develop the reclaimed land for an industrial, commercial, or residential use, the operator is responsible for the success of reclamation, including the possible achievement of different revegetation standards under a permit revision based on a postmining land use different from the one originally approved. For this reason, OSM has decided not to adopt the proposed language and to retain the language of previous Section 816.116(b)(3)(ii). Thus, in the final rule, OSM has retained the standard which provides that, for areas to be developed as industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

REMINED AREAS: Proposed Section 816.116(b)(5) required that remined areas not initially reclaimed to the permanent program performance standards (816 or 817) must have, as a minimum, vegetative ground cover not less than can be supported by the best available soil material in the redisturbed area and not less than the ground cover that existed before redisturbance. The final rule contains the added requirement that the vegetative ground cover must be sufficient to stabilize the soil surface from erosion but does not adopt the requirement that ground cover be measured on the basis of what could be supported by the best available soil material.

One commenter felt that the changes that OSM had proposed in Section 816.116(b)(5) were minor changes which were acceptable. Other commenters wanted to retain in the final rule a provision of previous Section 816.116(b)(3)(i), which required the vegetative cover on remined areas to be adequate to control erosion. One State argued that the vegetative ground cover existing prior to redisturbance is often very sparse and inadequate to control offsite damages.

The commenter felt the proposed rule would perpetuate this condition unless language were added that would require the cover to be adequate to control erosion. A second commenter also urged the adoption of an erosion control requirement by explaining that operators would not be able to meet effluent and water quality standards required for bond release on the basis of physical manipulation alone. The establishment of a vegetative cover that is adequate to control erosion was thought necessary to improve the operator's probability of meeting the bond release requirements of Section 519(c) of the Act. Another commenter believed Section 515 (b)(2), (b)(4), and (b)(16) of the Act clearly indicated statutory support for an erosion control requirement. A final commenter thought an erosion control requirement was necessary but was unclear in his statement of the reason why.

OSM has reconsidered its proposal and agrees that the arguments presented by these commenters are valid. The cover of some mined areas is sparse or even completely absent. These areas may continue to erode and cause offsite damage. The proposed rule could have allowed such conditions to continue to occur after remining even though the operator used the best soil materials available and reestablished the same degree of cover that existed on the disturbed site. An extra step, such as the use of sewage sludge, paper mill sludge, fly ash, or other soil amendments, may be necessary to establish sufficient vegetative cover to control erosion and effectively stabilize the site. The final rule requires the vegetative ground cover to be adequate to control erosion.

One State regulatory authority contended that the provision in the proposed rule which required the ground cover not to be less than the cover that can be supported by the best available topsoil or other suitable material in the redisturbed area was not an objective, measurable standard that could be applied by a regulatory authority. The State pointed out that it is difficult to determine the degree of ground cover that the best soil material can support. As an alternative, the State suggested language that would require the ground cover to be adequate to prevent the formation of rills and gullies caused by erosion.

OSM agrees that it would be difficult to actually apply such a provision without greenhouse tests or experimental field plots, which would place an unnecessary burden on the operator and the regulatory authority. For this reason, and the fact that the final rule contains other more easily enforceable cover requirements, OSM has not adopted that portion of the provision. In any event, operators must salvage and redistribute the best available soil material for the plant growth medium as required by Section 816.22. The suggested alternative, to require cover sufficient to prevent the formation of rills and gullies, was not accepted because Section 816.95(b) adequately addresses the problem of rills and gullies.

Another State supported the proposed rule by expressing its belief that, for remined areas not previously reclaimed properly, the vegetative cover should be at least equal to that which existed before mining. It was also suggested that reclamation plans should include measures by which the most desirable strata for use as a growth medium must be recovered. The topsoil rules in Section 816.22 address operators' responsibilities concerning soil materials to be redistributed after remining. The operator must submit as part of the general reclamation plan his or her plans to remove, store, and redistribute topsoil, subsoil, and other material as required by Section 780.18(b)(4). The revegetation rules need not repeat these requirements.

Another State contended that the proposed rule limited itself to only those areas that are remined and did not adequately address redisturbances resulting from the construction of haul roads, sedimentation ponds, and other miscellaneous uses associated with coal mining. This State felt that the remining rules should cover redisturbance of any kind since there are no other revegetation performance standards that address these situations. Language was suggested which would correct this perceived omission. OSM has adopted language to clarify that Section 816.116(b)(5) applies to a redisturbance of a previously mined area resulting from any surface coal mining operation, including roads and other uses. This was intended by the proposal.

SECTION 816.116(c)

Final Section 816.116(c) describes the period of extended responsibility for successful revegetation under Section 515(b)(20) of the Act to which performance bond release is tied under Section 519(c) of the Act and under 30 CFR Part 800. This provision also implements the requirement imposed by the U.S. District Court in In re: Permanent Surface Mining Regulatory Litigation, supra, slip op., p. 61, which had been implemented in part by the suspension of a portion of previous Section 816.116(b) on August 4, 1980 *(45 FR 51549).* A new Paragraph (c)(4) is added describing the husbandry practices that may occur during the period of extended responsibility. The new paragraph is derived from previous Section 805.13(b)(3).

SECTION 816.116(c)(1)

Proposed Section 816.116(c)(1) would have required the period of responsibility for revegetation success to begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding tree and shrub planting, maintenance work, and husbandry practices that could be expected to continue as part of the postmining land use. The final rule is the same as the proposed rule with the exception that tree and shrub planting and maintenance work are not generally permitted during the responsibility period without starting the period anew. As described below, allowable husbandry practices are tied to a specific requirement that they can be expected to continue as part of the postmining land use.

A commenter stated that excluding tree and shrub planting and maintenance work from augmentative practices and allowing interseeding and supplemental fertilization during the first 5 years of the responsibility period in the West, and supplemental irrigation during the first 2 years of the responsibility period, all have significant potential for abuse and increase the likelihood that there will be vegetation failures after the bond is released. Similar concerns were expressed by a second commenter who thought the proposed rules were inconsistent with Section 515 (b)(19) and (b)(20) of the Act by effectively reducing the responsibility period for bonding by one-half for western mined lands. Another commenter was concerned that the responsibility period was shortened for success of revegetation and expressed the view that bond should not be released until a suitable time has elapsed to be sure the revegetation will be successful.

Other commenters supported the proposed rules. One individual urged the adoption of proposed Section 816.116(c) and was pleased that revegetation management and husbandry practices were finally recognized by OSM and would not act as a penalty for operators who used them. A State regulatory authority was specifically pleased with proposed Section 816.116(c)(1). Another commenter thought that the use of cultural practices, including irrigation, has merit, especially since it would not involve a restarting of the responsibility period.

The final rules do not reduce the responsibility period. While the use of certain cultural practices, such as interseeding and tree and shrub planting, could be beneficial in establishing diverse plant communities if allowed during the period of responsibility, the Act is clear that any practice that constitutes augmented seeding, fertilizing, or irrigation must be completed prior to the extended period of responsibility. The final rule has been modified accordingly. These changes and a more complete discussion of the comments received are presented below.

START OF RESPONSIBILITY PERIOD: A commenter supported the proposed changes in Section 816.116(c) regarding the start of the responsibility period for reclaimed areas. In contrast, a second commenter felt that the starting of the responsibility period for bond release after the last year of augmented seeding and fertilization rather than at the time vegetation had met the standards for success was unacceptable, especially in the arid West.

In the February 26, 1980, district court decision, cited supra, it was noted that Congress stated that, for areas where precipitation is less than 26 inches per year, "the length of time necessary to reestablish vegetation on mining spoil varies considerably * * * [and] ranges from ten years upward. Thus, the ten year standard of the bill represents a minimum time under the most favorable conditions." (H. Rept. No. 95-218, 95th Cong., 1st Sess. 109, 1977). In the court's opinion, the Act focused not on attaching a 5- or 10-year liability period after successful revegetation occurs, but directed a 5- or 10-year period to enable the coal operator to achieve successful revegetation. The court, therefore, remanded these rules and suggested that the 5- or 10-year liability period begin "after the last year of augmented seeding, fertilizing, [and] irrigation."

In response, OSM suspended the provisions of Sections 816.116(b) and 817.116(b) that started the period of responsibility at the point when the operator met the vegetation success standard *(45 FR 51548,* August 4, 1980). States were advised that they could permit the period of liability to begin from the point at which the operator completes seeding and fertilizing and that the period of liability would begin again whenever augmented seeding, fertilizing, irrigation, or other work was required or conducted on the site prior to bond release. The final rule is in agreement with the court's decision.

A commenter suggested adding language to proposed Section 816.116(c)(1) in order to clarify that the responsibility period is not restarted by supplemental fertilization and interseeding in areas of less than 26.0 inches average annual precipitation. Proposed Section 816.116(c)(3) would have allowed these practices during the first 5 years of the

responsibility period without starting the period anew. As stated elsewhere in this preamble, Section 515(b)(20) of the Act limits OSM in this regard. Thus, the final rule does not allow such practices during the period of responsibility.

THIRD PARTY RESPONSIBILITY: A commenter suggested adding language to proposed Section 816.116(c)(1) to allow responsibility during the 5- or 10-year responsibility period to be transferred to any party, such as the landowner, so long as the bonding requirements of Subchapter J are met. This commenter reasoned that some operator-landowner leases entered into before the enactment of the Act or establishment of OSM rules lack provisions establishing a time frame when landowners are to take over their property following mining and reclamation. In these cases, operators have no legal mechanism for preventing the landowner from reentering his or her property for farming or grazing prior to achievement of the revegetation standards. OSM was urged to consider a modification which would shift the burden of taking action against the landowner from the operator to the regulatory authority in situations where the landowner may use the land in a manner that jeopardizes bond release.

The Act and rules include provisions for the transfer, sale, and assignment of responsibilities under a permit. These provisions may be used to transfer responsibility if certain conditions are met and the transfer is approved by the regulatory authority. Without such an approved transfer, the operator remains responsible for revegetation success and other reclamation requirements.

SECTION 816.116(c)(2)

Proposed Section 816.116(c)(2) required the period of responsibility to continue 5 full years where the average annual precipitation is more than 26.0 inches. Vegetation parameters were to equal the approved success standard during the growing season of the last year or, if required by the regulatory authority, during the growing seasons of the last 2 years of the responsibility period. The final rule is the same as the proposed rule except for some minor changes in wording for clarity.

Two State regulatory authorities proposed that additional wording be included in Section 816.116 (c)(2) and (c)(3) to indicate that the period of responsibility must be "not less than" the appropriate 5 or 10 years. One of these States also recommended that the words "or exceed" be added to allow the permittee to be in compliance not only when the success standard is equaled, but also when it is exceeded. OSM has adopted these suggestions in the final rules because they appropriately convey the intent of the Act and remove possible differences in interpretation.

ONE- OR TWO-YEAR TEST OF SUCCESS: A commenter felt that proposed Section 816.116(c)(2) should be changed to allow the regulatory authority to accept yield and productivity documentation on either the fourth year or the fifth year in areas of more than 26 inches average annual precipitation since adverse climatic conditions, such as area-wide drought, may prevent the operators from meeting success standards during the fifth year.

Section 515(b)(20) of the Act requires operators to assume responsibility for successful revegetation for a period of 5 years. Acceptance of data for proof of reclamation success solely from the fourth year would in effect shorten the responsibility period and be inconsistent with the Act. Furthermore, data from the fourth year is more apt to reflect a carryover effect from fertilization and other practices used to initially establish the vegetative cover. Hence, the rule has been adopted as proposed.

A commenter argued that there is no statutory basis for allowing the regulatory authority the option of requiring that vegetation equal or exceed the success standard for the last 2 years of the responsibility period. The commenter alleged that the statutory obligation has been met if the operator meets the standard in the last year of the period. Another commenter thought the proposal allowing 1 year, unless the regulatory authority requires 2 years, was more practical and less burdensome than the previous rule both for regulators and operators. Two additional commenters asserted that 2 years should always be required for proof of revegetation success. One of these commenters stated that under normal circumstances there should not be any serious difficulty in attaining a vegetation standard by the fourth year and maintaining it through the fifth. The other commenter asserted that 2 years is necessary, especially where lime is used. Lime was believed to have a superficial neutralizing effect that could result in the recurrence of acid soil.

Ample justification exists for requiring 2 consecutive years of proof of revegetation success in States with pronounced year-to-year variability in climatic conditions and where success is based on crop yields or other parameters that are highly sensitive to such conditions. The decision to require 1 or 2 year's proof of performance should rest with the

regulatory authorities in those States where the annual average precipitation exceeds 26 inches. The 2-year provision may be applied selectively according to postmining land use or particular area within a State. In all instances, the last year of responsibility should be part of the 1- or 2-year test period.

A commenter was concerned that failure to meet the required standard during the last year of the responsibility period would be reason to start the responsibility period anew or for forfeiture of bond. Regulatory authorities should understand that the responsibility period continues on a year-to-year basis until the standards are satisfied. Additional language in the rule is not needed to make this clear. However, it should be pointed out that in the event augmented seeding, fertilizing, irrigation, or other work is required to obtain success, the responsibility period will start anew.

A State regulatory authority wanted additional language inserted in Section 816.116(c)(2) which would require the operator to supply the regulatory authority with documentation of revegetation success. The State felt this addition would relieve the regulatory authority from measuring every plot and allow the regulatory authority to concentrate on verifying the techniques used by the operator and the operator's results. Regulatory authorities already have the power to require operators to submit documentation of revegetation success in an application for bond release. There is no need to repeat this in the Federal revegetation rules.

SECTION 816.116(c)(3)

Proposed Section 816.116(c)(3) required the period of responsibility to continue for 10 full years where the average annual precipitation is equal to or less than 26 inches. Interseeding and supplemental fertilizing would have been allowed during the first 5 years of the responsibility period, and supplemental irrigation would have been allowed during the first 2 years of the responsibility period when needed to establish a diverse, effective, and permanent vegetative cover. Also, vegetation parameters had to equal the approved success standard for at least the last 2 consecutive years of the responsibility period.

A commenter alleged that the Act clearly states that any reseeding or refertilizing automatically restarts the liability period. The commenter pointed out that the proposed rules could result in seeding and fertilization taking place throughout the performance period, with subsequent failure of the vegetation after bond is released.

In proposing to allow tree and shrub planting during the initial portion of the responsibility period, OSM felt it important to provide operators ample time to obtain and plant the desired species and to utilize the best technology available without extending the responsibility period. However, OSM is constrained by Section 515(b)(20) of the Act to require the responsibility period to restart if augmented planting occurs. Thus in the final rule, the use of augmented seeding, fertilizing, or irrigation is not allowed during the responsibility period.

SECTION 816.116(c)(4)

Rather than interspersing in Section 816.116 (c)(2) and (c)(3) activities that an operator may engage in during the responsibility period, as was proposed, a new Section 816.116(c)(4) allows the use of certain husbandry practices during the responsibility period if approved by the regulatory authority. The purpose of this provision is to help assure revegetation success within the constraints prescribed by the Act. In essence, this is a retention of previous Section 805.13(b)(3), with a few modifications. Previous Section 805.13(b)(3) required a demonstration that discontinuance of the husbandry practices after the responsibility period expired would not reduce the probability of permanent revegetation success. Under the final rule, husbandry practices may also be approved if such practices can be expected to continue as part of the postmining land use. Such practices cannot include augmented seeding, fertilization, or irrigation without extending the period of revegetation success and bond liability.

The approved measures must be normal conservation practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area. This requirement is taken directly from previous Section 805.13(b)(3). The final rule also enumerates examples of practices that may be approved. These include disease, pest, and vermin control; and pruning, reseeding and/or transplanting specifically necessitated by such actions. Disease control was not included in previous Section 805.13(b)(3), but is included in the final rule since such actions are commonly associated with normal husbandry. The final rule deletes the reference to rills and gullies from previous Section 805.13(b)(3) since this reference could be misleading. Revised Section 816.95 *(48 FR 1160,* January 10, 1983) provides that rills and gullies that would either: (1) Disrupt the approved postmining land use or reestablishment of the

vegetative cover, or (2) cause or contribute to a violation of water quality standards for receiving streams, must be filled, regraded or otherwise stabilized; topsoil replaced; and the areas reseeded or replanted. Such rills and gullies may be indicative of a failure in the revegetation, depending on local and site-specific conditions; and may require augmented seeding to ensure revegetation success. For this reason, specific reference to regrading of rills and gullies has been deleted as an example of normal conservation practices under final Paragraph (c)(4). Under the final rule, the regulatory authority could allow repair of rills and gullies as a husbandry practice without restarting the liability period only if the general standards of this section are met after consideration of normal conservation practices within the region.

A number of comments were received on the related provisions in proposed Section 816.116(c) that would have allowed particular activities during the responsibility period. These comments are discussed below.

TREE AND SHRUB PLANTING AND MAINTENANCE WORK: Several commenters expressed the belief that tree and shrub planting and maintenance work should be restricted to the beginning of the responsibility period or identified as activities that would restart the period of responsibility. A State pointed out that the proposed rules required trees and shrubs to be in place only two growing seasons at the time of bond release. This allowed 8 years to complete the planting of trees and shrubs in arid areas and 3 years in areas of heavy rainfall. The commenter thought such periods to be excessive and stated that 2 years was sufficient time to obtain planting stock and to plant it during the proper season. Another commenter, who also felt the time period provided for tree and shrub planting was excessive, argued that 2 years was inadequate to determine the effect of unfavorable soil conditions which might be present. Older trees with more extensive root systems might come in contact with toxic materials at lower depths and become stunted or die after the release of operator responsibility. The commenter concluded that the Act clearly requires the responsibility period to start over when additional trees are planted and that OSM's rules must not conflict with the Act.

A State regulatory authority felt the replanting of trees and shrubs is not a normal practice where the postmining land use is unmanaged forest, nor is filling and seeding of rills and gullies. It was contended that these practices are augmentative and such work should cause the period of responsibility to begin anew. In contrast, another commenter favored allowing normal husbandry practices for trees and shrubs on reclaimed sites. It was argued that normal husbandry or management practices, including control of competing vegetation, are acceptable in unmined areas and should be available to the reclamation specialist.

To the extent operators are provided the opportunity to do limited replanting without starting the responsibility period anew under Section 816.116(c)(4), Section 816.116(b)(3)(ii) requires 80 percent of the planting stock to be in place for 3 or 8 years depending on the average annual precipitation and the remaining stock used in determining success to be in place for at least two growing seasons. Thus, this rule will, in effect, limit replanting to a maximum of 20 percent to the required stocking before restarting the responsibility period. Revegetation success will therefore be based on trees and shrubs that are in place an adequate time.

OSM also received several comments concerning the allowance for maintenance work during the responsibility period as provided for in the proposed rules. One commenter said that this had tremendous potential for abuse and should be deleted from Section 816.116(c)(1) unless very strict limits were set on the area over which such work could be done. As safeguards, the commenter suggested requiring operators to keep careful records of these practices and limiting the cumulative area treated to 5 percent or less of the total permit area. Where the treated area exceed 5 percent, the responsibility period should start again for the whole area or the problem area should start again for the whole area or the problem area should be separated from the rest of the permit area for bonding purposes. A State suggested limiting the filling of rills and gullies and reseeding of small spots where vegetation has failed to the first 5 years of the 10-year period of responsibility. This would allow adequate time for the permittee to stabilize and revegetate the area and leave 5 years for the vegetation to develop.

OSM agrees that allowing unlimited areas to be reseeded following the repair of rills and gullies without restarting the period of responsibility could lead to abuse of the revegetation success standards because any failure of revegetation could be accompanied by the creation of rills and gullies requiring repair. To limit the potential abuse, under final Section 816.116(c)(4), the repair of rills and gullies including reseeding or transplanting, can occur without extending the period of responsibility for revegetation success only if it is a normal conservation practice in the region, and such actions can be expected to continue as part of the postmining land use or if discontinuance will not reduce the probability of permanent revegetation success. OSM has not adopted the 5 percent standard since any nationwide numerical standard would be unrelated to the normal conservation practices in the different regions of the country.

A commenter asserted that allowing maintenance work throughout the responsibility period defeats the intent of the responsibility period. The provision allowing maintenance work contained in the proposed rule has not been included in the final rule. The proposed term "maintenance work" was too broad in meaning and its use in the rules could have resulted in conflicting interpretations, some of which could be prohibited by the Act. By allowing husbandry practices that can be expected to continue as part of the postmining land use, operators will have sufficient latitude to assure vegetation success.

A State regulatory authority suggested adding language to Section 816.116(c)(1) to allow the regulatory authority to determine which husbandry practices are normally practiced in the region for the postmining land use. Under the final rule, the regulatory authority must decide which husbandry practices are acceptable. The rule provides the basis upon which such decision must be made. In the event the husbandry practice cannot be reasonably expected to continue after bond release or if its discontinuance following bond release will reduce the probability of permanent revegetation success, the regulatory authority must deny approval or restart the period of responsibility for the operator.

A commenter said good husbandry practices would be acceptable if reseeding, refertilizing, and irrigation were clearly excluded. The final rules exclude augmented refertilizing and irrigation, and reseeding is allowed only under limited circumstances.

PREVIOUS SECTION 816.116(c)

OSM has removed previous Section 816.116(c), which required operators to maintain necessary fences, use proper management practices, and conduct periodic measurements of vegetation, soils, and water as prescribed or approved by the regulatory authority for identifying conditions during the period of responsibility.

A commenter felt that the requirements of previous Section 816.116(c) should be maintained. Similarly, other commenters contended that requiring the maintenance of fences and the use of proper management practices is appropriate and necessary for ensuring the success of revegetation and that the requirement to monitor vegetation, soils, and water is necessary to make sure that adequate progress is made toward meeting success standards.

Another commenter argued that fence maintenance and proper management practices are needed to ensure that standards generated from reference areas are valid. This commenter viewed the monitoring provisions of previous Section 816.116(c)(2) as absolutely essential. This commenter also contended that, since reclamation is more of an art than a science, monitoring is usually the only means of verifying and refining the reclamation plan.

As previously stated in the preamble to the proposed rules *(47 FR 12599)*, these provisions are not specifically required by the Act and can be provided for by the regulatory authority, if appropriate, according to the local conditions. Operators must take the actions necessary to achieve successful reclamation, including the possible maintenance of fences and performance of management practices. That is, if fencing is necessary to avoid destructive grazing or indiscriminate use of recreation vehicles on the revegetated area, then the operator is expected to construct and maintain a fence. If a regulatory authority approves the use of reference areas, then it should include provisions in its rules that address fencing and the use of proper management practices necessary to assure that reference-area data are valid and appropriate for determining the success of revegetation.

Similarly, regulatory authorities are not precluded from requiring the monitoring of revegetation efforts to assure that the reclamation plan is being followed and that the revegetation effort is progressing in a satisfactory manner. Likewise, operators may do so on their own.

PREVIOUS SECTIONS 816.116(b)(2) and 816.116(d)

Previous Section 816.116(b)(2) listed data sources and specific procedures for determining average annual precipitation. OSM proposed the removal of this section because it was primarily a listing of information sources and not deemed necessary to understanding the regulatory requirement. No specific comments were received on this proposed deletion. Therefore, OSM has omitted these provisions from the final rules.

Previous Section 816.116(d) provided an alternative fixed standard for determining the success of revegetation when permit areas are 40 acres or less in size and in locations with an average annual precipitation of more than 26 inches. OSM proposed deleting this section because it believed the flexibility generally provided to regulatory authorities by proposed Section 816.116(a) obviated the need for a specific fixed standard for small permit areas. No comments were received on the basic proposal for removing the section; however, one commenter noted the deletion would also remove previous Section 816.116(d)(3), which contained the only definition in the rules for ground cover. Ground cover was defined as the area of ground covered by the combined aerial parts of vegetation and litter that is produced naturally onsite, expressed as a percentage of the total area of measurement. This definition is retained in the final rules, but is moved to 30 CFR 701.5, Definitions.

PREVIOUS SECTION 816.117 - REVEGETATION: TREE AND SHRUB STOCKING FOR FOREST LAND

OSM proposed to remove Section 816.117, which established requirements for tree and shrub stocking on forest land. OSM stated that a separate section with revegetation success standards for forest postmining land uses was unnecessary and that the essential requirements of previous Section 816.117 could be incorporated into Section 816.116, Revegetation: Standards of success. This was proposed in Section 816.116(b)(3). No comments were received that either supported or opposed this reorganization of the rules. Therefore, the final rule removes Section 816.117 and transfers the essential requirements for tree and shrub stocking to Section 816.116(b)(3). Comments received on the proposed language were previously discussed under the heading "Forest, Wildlife Habitat, and Recreation areas."

SECTIONS 817.111-817.116 - REVEGETATION PERFORMANCE STANDARDS -- UNDERGROUND MINING

Proposed Sections 817.111-817.116 establishing revegetation performance standards for underground mining activities. With the exception of Section 817.111, these sections were identical to the corresponding sections proposed in Part 816. Proposed Section 817.111 reflected differences in the statutory language of Section 515(b)(19) of the Act for surface mining activities and Section 516(b)(6) is essentially the same as Section 515(b)(19). However, Section 516(b)(6) does not use the term "effective" in describing the vegetative cover requirements. Also, there is no statutory language restricting the use of introduced species and requiring vegetation of the same seasonal variety.

A State regulatory authority pointed out that proposed Section 817.111(a)(1) did not contain the term "effective" and said the word should not be eliminated from the performance standards for underground mining activities. This proposed deletion was also noted by a second commenter who appeared to seek its inclusion in the final rule. Specific reasons were not given for the position taken by the commenters.

A State regulatory authority also noted that the proposed changes to Sections 817.111 (a) and (b) would eliminate the emphasis given in previous Section 817.111(b)(1) to native plants of the same seasonal variety. The commenter contended that the use of native, locally adapted plant species was vital to successful revegetation, particularly under arid and semiarid conditions. Accordingly, the commenter believed that this requirement should not be eliminated from the rules.

In considering these comments, OSM has reviewed the Act and its legislative history to determine if the differences in Sections 515(b)(19) and 516(b)(6) were intended to reflect actual or perceived differences in surface and underground mining activities. OSM has not identified any differences that support adopting revegetation rules for surface mining activities that differ from rules adopted for underground mining activities. Therefore, in the final rules the revegetation performance standards in Part 816 and Part 817 are identical.

C. REFERENCES

Technical literature used to develop these final rules was cited in the March 23, 1982, issue of the Federal Register *(47 FR 12601)*. The following technical literature, not previously cited, was also used in the preparation of these final rules. All of the reports are on file in OSM's Administrative Record.

Bonham, C. D., Larson, L. L., and Morrison, A., 1980, A survey of techniques for measurement of herbaceous and shrub production, cover, and diversity in the West: Unpublished, report prepared for the Office of Surface Mining, 79 pp.

Farmer, R. E., Jr., Rennie, J. C., Scanlon, D. H., III, and Zarger, T. G., 1981, Technical guides on use of reference

areas and technical standards for evaluating surface mine vegetation in OSM Regions I and II. Prepared by the Tennessee Valley Authority for the Office of Surface Mining. Contract J5701442, 82 pp.

Gilley, J. E., Gee, G. W., Bauer, A., Willis, W. O., and Young, R. A., 1977, Runoff and erosion characteristics of surface mined sites in western North Dakota: Trans., ASAE 20(4): 697-700, 704.

Larson, L. L., 1980, A statistical evaluation of revegetation success on coal lands in the West: Unpublished, report prepared for the Office of Surface Mining, 19 pp.

National Research Council, 1981, Surface mining: Soil, coal, and society: National Academy Press, Washington, D.C.

Oleson, A. L., 1981, Methods for measuring percent ground cover: U.S. Department of Agriculture, Soil Conservation Service, Northeast Technical Service Center, Technical Note, Agronomy No. 17, 4 pp.

Raelson, J. V., and McKee, G. W., 1982, Measurement of plant cover to evaluate revegetation success: The Pennsylvania State University, Dept. of Agronomy, Agronomy Series 67, 45 pp.

Slick, B. M., N. D., (in press), A guide for the use of organic materials as mulches in reclamation of coal minesoils in the Eastern United States: U.S. Department of Agriculture, Forest Service, General Technical Report, 351 pp.

Thornburg, A. A., 1982, Plant materials for use on surface mined lands in arid and semiarid regions: U.S. Department of Agriculture, Soil Conservation Service, SCS-TP-157.

U.S. Department of Agriculture, 1963, Sixteen plants poisonous to livestock in the Western States: Farmers' Bulletin 2106.

U.S. Department of Agriculture, 1959, Techniques and methods of measuring understory vegetation: Proceedings of a symposium at Tifton, Georgia, October 1958, 174 pp.

U.S. Forest Service, 1937, Range plant handbook: U.S. Department of Agriculture.

Vogel, W. G., 1981, A guide for revegetating coal minesoils in the Eastern United States. U.S. Department of Agriculture, Forest Service, General Technical Report NE-68.

III. PROCEDURAL MATTERS

Executive Order 12291 and the Regulatory Flexibility Act

The Department of the Interior (DOI) has determined that this rule is not a major rule requiring a regulatory impact analysis under Executive Order 12291. Also, DOI certifies that this rule will not have a significant economic effect on a substantial number of small entities and, therefore, does not require a regulatory flexibility analysis under Pub. L. 95-354. These rules, by emphasizing performance standards instead of design criteria, will allow small coal operators increased flexibility and should especially ease the regulatory burden on small coal operators in Appalachia.

Paperwork Reduction Act

OSM has received approval from the Office of Management and Budget under *44 U.S.C. 3507* for the information collection requirements in Parts, 816 and 817 and have been assigned clearances Nos. 1029-0047 and 1029-0048. These approvals have been codified under Sections 816.10 and 817.10. However, there are no information collection requirements in the revegetation rules, Sections 816.111-816.116 and 817.111-817.116.

National Environmental Policy Act

OSM has analyzed the impacts of these final rules in its "Final Environmental Impact Statement OSM-EIS-1: Supplement" (FEIS) according to Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA) *(42 U.S.C. 4332*(2)(C)). The FEIS is available in OSM's Administrative Record, Room 5315, 1100 L Street, NW., Washington, D.C., or by mail request to Mark Boster, Chief, Branch of Environmental Analysis, Office of Surface Mining, Department of the Interior, Room 134, Interior South Building, U.S., 1951 Constitution Ave., NW., Washington, D.C. 20240. This preamble serves as the record of decision under NEPA. The final rules are different from

those contained in Volume III of the FEIS in the following respects:

1. Final Sections 816.111(a) and 817.111(a) apply to "disturbed areas" rather than "affected lands." For the reasons described earlier in this preamble, this change does not affect the FEIS analysis.

2. Final Sections 816.116(c) and 817.117(c) do not allow tree and shrub planting during the first 2 years of the period of responsibility in areas of more than 26 inches average annual precipitation and do not allow interseeding, tree and shrub planting, fertilizing, or irrigation during the first 2 years of the period of responsibility in areas of 26 inches or less average annual precipitation. In this respect, the final rules are consistent with the no action/minimum action Alternative B in the FEIS.

3. The final rules add a provision allowing regulatory approval of certain husbandry practices. These would have been allowed under draft final Section 816.116(c)(1) and thus are considered within the FEIS analysis.

Agency Approval

Section 516(a) of the Act requires that, with regard to rules directed toward the surface effects of underground mining, OSM must obtain written concurrence from the head of the department which administers the Federal Mine Safety and Health Act of 1977, the successor to the Federal Coal Mine Health and Safety Act of 1969. OSM has obtained the written concurrence of the Assistant Secretary for Mine Safety and Health, U.S. Department of Labor.

LIST OF SUBJECTS

30 CFR Part 701

Coal mining, Law enforcement, Surface mining, Underground mining.

30 CFR Part 816

Coal mining, Environmental protection, Reporting and recordkeeping requirements, Surface mining.

30 CFR Part 817

Coal mining, Environmental protection, Reporting and recordkeeping requirements, Underground mining.

Accordingly, 30 CFR Parts 701, 816, and 817 are amended as set forth herein .

Dated: August 29, 1983.
William P. Pendley, Deputy Assistant Secretary, Energy and Minerals.

PART 701 -- PERMANENT REGULATORY PROGRAM

1. Section 701.5 is amended by adding a definition of "ground cover" in alphabetical order to read as follows:

SECTION 701.5 - DEFINITIONS.

* * * * *

GROUND COVER means the area of ground covered by the combined aerial parts of vegetation and the litter that is produced naturally onsite, expressed as a percentage of the total area of measurement.

* * * * *

PART 816 -- PERMANENT PROGRAM PERFORMANCE STANDARDS -- SURFACE MINING ACTIVITIES

2. Section 816.111 is revised to read as follows:

SECTION 816.111 - REVEGETATION: GENERAL REQUIREMENTS.

(a) The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is --

(1) Diverse, effective, and permanent;

(2) Comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the regulatory authority;

(3) At least equal in extent of cover to the natural vegetation of the area; and

(4) Capable of stabilizing the soil surface from erosion.

(b) The reestablished plant species shall --

(1) Be compatible with the approved postmining land use;

(2) Have the same seasonal characteristics of growth as the original vegetation;

(3) Be capable of self-regeneration and plant succession;

(4) Be compatible with the plant and animal species of the area; and

(5) Meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

(c) The regulatory authority may grant exception to the requirements of Paragraphs (b)(2) and (b)(3) of this section when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

(d) When the regulatory authority approves a cropland postmining land use, the regulatory authority may grant exception to the requirements of Paragraphs (a)(1), (a)(3), (b)(2), and (b)(3) of this section. The requirements of Part 823 of this chapter apply to areas identified as prime farmland.

SECTION 816.112 [Removed]

3. Section 816.112 is removed.

4. Section 816.113 is revised to read as follows:

SECTION 816.113 - REVEGETATION: TIMING

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

5. Section 816.114 is revised to read as follows:

SECTION 816.114 - REVEGETATION: MULCHING AND OTHER SOIL STABILIZING PRACTICES.

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The regulatory authority may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

SECTION 816.115 [Removed]

6. Section 816.115 is removed.

7. Section 816.116 is revised to read as follows:

SECTION 816.116 - REVEGETATION: STANDARDS FOR SUCCESS.

(a) Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements of Section 816.111.

(1) Standards for success and statistically valid sampling techniques for measuring success shall be selected by the regulatory authority and included in an approved regulatory program.

(2) Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters or ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when they are not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., one-sided test with a 0.10 alpha error).

(b) Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

(1) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be least equal to that of a reference area or such other success standards approved by the regulatory authority.

(2) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the regulatory authority.

(3) For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows:

(i) Minimum stocking and planting arrangements shall be specified by the regulatory authority on the basis of local and regional conditions and after consultation with the State agencies responsible for the administration of forestry and wildlife programs.

(ii) Trees and shrubs that will be used in determining the success of stocking and the adequacy of plant arrangement shall have utility for the approved postmining land use. At the time of bond release, such trees and shrubs shall be healthy, and at least 80 percent shall have been in place for a least three growing seasons in areas with a 5-year period of responsibility and at least eight growing seasons in areas with a 10-year period of responsibility. No trees and shrubs in place for less than two growing seasons shall be counted in determining stocking adequacy.

(iii) Vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

(4) For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

(5) For areas previously disturbed by mining that were not reclaimed to the requirements of this subchapter and that are remined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

(c)(1) The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the regulatory authority in accordance with paragraph (c)(4) of this section.

(2) In areas of more than 26.0 inches average annual precipitation, the period of responsibility shall continue for a period of not less than 5 full years. Vegetation parameters identified in paragraph (b) of this section shall equal or exceed the approved success standard during the growing season of the last year of the responsibility period or, if required by the regulatory authority, during the growing seasons of the last 2 years of the responsibility period.

(3) In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than 10 full years. Vegetation parameters identified in paragraph (b) of this section shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

(4) The regulatory authority may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal conservation practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding and/or transplanting specifically necessitated by such actions.

SECTION 816.117 [Removed]

8. Section 816.117 is removed.

PART 817 -- PERMANENT PROGRAM PERFORMANCE STANDARDS -- UNDERGROUND MINING ACTIVITIES

9. Section 817.111 is revised to read as follows:

SECTION 817.111 - REVEGETATION: GENERAL REQUIREMENTS.

(a) The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, as vegetative cover that is in accordance with the approved permit and reclamation plan and that is --

(1) Diverse, effective, and permanent;

(2) Comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the regulatory authority;

(3) At least equal in extent of cover to the natural vegetation of the area; and

(4) Capable of stabilizing the soil surface from erosion.

(b) The reestablished plant species shall --

(1) Be compatible with the approved postmining land use;

(2) Have the same seasonal characteristics of growth as the original vegetation;

(3) Be capable of self-regeneration and plant succession;

(4) Be compatible with the plant and animal species of the area; and

(5) Meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

(c) The regulatory authority may grant exception to the requirements of paragraphs (b)(2) and (b)(3) of this section when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

(d) When the regulatory authority approves a cropland postmining land use, the regulatory authority may grant exceptions to the requirements of paragraphs (a)(1), (a)(3), (b)(2), and (b)(3) of this section. The requirements of Part 823 of this chapter apply to areas identified as prime farmland.

SECTION 817.112 [Removed]

10. Section 817.112 is removed.

11. Section 817.113 is revised to read as follows:

SECTION 817.113 - REVEGETATION: TIMING.

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

12. Section 817.114 is revised to read as follows:

SECTION 817.114 - REVEGETATION: MULCHING AND OTHER SOIL STABILIZING PRACTICES.

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The regulatory authority may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

SECTION 817.115 [Removed]

13. Section 817.115 is removed.

14. Section 817.116 is revised to read as follows:

SECTION 817.116 - REVEGETATION: STANDARDS FOR SUCCESS.

(a) Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements of Section 817.111.

(1) Standards for success and statistically valid sampling techniques for measuring success shall be selected by the regulatory authority and included in an approved regulatory program.

(2) Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when they are not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., a one-sided test with a 0.10 alpha error).

(b) Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

(1) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the regulatory authority.

(2) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that of a reference areas or such other success standards approved by the regulatory authority.

(3) For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation, shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows:

(i) Minimum stocking and planting arrangements shall be specified by the regulatory authority on the basis of local and regional conditions and after consultation with the State agencies responsible for the administration of forestry and wildlife programs.

(ii) Trees and shrubs that will be used in determining the success of stocking and the adequacy of plant arrangement shall have utility for the approved postmining land use. At the time of bond release, such trees and shrubs shall be healthy, and at least 80 percent shall have been in place for at least three growing seasons in areas with a 5-year

period of responsibility and at least eight growing seasons in areas with a 10-year period of responsibility. No trees and shrubs in place for less than two growing seasons shall be counted in determining stocking adequacy.

(iii) Vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

(4) For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

(5) For areas previously disturbed by mining that were not reclaimed to the requirements of this subchapter and that are remined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

(c)(1) The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the regulatory authority in accordance with paragraph (c)(4) of this section.

(2) In areas of more than 26.0 inches average annual precipitation, the period of responsibility shall continue for a period of not less than 5 full years. Vegetation parameters identified in paragraph (b) of this section shall equal or exceed the approved success standard during the growing season of the last year of the responsibility period or, if required by the regulatory authority, during the growing seasons of the last 2 years of the responsibility period.

(3) In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than 10 full years. Vegetation parameters identified in paragraph (b) of this section shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

(4) The regulatory authority may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal conservation practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding and/or transplanting specifically necessitated by such actions.

SECTION 817.117 [Removed]

15. Section 817.117 is removed.

(Pub. L. 95-87, *30 U.S.C. 1201* et seq.)

[FR Doc. 83-24079 Filed 9-1-83; 8:45 am]
BILLING CODE 4310-05-M