FEDERAL REGISTER: 48 FR 32910 (July 19, 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; Excess Spoil Fills

ACTION: Final rule.

SUMMARY: The Office of Surface Mining Reclamation and Enforcement (OSM) is amending its rules dealing with the requirements for disposal of excess spoil from surface and underground mining activities. The final rules set out four sections to cover general requirements, head-of-hollow/valley fills, durable rock fills, and preexisting benches. They eliminate the information that was duplicated in each previous section, allow more flexibility in the design of excess spoil fills, and remove those provisions that are excessive, unnecessary and burdensome.

EFFECTIVE DATE: August 18, 1983.

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SUPPLEMENTARY INFORMATION:

I. BACKGROUND

Spoil disposal practices in surface mining over the years have had a major impact on the environment. Prior to the passage of the Surface Mining Control and Reclamation Act of 1977, *30 U.S.C. 1201* et seq. (the Act), mine operators in steep slope areas often disposed of overburden material by pushing it downslope of the bench. The practice destroyed vegetation and caused erosion, slides and increased sedimentation of streams. To rectify this problem, Section 515(b)(22) of the Act required the controlled placement of all excess spoil material from surface coal mining operations using sound engineering practices to ensure the long term stability of the fill.

Rules concerning the disposal of excess spoil were proposed on September 13, 1978 *(43 FR 41890-41892 and 41910-41912)* and promulgated as final on March 13, 1979 *(44 FR 15406-15408 and 15432-15434).* These previous rules included general requirements on the disposal of excess spoil in Sections 816.71 and 817.71, and more specific requirements for valley fills, head-of-hollow fills and durable rock fills, respectively, in Sections 816.72 and 817.72, 816.73 and 817.73, and 816.74 and 817.74.

Since the publication of the permanent program rules on excess spoil material in 1979, there have been two additions to the rules. First, Sections 816.71(o) and 817.71(o) were added as final rules on July 17, 1981 *(43 FR 37231-37235)* to allow the controlled gravity transport of excess spoil from an actively mined upper bench to an existing lower bench. Second, Sections 816.75 and 817.75, which allow the disposal of excess spoil on preexisting benches, were proposed in the Federal Register on July 20, 1981, *(46 FR 37286)* and promulgated as final on April 29, 1982 *(47 FR 18553-18555).*

These final rules set out four sections to cover general requirements, head-of-hollow/valley fills, durable rock fills, and preexisting benches. They eliminate the information that was duplicated in each previous section, allow more flexibility in the design of excess spoil fills, and remove those provisions that are excessive, unnecessary and burdensome. All engineering designs, however, will still have to meet the requirements of the Act and the approved regulatory program, and be approved by the appropriate regulatory authority.

On June 8, 1982 *(47 FR 24954),* OSM published a notice of proposed rulemaking to amend 30 CFR Parts 701, 816 and 817 relating to disposal of excess spoil. No public hearings were requested. A public meeting was held in Washington, D.C. on July 28, 1982. The comments received at the meeting are addressed in this preamble. During the

comment period, June 8, 1982, to August 25, 1982, OSM received numerous comments from State agencies, industry and environmental groups. The comment period was extended through September 10, 1982, primarily for admission of comments received at congressional hearings.

II. DISCUSSION OF COMMENTS AND RULES ADOPTED

A. GENERAL COMMENTS

Elimination of design requirements. The majority of commenters agreed with OSM's efforts to remove burdensome and excessive requirements and the stringent design standards in the previous rules to allow greater flexibility and more innovative designs by the professional engineering community. Some commenters characterized OSM's effort as being realistic and cognizant of the diversity of environmental conditions, the varying characteristics of the materials to be disposed, the ability of engineers to develop functional, economical designs and the inherent responsibility of the State to regulate.

In support of the concept to remove restricting design standards, one commenter quoted an OSM sponsored study, "Disposal of Excess Spoil from Coal Mining and the Surface Mining Control and Reclamation Act of 1977," produced in 1981 by the National Academy of Sciences' Commission on Natural Resources. This study questioned the previous rules for failing to recognize the diversity and complexities of the environmental systems, for creating design standards that are impractical to enforce, for producing inequity of economic impact, for raising reclamation costs beyond what is necessary and for being more stringent than the Act.

Two commenters voiced a contrary opinion and strongly rejected the idea of eliminating design standards. One of the commenters warned that placing too much reliance on performance standards may result in an operator's failure to perform not being identified until environmental damage has occurred. The commenter said the operator could also find correcting the problem unnecessarily costly. In certain instances, the commenter said, a design requirement may have prevented the damage from occurring.

The other commenter felt many adverse impacts would be caused by elimination of design standards especially for excess spoil fills. The commenter felt that unstable excess spoil fills would be constructed using the end dumping technique and that certification by a registered professional engineer would not protect the health and safety of the public. The commenter said the need for specific design standards to achieve uniformity and assure long-term stability, as well as protection of streams and the public, is becoming even more evident as the increased sizes of excess spoil fills complicates the engineering requirements.

These final rules emphasize the use of performance standards rather than design standards. Certain design criteria, however, have continued to be used where deemed appropriate. The use of design standards alone cannot ensure the construction of a safe and environmentally sound fill. In fact, design standards generally fail to consider site-specific conditions and thus are often as likely to result in under design as over design of the fill.

The intent of these rules is to not constrain the engineer with a design standard that may be totally inappropriate for the site-specific environmental conditions, or that is unnecessary or unworkable. With the safeguards of performance standards, certification by qualified engineers, design and foundation analyses prior to permitting, regular inspection during construction and at completion by the engineer and the State, performance bonds, and OSM oversight of the State's regulatory performance, an excess spoil fill can be properly and safely designed and constructed to protect the public and the environment. These rules emphasize those considerations necessary for proper design and construction of the fill rather than imposing arbitrary design standards that cannot be expected to cover every extenuating circumstance or every environmental situation. Individual State regulatory authorities may supplement these regulations with additional design standards should they find them desirable to their particular environmental conditions. A further discussion of the use of performance standards rather than design criteria appears in the "Final Environmental Impact Statement OSM EIS-1: Supplement, " Volume I, pp. II 7-8 and IV 5-7.

The majority of commenters agreed with the proposal to revise the excess spoil rules. While the renumbering and combining of sections in the new excess spoil rules may cause some initial confusion, in most cases the new rules will not cause the design and construction of excess spoil facilities to differ much from previous operations. This final rule adopts the proposed rule with some modifications for clarity. These changes are discussed further in this preamble.

Two commenters objected to OSM's proposed rules for excess spoil fills because in their opinion they failed to be supported by enough data and lacked research on the environmental and economical impact of their adoption. One of these commenters opposed the proposed rules because they failed to correct a number of problems with the previous rules that were examined in the National Academy of Sciences' 1981 study and because the proposed rules left the operators totally at the "mercy" of the regulatory authority.

An industry commenter wanted the previous rules for excess spoil fills to be retained because he felt the proposed rules would create additional costs for his company and the public without improving the protection of the environment. The commenter did not elaborate as to how this might occur.

Several other commenters felt the OSM proposal confused the rules for disposal of excess spoil and recommended retention of the previous rules. The commenters said although there were a few things they would like changed, the previous rules were acceptable to the States, industry and the environmentalists and were proven in the field to be environmentally and operationally sound. Several commenters also noted that the previous excess spoil rules had never been challenged in court by industry or the environmental community.

These commenters all had one similar objection regarding the proposed rules- OSM's apparent elimination of a separate section on durable rock fills.

It was not OSM's intention to eliminate, outlaw or prohibit disposal of durable rock by controlled gravity placement. OSM recognizes that the manner in which the previous durable rock fill rules of Section 816.74 were consolidated into the proposed section was confusing. OSM has made changes to correct the misunderstanding and discussion of these changes is found in the preamble for final Section 816.73 Durable rock fills.

B. DEFINITIONS

EXCESS SPOIL. Before spoil can be moved from the mined-out area to an excess spoil fill, the operator must meet the approximate original contour (AOC) restoration and highwall elimination requirements, or fall within variances thereto, in Sections 515 and 516 of the Act and in Sections 816.102-816.107 and 817.102-817.107. The excess spoil is then subject to the requirements of Section 515(b)(22) of the Act and the provisions of Sections 816.71-816.74 and 817.71-817.74. This final rule defines excess spoil and provides standards for its disposal.

Proposed Section 701.5 would have defined "excess spoil" to mean "spoil material disposed of in a location other than the mined out area, except material used to blend spoil from the mined out area with the surrounding terrain after achieving the approximate original contour (AOC) in nonsteep slope areas." In the preamble to the proposed rule, OSM also requested comments on whether excess spoil should simply be defined as any spoil not required to return the mined-out area to AOC, without regard to "where" the spoil is deposited.

One commenter felt these two defining phrases should be combined and offered the following version: "Excess spoil means spoil material which is not required to achieve the approximate original contour or used to achieve the approved postmining land configuration and is disposed of in a location other than the mined out area, except * * *" Another commenter felt that "where" the spoil is deposited should be the primary concern. A third commenter preferred defining excess spoil as "that not required for AOC." The proposed definition, the commenter said, was vague and open to potential abuse.

OSM agrees with the commenter who felt that the location of the disposal site was the most important factor and has retained the language of the proposed definition with minor revision, in the final rule. In recognition of the fact that Congress has authorized variances from the AOC restoration requirement the final rule does not specify that excess spoil be spoil in excess of that required to achieve the approximate original contour. Authorized variances from AOC would make the spoil, normally required to restore AOC, excess spoil (e.g., mountaintop removal mining). The final rule specifically recognizes, however, that spoil used to achieve AOC is not excess spoil.

In the final rule, spoil used to merely blend the mined out area with the surrounding terrain need not be treated as excess spoil. Thus, spoil from box cuts or first cuts in nonsteep slope areas would not be excess spoil when it is used to achieve approximate original contour, i.e., to blend the mined-out area into the surrounding terrain according to Section

816.102 of the backfilling and grading rules. Even though the spoil in these cases is disposed of in a location other than the mined out area, specifically around the box cut or first cut to blend it into the terrain, the rules for excess spoil would not be applicable. Rather, the standards for backfilling and grading would govern. The reference to the standards of Section 816.102 has been added to the definition in the final rule for clarity. If, however, the spoil from a box cut or a first cut is deposited on slopes with angles defined as steep slopes, the box cut or first cut spoil must be handled as excess spoil in accordance with Sections 816.71 and 817.71. This complies with Section 515(d) of the Act.

Several commenters agreed with OSM's decision to exclude spoil used to blend the mined out area into the surrounding terrain from being considered as excess spoil.

One commenter suggested an editorial change that would delete the terms "spoil from" from the definition of excess spoil to prevent the possibility of a misinterpretation between excess spoil and material used to backfill the mined-out area. The commenter's suggestion would have the definition read: "Spoil material used to blend the mined out area with the surrounding terrain." OSM is accepting this comment and the definition has been changed accordingly.

HEAD-OF-HOLLOW FILLS/VALLEY FILLS. This final rule revises the definition of head-of-hollow fill by deleting the special exemption for fills less than 250,000 cubic yards and the restrictions in the definitions of head-of-hollow fill and valley fill prohibiting placement of coal mine waste in fills.

One commenter asserted that by deleting the exemption for fills of less than 250,000 cubic yards from the definition of head-of-hollow fills, OSM eliminated the performance requirements for fills less than 250,000 cubic yards of material. The commenter further asserted that this change would result in a proliferation of small fills that fail to meet any comprehensive permitting and performance standards.

The previous definition of "head-of-hollow" fills gave an exemption to fills less than 250,000 cubic yards, allowing these smaller volume fills to be built to the level of the coal seam and not the top of the ridge. The exemption is discussed in detail in the Federal Register preamble dated March 13, 1979 *(44 FR 15207)*. The final definition deletes this exemption and defines all head-of-hollow fills, regardless of volume, as fills that reach the top of the ridge. The commenter is incorrect in asserting that this then leaves no standards that will apply to fills that do not reach the ridgelines. Under the revised rule all fills in a drainage course in steep slope areas that do not reach the top of the ridge, regardless of their location, will be considered valley fills. Further, all excess spoil fills must meet the performance standards in Section 816.71 regardless of their size and/or location.

One commenter suggested that the term "point" be changed to "profile" in the definitions for head-of-hollow and valley fills. The commenter felt the term "profile" is more appropriate and consistent with the measuring method.

OSM believes the term "point" is properly used in this definition. The term "profile" is included in the definition with respect to slope of the valley from the toe of the fill to the top of the fill. To include the term "profile" as suggested by the commenter may lead to misunderstandings. "Profile" is used to mean a generally continuous topographic cross-section; while "point" is used in the head-of-hollow/valley fill definitions to refer to the angle of the slope at a particular location along that profile.

UNDERGROUND DEVELOPMENT WASTE. Final Section 701.5 revises the definition of underground development waste by deleting the previous reference to surface excavations and applying the term solely to material extracted from underground workings. The definition of underground development waste will include only rock mixtures that come from the excavation of underground workings associated with this definition and the proposed definition has been adopted with the exception that the wording is revised to more clearly reflect the intent to apply to material excavated in the development of underground workings. The definition includes material excavated in the development of drifts, shafts, and adits.

C. FINAL RULES FOR THE DISPOSAL OF EXCESS SPOIL

SECTIONS 816.71-816.74 and 817.71-817.74

Previous Sections 816.71-816.75 and Sections 817.71-817.75 read essentially the same, except that the sections from Part 816 referred to surface mining and the sections from Part 817 referred to underground mining. Under this

rulemaking the final sections of Parts 816 and 817 on disposal of excess spoil will continue to read essentially the same.

To simplify this preamble, OSM will discuss the comments and rules of final Sections 816.71-816.74 with the understanding that the discussion will also apply to final Sections 817.71-817.74. The only difference to be noted between final Sections 816.71 and 817.71 is an additional paragraph (k) in Section 817.71. Section 817.71(k), formerly the first sentence of proposed Section 817.71(a), is discussed later in the preamble under the heading, Section 817.71 Underground mining activities.

In response to comments, the final excess spoil rules have been reorganized and clarified to eliminate the confusion over durable rock fills, rock core chimney drains and the requirement to qualify engineering experience. It was also decided that for clarity the excess spoil rules should be set out in several sections rather than consolidated into one section (Section 816.71) as was proposed.

The final excess spoil rules are contained in the following four sections: Section 816.71 General requirements, Section 816.72 Valley fills/Head-of-hollow fills, Section 816.73 Durable rock fills, and Section 816.74 Preexisting benches. This new organization will make it easier for the reader to find the appropriate subject.

To assist the reader in understanding the changes in the final rules, the following Derivation Table shows the relationship of the final rules to the previous sections and the proposed sections. The same changes apply for Part 817-Underground mining activities.

DERIVATION TABLE -- EXCESS SPOIL RULES

Final rule	Previous sections	Proposed section
Section 816.71		
(a)	816.71(a)	(a)(1).
(a)(1)	816.71(a)(1)	(a)(1)(i).
(a)(2)	816.71(a)(2), (f); 816.72(c); 816.74(a)(1)	(a)(3).
(a)(3)	816.71(a)(3)	(a)(1)(iii).
(b)(1)	816.71(b)	(a)(2).
(b)(2)	816.71(f), (m)	(a)(1)(ii), (a)(2).
(c)	816.71(e)	(b)(3).
(d)(1)	816.71(m)	(a)(2).
(d)(2)	816.71(i)	(b)(4).
(e)(1)	816.71(c)	(a)(5).
(e)(2)	816.71(f); 816.72(c); 816.74(a)(1)	(a)(3).
(e)(3)	816.71(g), (h); 816.72(g); 816.74(g), (g)(1)	(a)(8), (b)(6), & (b)(6)(i).
(e)(4)	816.71(g)	(b)(5).
(e)(5)		816.102(e).
(f)(1)	816.71(d)(1)	(a)(7), (b)(1).
(f)(2)	816.71(d); 816.72(d); 816.74(d)	(a)(6).
(f)(3)	816.71(1); 816.72(b)(2 & 4); 816.74(c)	(b)(1).
(g)	816.71(d)	(a)(6).
(h)	816.71(j)	(a)(4).
(h)(1)	816.71(j)	(a)(4).
(h)(2)	816.71(j)	(a)(4).
(h)(3)	816.71(j)	(a)(4).
(h)(4)	816.71(j)	(a)(4).
(i)	816.71(k)	(a)(9).
(i)(1)	816.71(k)(1)	(a)(9)(i).
(i)(2)	816.71(k)(2)	(a)(9)(ii).
(i)(3)	816.71(k)(3)	(a)(9)(iii).
(j)	816.71(n)	(a)(11).
(k) [817.71]		(a)(1).

Section 816.72		
Intro	816.72 Intro, 816.73 Intro	(b).
(a)(1)	816.72(d), (f); 816.74(e)	(b)(2).
(a)(2)	816.71(d); 816.72(d); 816.73(c); 816.74(d)	(a)(6).
(b)	816.73(a), (b)	
(b)(1)	816.73(b)(1)	
(b)(2)	816.73(b)(2)	
(b)(3)	816.73(b)(3)	
Section 816.73		
Intro	816.74 Intro	(a)(10).
(a)	816.74 Intro	(a)(10)(i).
(b)	816.74 Intro, (a)(2)	(a)(10)(iii), (iv).
(c)	816.74 Intro	(a)(10)(ii).
(d)	816.74(b)(2)	
(e)	816.74	(a)(10).
(f)	816.74(d)	(a)(6).
Section 816.74		
(a)	816.75(a)	(d)(1).
(b)	816.75(b)	(d)(2).
(c)	816.75(c)	(d)(3).
(d)	816.75(d)	(d)(4).
(d)(1)	816.75(d)(1)	(d)(4)(1).
(d)(2)	816.75(d)(2)	(d)(4)(ii).
(e)	816.71(o), (o)(1)	(c), (c)(1).
(e)(1)	816.71(o)(2)(ii)	(c)(2)(ii).
(e)(2)	816.71(o)(2)(iv)	(c)(2)(iv).
(e)(3)	816.71(o)(2)(v)	(c)(2)(v).
(e)(4)		

In the final rule the majority of changes from the proposed rule are organizational and editorial. These changes will not be discussed in the preamble as the derivation table more effectively illustrates the movement and redesignation of provisions. However, any substantive changes from the proposed rules will be discussed.

It should be noted that in a number of instances provisions from proposed paragraphs have been split out and separately redesignated in the final rule.

SECTION 816.71 - GENERAL REQUIREMENTS.

The requirements in final Section 816.71 (a) through (j) discussed below provide general safety and environmental performance standards applicable to all excess spoil fills which the engineer responsible for designing and constructing the disposal area must satisfy and for which the operator will be responsible.

SECTION 816.71(a)

Final Section 816.71(a) requires that excess spoil be placed in designated disposal areas within the permit area in a controlled manner. This provision is slightly changed from the proposal but is revised only for clarity. Final Section 816.71(a) is consistent with Section 515(b)(22) (A) and (B) of the Act.

Final Section 816.71 (a)(1), (a)(2), and (a)(3) require that the excess spoil be placed in a controlled manner to minimize adverse effects on surface and ground water, ensure mass stability and prevent mass movement during and

after construction, and ensure that the disposal areas can be properly reclaimed.

One commenter asserted that OSM weakened the rule by requiring that the effect of leachate and runoff from the fill on surface and ground water be "minimized" in lieu of the previous requirement that allowed no degradation to occur. OSM disagrees. As a practical matter, it is impossible to absolutely prevent runoff or leachate from a fill. In such cases, the word minimize more accurately reflects the realities of excess spoil disposal. Additionally, Section 515(b)(10) of the Act requires that disturbances to the hydrologic balance be "minimized." The proposed rule is consistent with the language in Section 515(b)(10) of the Act and therefore, as final Section 816.71(a)(1), it is adopted as proposed with only a slight editorial change.

Final Section 816.71 (a)(2) and (a)(3) are consistent with Section 515(b)(22) (A) and (G) of the Act. No comments were received on these provisions and they are adopted as proposed.

SECTION 816.71(b)(1)

Final Section 816.71(b)(1) sets the certification standard for the design of fills and appurtenant structures, including foundations and gives the regulatory authorities the discretion to set additional design criteria. It follows Section 515(b)(22)H) of the Act. The first sentence of Section 816.71(b)(1) is adopted as the provision was proposed with only the change of the phrase "recognized professional standards" to "current, prudent engineering practices" for clarity and to make the OSM rules consistent with Mine Safety and Health Administration (MSHA) rules. See the comment under Section 816.71(f)(3) for further discussion.

One commenter objected to the discretionary authority given to the States to set additional design criteria while another commenter stated this was the only reasonable approach to adopt. In the proposed rules OSM eliminated many of the specific design criteria to allow greater flexibility and more innovative designs. It was intended that the regulatory authorities, along with the professional engineering community, would best be able to develop and set design criteria for their specific environments and locations. The regulatory authorities should have the leeway to set additional design criteria particularly if they are necessary to address regional or local problems. The argument of one commenter that the State would abuse its discretionary authority to the detriment of the industry is unsubstantiated. Sections 101, 503 and 505 of the Act clearly contemplate that the primary governmental responsibility for regulation of surface coal mining should rest with the States. Therefore, this provision has been adopted as proposed.

Documented Engineering Experience. A number of similar comments questioned the proposed provisions requiring the use of qualified registered professional engineers and the necessity for the engineers to furnish documentation in writing to the regulatory authority of their experience in the design and construction of earth and rock fills. One stated that the use of registered engineers would result in increased costs since all companies do not have registered engineers on their staffs. Further, it was asserted, many regulatory authorities also do not have registered engineers on their staffs. The commenter also felt that routine fill design does not necessarily require any elaborate engineering to ensure stability.

Other commenters objected to furnishing documented proof of design and construction engineering experience with earth and rock fills and presented the following arguments: (1) It was not consistent with reducing burdensome requirements; (2) The design should be judged on its merits, not the designer's experience; (3) The regulatory authority has no authority to regulate or evaluate engineers; and (4) State laws already prohibit engineers from signing off on designs beyond their level of competency.

Final Section 816.71(b)(1) continues to require the use of qualified registered professional engineers in the design of excess spoil fills as required by Section 515(b)(22)(H) of the Act. In Section 515(b)(22) of the Act, Congress expressed a clear concern that disposal of excess spoil be conducted in an environmentally sound and safe manner. It is fully consistent with the intent of the Act to require the involvement of a qualified registered professional engineer to help ensure the safety and environmental soundness of these structures. By the same token, the construction phase is as significant to the performance of an excess spoil facility as is the design. The level of accountability, therefore, should be similar to assure that the design has been properly implemented. The certification of the construction by a

qualified registered professional engineer required in final Section 816.71(h) is necessary to ensure the safety of the public and the protection of the environment.

It should be noted that under the excess spoil requirements of Section 515(b)(22)(H) of the Act, the term "qualified" is used with respect to registered professional engineers. This implies some further qualification beyond the normal professional engineering registration. OSM has found through its enforcement activities that some practicing registered professional engineers do not have sufficient experience to certify all phases of the design and construction of excess spoil disposal fills (Tipton, 1981). Therefore, with respect to excess spoil fills, the added requirement that the engineer only be a registered professional engineer but also be experienced in the design of excess spoil fills on similar structures is justified.

OSM agrees, however, that these qualifications need not be supported by extensive documentation with each certification. State regulatory authorities generally are familiar with the qualifications of those engineers who work regularly on mine design. If the regulatory authority is uncertain about the qualifications of an engineer or engineers, it may request additional proof of the engineer's experience.

Thus, under the final rule the regulatory authority will decide how permit applicants are to demonstrate that engineers are "qualified" and adequately experienced to handle the job. This could be done by oral interview with the engineer, checking references, a written document or by reputation.

As to whether the State regulatory authorities must have qualified engineers available on its staff, approval of a State program is conditioned upon the States having adequate staff to administer their programs. This is not to imply that OSM will require regulatory authorities to have registered professional engineers on their staffs. Although the Act requires the operator to use a qualified registered professional engineer, this requirement does not necessarily extend to the regulatory authority. Evaluations of the ability of the State program staffs to handle their responsibilities in permit review, inspections, and enforcements are made based upon individual State program submissions and can be made by OSM in its oversight role if deficiencies arise in a particular State. In addition, any submissions to OSM for approval of State program amendments removing design criteria will require the State to show how it will adequately review the design of the proposed mining operation.

SECTION 816.71(b)(2)

Final Section 816.71(b)(2) sets a static safety factor of 1.5 as the necessary degree of stability and requires the foundation and abutments of the fill to be stable under all conditions of construction. One commenter felt it was too conservative to require a safety factor of 1.5 in all cases for excess spoil fills and suggested the use of a lower factor of safety unless failure presented a particular hazard. OSM recognizes the limitations inherent in the use of static safety factors as design requirements. However, a change in the rule is not necessary, and OSM has decided to continue to include the 1.5 limitation in the final rule. Since the operator will have a certain level of design flexibility under the final rule and can generally select a suitable location for disposal of excess spoil, the factor of safety limitation of 1.5 is achievable and should not impose an undue burden on the operator.

It must be realized that this is a general requirement. The increased assurance of stability represented by achieving a factor of safety of 1.5 is necessary because excess spoil fills will be constructed on slopes or other locations where the foundation will generally not be as stable as backfilling on the level bench of the mined-out area.

Another commenter noted the 1.5 static safety factor applies only to the final configuration of the fill and does not assure stability during the construction. The final rule has been revised to state clearly that the fill must provide mass stability and prevent mass movement at all times, but at the same time be designed to achieve a minimum long-term static safety factor of 1.5. OSM recognizes that under some construction techniques, such as gravity placement, a factor of safety of 1.5 for material as it is being placed in the fill may not be achievable. However, the foundation and abutments must be stable at all times during construction.

The proposed rule also required that the foundation and abutments be stable under all conditions of operation. This requirement has been modified in final Section 816.71(b)(2) because the word "construction" better describes the use

and action associated with an excess spoil fill. It is more accurate to say a fill is "constructed" than to say it is "operated." No substantive change is intended by this revision.

SECTION 816.71(c)

Final Section 816.71(c) is a revised version of the proposed rule and requires disposal areas to be located on the most moderately sloping and naturally stable areas, as approved by the regulatory authority. The rule also requires the disposal area to be located, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

This provision was proposed to be applicable only for head-of-hollow and valley fills but has been moved to the section applicable to all excess spoil fills because Section 515(b)(22)(E) of the Act requires all excess spoil fills to be located using such slope considerations.

One commenter questioned the value of the proposed rule since it ignored the importance of environmental enhancement and compatibility with postmining land use in site selection of disposal areas.

The environmental enhancement and compatibility with the postmining land use are not ignored in the site selection of the disposal areas. Final Section 816.71(a)(3) requires that the excess spoil be placed in a designated disposal area so as to ensure that the final fill is suitable for reclamation and revegetation compatible with natural surroundings and the approved postmining land use. Final Section 816.71(e)(3) reinforces this by requiring the final configuration of the fill to be suitable for the approved postmining land use.

The intent of final Section 816.71(c) is to emphasize the importance of the location of the disposal area in regard to foundation slopes and their effect on stability. Final Paragraph (c) follows the requirements of Section 515(b)(22)(E) of the Act.

SECTION 816.71(d)

Final Section 816.71(d) requires sufficient foundation investigation and laboratory testing of foundation materials for stability of the fill and the use of special stability analyses where the toe area is on a downslope. Final Section 816.71(d) is the same as the corresponding proposed provisions, except that a cross reference to the analysis requirements of Section 780.35 of this chapter is included and the provisions are now applicable to all excess spoil fills.

SECTION 816.71(d)(1)

Specifically, final Section 816.71(d)(1) requires that sufficient foundation investigations, as well as any necessary laboratory testing of foundation materials, be performed for the determination of proper design requirements for a stable fill foundation.

One commenter objected to the use of the term "sufficient" in this provision indicating that "sufficient" is open to individual interpretation and subject to the desires of the regulatory authority which in some situations may have no bearing on the level of investigation needed for the specific situation. The commenter also felt the testing was redundant, ridiculous and a waste of money in situations where, through years of experience, it has become common knowledge that in certain situations the resulting slopes will have a safety factor considerably above that required. Another commenter suggested that the regulatory authority should be allowed to exempt the operator from foundation studies that are not necessary. The commenter noted that in many coal mining regions of the West (nonsteep slope mining) little to no foundation investigation is necessary to assure stability.

As provided in the final Section 816.71(b)(2), the foundation and abutments of any fill must be stable under all conditions of construction. This basic standard must be met under all conditions. Stability of a foundation or abutment can only be determined from an investigation or study on the types and extent of the materials upon which the excess spoil is to be placed. On certain sites, the foundation materials will control the degree of stability. There is

guidance provided in many geotechnical references, including the OSM's Engineering and Design Manual for Disposal of Excess Spoil on the types of investigation necessary, along with the types and numbers of samples, and tests for different types of foundation materials. The determination of whether the investigations are sufficient can only be made by the professional engineer and the regulatory authority on a site-specific basis as supported by information on the site conditions.

OSM disagrees with the comment that foundation investigations are unnecessary in some areas. Foundation investigations, including any necessary tests, are necessary for all excess spoil fills. However, the extent of the investigation that is necessary can vary. Investigations can range from geological information taken from maps and adjoining outcrops or excavations, to obtaining boring samples for testing, followed by design analysis of conditions. These are all engineering judgments that have to be made on a site-specific basis. Because of the congressional concern for stability, costs of foundation investigation are not considered wasteful. Based on site-specific conditions, the costs can vary over a wide range. One change has, however, been made for the final rule based on these comments. The words "any necessary" have been added before the phrase "laboratory testing" to recognize that laboratory testing may not be necessary in all cases.

Final Section 816.71(d)(1) does not adopt the requirement of the proposed rule that the regulatory authority must approve the design prior to construction. This requirement is implicit in the permitting requirements of Subchapter G. No substantive change is intended by this revision.

SECTION 816.71(d)(2)

Section 816.71(d)(2) requires keyway cuts or rock toe buttresses when the slope in the disposal area is in excess of 2.8h:lv (36 percent) or at a lesser degree set by the regulatory authority. The rule also requires stability analyses in accordance with Section 780.35(c) to determine the size of any necessary rock toe buttresses or keyway cuts whenever the toe of the spoil rests on a downslope. This provision is identical to previous Section 816.71(i) and has been retained in this rule without change.

One commenter remarked that keyway cuts or rock toe buttresses cannot necessarily be used interchangeably without discretion as indicated in the proposed rule. The commenter further remarked that the wording seemed to preclude the use of a combination of these design concepts, and appeared to be a specification item not a performance item.

The final rule is not intended to preclude a combination of both types of structure. Whether both keyway cuts and rock toe buttresses are required can best be determined by qualified engineers on a site-by-site basis.

One commenter objected to allowing the regulatory authority discretion to require rock toe buttresses and/or keyways on lesser slopes, while another commenter felt a specific slope ratio was not necessary since this could be determined by design analysis. The stability of the toe area, as well as the spoil pile, must meet the stability requirements of final Section 816.71(b)(2) regardless of the slope at the toe area or elsewhere. The 2.8h:lv slope (36 percent) was retained from the previous rule as being consistent with the greater concern for stability on steep slopes. Specifying such slopes does not, however, preclude the potential need for use of such structures on lesser slopes. The final rule recognizes this and provides the regulatory authority the flexibility to extend the requirement to such lesser slopes.

SECTION 816.71(e)(1)

Final Section 816.71(e)(1) requires removal of vegetation and organic matter and implements requirements for handling of topsoil. The final rule is adopted as proposed, but with a correction to reference only Section 816.22 which now consolidates all the topsoil rules.

Several commenters contended that removal of all topsoil, vegetative and organic material from the entire disposal area was not necessary for stability especially in steep slope areas where the material is scarce and the cost of removing it prohibitive.

Removal of topsoil and organic material is generally consistent with good engineering practices. The requirement of final Section 816.71(e)(1) comes directly from Section 515(b)(5) and 515(b)(22)(B) of the Act. The necessity and extent of topsoil removal is set forth in final Section 816.22. Further guidance on topsoil removal is provided in the preamble to that section.

SECTION 816.71(e)(2)

Final Section 816.71(e)(2) establishes the basic fill construction standards. It requires that excess spoil be placed in 4-foot lifts, be compacted for stability, be graded for compatibility with surrounding terrain, and be covered with topsoil or equivalent substitute material. The paragraph also allows lifts other than 4 feet in thickness if approved by the regulatory authority.

One commenter asserted that the change of wording in the first sentence of the proposed provision from "hauled and conveyed" to "transported" to the designated disposal area will reinstitute the practice of "end dumping spoil material into fill areas," particularly in steep-sloped mining areas of Southern Appalachia. The commenter further asserted that Congress intended that this practice be discontinued.

OSM made the revision to be consistent with the wording in the Act. The Act uses the phrase "transported and placed in a controlled manner." The first sentence of final Section 816.71(e)(2), closely parallels Section 515(b)(22)(A) of the Act. The requirements of final Section 816.71(e)(2), along with other requirements of the section, are adequate to prevent the uncontrolled end-dumping practices of the past. However, OSM has clarified the first sentence of Section 816.71(e)(2), editing it to read "* * * shall be transported and placed in a controlled manner in horizontal lifts * * *" to eliminate any possible confusion. On the other hand, gravity placement of fill is not prohibited under the Act. See Section 816.71 of the previous rules *(46 FR 37231)*. The commenter is correct, however, in indicating that Congress did intend to eliminate the "uncontrolled" end dumping of material. The final rule does prohibit the uncontrolled end dumping of excess spoil.

One commenter asserted that in the previous rules the 4-foot maximum lift requirement only applied to valley fills and that this requirement in the proposed rule should have been included in the special provisions for head-of-hollow/valley fills.

The necessity of having a 4-foot-lift thickness is more related to manner of placement and the type of materials involved than the type or location of the fill. The 4-foot-lift requirement has been found to be a generally accepted depth for proper compaction by equipment normally available on surface mining operations. The 4-foot-lift requirement is also consistent with the goal to minimize disturbance of the hydrologic balance by allowing concurrent reclamation, and to limit settlement to reasonable ranges so as not to alter final drainage features. Therefore, the 4-foot maximum lift standard has been retained as a general requirement in the final rule. However, the 4-foot limit for all fills should not result in undue hardship. An alternate design may be approved by the regulatory authority if it is demonstrated by the operator and certified by a qualified registered professional engineer that the use of lifts in excess of 4 feet will ensure the stability of the fill and will meet all other applicable requirements.

One commenter was in favor of the provision giving the regulatory authority discretion to allow lifts greater than 4 feet. Several other commenters were against this provision. One of the commenters asserted that the discretion to allow lifts greater than 4 feet would lead to serious abuse, circumventing Congress' intent that spoil be compacted, and thereby resulting in adverse impacts to the environment.

Discretion should be given to the regulatory authority because the State is in a much better position to decide whether the economy of allowing thicker lifts is properly balanced by environmental and public safety precautions. In addition, the phrase "horizontal lifts other than 4 feet in thickness" allows the regulatory authority to require lifts of less than 4 feet if site-specific conditions require. Obviously, to use thicker lifts the responsible engineer will have to make special adjustments for stability of the fill. These adjustments can take the form of increased compaction for improvement of strength; control of the type of material used in certain portions of the fill, such as specifying only

certain types of rock; or other measures consistent with the properties of the excess spoil and the site-specific conditions of the disposal area. The depth of the lift must be consistent with the compaction effort required.

OSM recognizes that compaction may vary depending upon the particular design used, the properties of the excess spoil and the characteristics of the site and the approved postmining land use. These items can be properly evaluated by qualified engineers and appropriate regulatory authorities. Because operators are required to use qualified engineers for design and construction of excess spoil facilities, the operator must use the construction techniques that will be consistent with the engineer's design determinations and specified construction control measures.

Such measures must ensure controlled placement and concurrent compaction as necessary to ensure mass stability and prevent mass movement during and after construction. Such techniques must also minimize adverse effects on downstream water quality both during and after construction. Proposed departures from the 4-foot lift requirement must be evaluated by the regulatory authority and, where consistent with engineering and environmental performance standards, the regulatory authority could approve the use of lifts in excess of the 4-foot maximum. The final rule is consistent with congressional intent and there is no basis to believe that the flexibility provided will lead to abuse. For these reasons the final rule incorporates the provisions substantially as proposed.

SECTION 816.71(e)(3)

Final Section 816.71(e)(3) outlines when terraces can be used and sets the grade of the outslope between terrace benches. One commenter felt that provisions should be made for site-specific exceptions to the maximum slope of 2h:lv allowed in final Section 816.71(e)(3). The commenter pointed out that steeper slopes than 2:1 have been used for highway embankments and commercial areas.

OSM recognizes that fill outslopes steeper than 2h:1v have been constructed on highway embankments and residential areas. However, in most cases, these are because of some special constraint, such as right-of-way limitations or utility relocations. Additionally, some maintenance is usually assured for these facilities.

Geotechnical engineers and revegetation experts consistently limit slopes to the flattest slope feasible. The maximum 2:1 slope is usually the standard, not only because of revegetation and stability but also because of added costs and equipment limitations. Adjustments can be made on most operations to accommodate additional excess spoil without resorting to steeper outslopes. Also, the 2:1 maximum is more consistent with all environmental performance standards than a steeper slope. If an operator wishes to demonstrate the feasibility of using steeper slopes on excess spoil facilities, the provisions for experimental practices could possibly be used if the requirements of 30 CFR 785.13 are met.

The design requirements of the previous rule to grade the terrace bench to slope toward the fill and diversion ditches and to build a ditch at the intersection of the outslope and the bench to control runoff are deleted from final Section 816.71(e)(3) because final Section 816.71(a) contains performance standards to minimize the adverse effects of surface runoff and Section 816.71(f) contains drainage provisions.

The conditions for allowing terraces have been expanded to include conservation of soil moisture and any construction necessary to facilitate the approved postmining land use rather than just to develop primary roads. OSM recognizes the diverse uses for terraces in reclamation of a coal mining site and has expanded Section 816.71(e)(3) appropriately. Terraces are a standard soil conservation convention to control runoff flow of water and reduce the soil loss caused by erosion and therefore are of positive value when constructed to be consistent with the approved postmining land use.

SECTION 816.71(e)(4)

Final Section 816.71(e)(4) prohibits impoundments on completed fills, but allows small depressions if needed to retain moisture, minimize erosion, create wildlife habitat or assist revegetation and if they are not incompatible with the stability of the fill. Final Section 816.71(e)(4) differs from the proposed and previous rules in that it allows small depressions on completed fills where before they were prohibited.

One commenter suggested that this provision should allow use of depressions or impoundments where they are compatible with the postmining land use and are incorporated in the design of the fill.

Under the general requirements of Section 816.71 the regulatory authority may allow small depressions for certain fills if they are necessary and will create beneficial results. However, the small depressions must not be incompatible with the stability of the fill, as discussed in the preamble to the previous rules *(44 FR 15203-15204)*.

There are many types of fills, such as area or side-hill fills, on which a small depression may be a suitable feature, but it would be incumbent upon the regulatory authority to thoroughly review all proposed plans that include small depressions as a feature. This is especially important for head-of-hollow fills where the regulatory authority must ensure that the small depressions will not create a phreatic surface within the fill that may affect the long-term stability of the fill.

Small depressions are typically described as gouges or furrows in the earth and other similar small, infrequent and shallow depressions left by mining or agricultural machinery. These depressions will have to be revegetated, though such vegetation may be more lush than the surrounding area due to the increased moisture collection. Congress intended that depressions that collect and store water be barred unless approved as permanent impoundments. Sen. Rep. 95-128, 95th Cong., 1st Sess., at p. 99 (1977). Therefore, the small depressions must not collect and store water.

Impoundments are not allowed in excess spoil fills. They require more critical performance standards, design and construction methods. They cannot be included as a makeshift feature of an excess spoil fill. Impoundments are properly regulated under 30 CFR 816.49 and 817.49 -- Impoundments, and proposed Sections 816.84 and 817.84 -- Coal mine waste impoundments.

SECTION 816.71(e)(5)

Final Section 816.71(e)(5) provides requirements for disposal of acid- or toxic-forming excess spoil materials. This section has been added to the final rules in response to a commenter who asked whether excess spoil that was acid- or toxic-forming would be allowed in an excess spoil fill. Final Section 816.71(e)(5) sets the conditions for the disposal in an excess spoil fill of acid- or toxic-forming or combustible excess spoil material produced from coal mining. The acid- or toxic-forming overburden material must be adequately covered with nonacid, nontoxic and noncombustible excess spoil material, or treated, to control the impact on surface and ground water in accordance with Section 816.41, to prevent combustion, and to minimize adverse effects on plants and land uses. This rule follows Section 515(b)(14) of the Act. Further explanation for this rule and the comment that initiated it is found in this preamble discussion concerning the disposal of coal mine waste under Section 816.71(i).

SECTION 816.71(f)(1)

Final Section 816.71(f)(1) requires that water, depending on its source, be diverted around excess spoil fills or handled in underdrain systems. The provision follows Section 515(b)(22)(C) and (D) of the Act. The final rule has been modified from the proposal to state what performance standards must be met if the fill area contains water rather than to specify a design to divert the water. The performance standards are to control erosion, prevent water from infiltrating the fill and ensure stability of the fill. The proposed requirement for approval of the drainage plan by the regulatory authority is redundant and unnecessary since the fill design must be approved as part of the reclamation plan submitted under Part 780 of this chapter.

One commenter suggested that the word "prevent" in final Section 816.71(f)(1) be revised to read "minimize" since it would be very costly to build an underdrain that would absolutely prevent water infiltration into the fill.

The basic purpose of the underdrain system is to provide a conduit for transportation of ground water from existing springs or seeps beneath the excess spoil fill and from any water seepage into the fill due to rainfall to prevent excessive hydrostatic head from developing within the fill. Excessive hydrostatic head could lead to mass movement

and failure of the fill. OSM agrees that it is impractical to absolutely prevent water infiltration into a fill. Rather the underdrains should be capable of carrying away water that does infiltrate into the fill and prevent the build up of a phreatic surface within the fill. Either the words "prevent" or "minimize" would accomplish this objective. The final rule continues to use the term "prevent" as more consistent with the express language of Sections 515(b)(22) (C) and (D) of the Act. In this context it is meant to prevent infiltration that would result in the build up of a phreatic surface within the fill.

SECTION 816.71(f)(2)

Final Section 816.71(f)(2) requires that diversions comply with the performance standards for diversions in Section 816.43. No comments were received on this provision and it is adopted with some editorial revisions.

SECTION 816.71(f)(3)

Final Section 816.71(f)(3) contains the specific requirements for underdrain systems. This provision was moved to Section 816.71 because these specific requirements apply to all underdrain systems whether or not the disposal area falls within the definition of a head-of-hollow or valley fill. The requirements are consistent with Section 515(b)(22)(D) of the Act.

One commenter felt the proposed provision could be erroneously read to require only the filter to meet specific standards, instead of the entire underdrain system. OSM recognizes the confusion and has amended final Section 816.71(f)(3) to clear up this inconsistency.

One commenter stated an underdrain system does not have to be provided in the non-structural portion of the fill and recommended the requirements of final Section 816.71(f)(3) not apply where the presence of an underdrain has no effect on the performance of the structure. The Act requires that underdrains be constructed in such a manner that infiltration of water from springs, natural water courses, or wet weather seeps into the excess spoil fill will be prevented. In addition, the performance standard of minimizing disturbances to the hydrologic balance with respect to the quality and quantity of ground water systems must be met. These are all design considerations that have to be determined on a site-by-site basis by a qualified engineer who has knowledge of the effects of water infiltration on the performance of the fill and ground water quality and quantity. In most cases all the springs and wet weather seeps of any significance will be tied into the main underdrain system, whether in the structural zone or not. By allowing the use of an underdrain pipe system, this is now feasible in all other methods of placement and can be achieved with little additional control and effort in disposal areas where the dumped, durable rock fill allowed in Section 816.73 is used.

An editorial change was made in final Section 816.71(f)(3) to clarify that the underdrain system is to be designed to carry the "anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area" rather than to carry the "anticipated flow of infiltration into the fill."

One commenter asserted that the phrase "accepted engineering practices" is more appropriate than "standard geotechnical engineering method" as used in the proposed provision since there are no standard methods of practice established. OSM agrees that the suggested phrase is more consistent with actual practice. But in order to make the rules more consistent with MSHA rules, OSM has chosen to use MSHA phrasing -- "current, prudent engineering practices." This phrase, taken from 30 CFR 77.215(i), is interpreted to mean practices well-established by engineering principles and widely recognized by experts for use in excess spoil disposal, as opposed to practices being novel or experimental. The engineer is also responsible for confirming that the practice has long-term reliability. Final Section 816.71(f)(3) is revised accordingly.

One commenter noted that many shales have been found acceptable for use in highway underdrain systems and recommended that final Section 816.71(f)(3) be revised to allow the use of shale in rock underdrains.

Nowhere does the final rule specifically prohibit the use of shale in a rock underdrain. However, very specific performance standards have been set in Section 816.71(f)(3) and elsewhere in the rules for rocks that are to be used in underdrains. If the type of shale the commenter is considering can be certified to meet the performance standards,

then conceivably the shale could be used in the underdrain. But shale materials are difficult to evaluate with respect to long-term physical characteristics and are extremely variable in durability, tendency to slake in water and degrade to soil material. In order to compensate for the lack of any assigned maintenance responsibility for excess spoil fills, long-term functioning requirements for rock underdrains are warranted and the use of the highest quality of materials for underdrain systems is required. Shale, unfortunately, is not high on the list when it comes to durability and long-term stability. The final rule does allow pipe to be used as an alternative underdrain conduit, which could be used where high quality rock materials are not readily available.

One commenter stated that the use of pipe as allowed in lieu of durable rock may pose long-term stability problems given the design "life" limitations of metal pipes. Additionally, the use of pipe will require an intense scrutiny of the rate of corrosion, inherent strength and other related hazards. OSM agrees that pipe cannot be used indiscriminately and that careful analysis must be given to the environmental as well as structural considerations. It is standard engineering knowledge that certain types of pipes have a very limited design life. Therefore, OSM has inserted performance standards for perforated pipe underdrains. Final Section 816.71(f)(3) requires these underdrain pipes to be corrosion resistant and to have characteristics consistent with the long-term life of the fill. The qualified engineer must certify that the design will meet the long-term performance standards, and with this additional provision the engineer will have to specify the type of pipe to be used such that it will meet the long-term performance requirements.

Another commenter stated it was "technically satisfying" to be able to use site-specific designs for underdrains, but that it does impose the burden of specific hydraulic sizing design analysis upon each excess spoil fill component.

The hydraulic sizing should be analyzed for each part of the fill regardless of whether the engineer is using set design standards or performance standards. Engineers using a design standard set by OSM or the regulatory authority should analyze it with regard to whether it is appropriate for their conditions and adequate to ensure the public and environmental safety. While a design standard set by OSM or the regulatory authority is the minimum design required, a more protective design may be necessary on that particular site.

SECTION 816.71(g)

Final Section 816.71(g) requires that slope protection be provided to minimize surface erosion and that all disturbed areas be revegetated. The provisions in final Section 816.71(g) received no comments and they are adopted as proposed with editorial revisions. Final Section 816.71(g) is consistent with Section 515(b) (4) and (19) of the Act.

SECTION 816.71(h)

Final Section 816.71(h)(1-4) outlines the basic construction quality control standards. Final Section 816.71(h) requires a qualified registered professional engineer or other qualified professional specialist to inspect the fill periodically during construction and the engineer to certify that the fill has been constructed as designed and that it is stable. The comments regarding the determination of whether an engineer is a qualified registered professional engineer in Section 816.71(h) were discussed with other comments received on Section 816.71(b)(1). As a result of those comments the proposed requirement to document experience in writing is removed from final Section 816.71(h). The reader is referred to Section 816.71(b)(1) for the discussion of those comments.

One commenter recommended that the phrase "under the supervision of the registered engineer" be added after the term "specialist" in final Section 816.71(h). Otherwise, the commenter said, the requirement puts the engineer in the position of making a certification based on inspections done by a person on whom the engineer may not be able to rely. The commenter further asserted that the engineer must be able to dictate when to make an inspection and to instruct the specialist on what should be observed. This suggestion has been accepted. The specialist should supply sufficient documentation for the engineer to make a certification with respect to the constructed fill. The revised language will ensure that necessary inspections and observations are conducted if a specialist is used. The terms "qualified" and "professional" require that the specialist be reliable and have the necessary background and experience to conduct the necessary inspections. In any case, it is the engineer who must certify the fill and it is the engineer who has the choice of using the services of a "specialist" to aid in the inspection activities.

SECTION 816.71(h)(1)

Final Section 816.71(h)(1) calls for inspections to be made at least quarterly throughout construction, during critical construction periods and regularly during placement and compaction of fill materials.

It should be noted that these inspections do not satisfy the requirements for enforcement inspections to be done by the regulatory authority and do not serve the same purpose. The basic objective of inspections by the certifying engineer is to ensure that the construction is being performed in accordance with design, requirements. The frequency of inspection will vary from site to site based upon types of material, the design rate of placement, operational personnel, and other factors. These items must be considered both by the regulatory authority and the inspecting engineer.

One commenter asserted that quarterly inspections may not be frequent enough. The quarterly inspection requirement is a minimum requirement and it is anticipated that most engineers would want to exceed this frequency in order to support their certification statements. The quarterly inspection frequency was maintained as a minimum standard in final Section 816.71(h)(1).

One commenter requested clarification of the "critical construction periods" mentioned in final Section 816.71(h)(1) since the commenter felt the rule implied that daily inspection for placement and compaction would be needed to certify each load as well as to certify each phase of revegetation. Another commenter felt some of the items were too routine to require reporting.

The five phases outlined in the proposed rule were listed in the previous rules in response to a similar comment [*44 FR 15204,* March 13, 1979]. These were listed to show the normally critical periods on most fills in addition to providing a guide for the frequency of inspection. The regulatory authority has the discretion to be more specific and set additional inspection criteria. Since the engineer must certify the construction, he must determine based on site-specific conditions how often his inspections are needed and how detailed the reports need to be to support his certification. For instance, during certain fill operations such as placement of underdrain systems daily inspections may be required. During other aspects of the operation, less frequent inspections may be necessary. The final rule has been revised to reflect this flexibility and to allow the regulatory authority and the inspecting engineer to establish additional critical construction periods requiring inspections. The final rule continues to require, however, that such critical construction periods include foundation preparation with the removal of organic material and topsoil; placement of underdrains and protective filter systems; installation of final surface drainage systems; and the final graded and revegetated fill. Routine placement of fill has been eliminated from the final rule as a mandatory critical construction period, since such operations are not always critical. If, however, placement and compaction aspects of construction are critical to a particular design, it is expected that the qualified engineer or specialist will inspect the fill during such critical periods.

SECTION 816.71(h)(2)

Final Section 816.71(h)(2) requires the qualified registered professional engineer to provide the regulatory authority with reports certifying that the fill has been constructed and maintained as designed and in accordance with the approved plan and 30 CFR Chapter VII. Such reports, which have to be filed promptly after each inspection, must describe any apparent instability, structural weakness, and other hazardous conditions.

One commenter remarked that the reporting requirements of final Section 816.71(h)(2) placed undue constraint on a coal operation which has many small fills progressing simultaneously. The commenter suggested rather than a report on each fill, that an engineer could submit one consolidated report on all the small fills. The final rule is not intended to prevent the certifying engineer from inspecting more than one fill on the same inspection; conducting a series of inspections; or, depending on the requirements of the specific regulatory authority, covering several fills in one report. No change is deemed necessary in the final rule. The engineer and the regulatory authority have the discretion to accommodate the construction of several small fills at the same time.

SECTION 816.71(h)(3)

Final Section 816.71(h)(3) requires that the certified report also include color photographs of the underdrain and sets the specific conditions for those photos. A paragraph is added to clarify the photographic documentation necessary for a natural segregation drainage system.

Two commenters stated that the color photograph requirements for underdrain systems preclude the construction of an underdrain system by the natural segregation technique employed under the durable rock fills methods of disposal. OSM recognizes the natural segregation method of constructing the underdrain system under the durable rock spoil disposal method. However, photographic documentation is still appropriate. OSM has added a sentence to final Section 816.71(h)(3) requiring color photographs be taken of the underdrain as it is being formed when, in building a durable rock fill, natural segregation of rock is used to create the underdrain.

Photographs taken during normal routine inspections by the engineer will be sufficient in most cases. In cases where extension of materials to the area is not achieved in the dumping operation a separate operation to create a drainage system may still be necessary. In these instances, photographic documentation of any necessary extension of the system by a separate operation should also be made prior to the grading operation to achieve the final configuration.

One commenter did not believe the requirement for photographs was excessively burdensome given the importance of drain and filter systems to the integrity of the excess spoil structure. Another commenter said the photographs are helpful but will not ensure the drainage system will function properly. The commenter said the only assured method of determining adequacy of the drain and filter system was to conduct periodic gradation analyses of the materials used and other standard testing processes.

OSM agrees. The photographs of the underdrains are meant to be a record for proper certification by the engineer that the underdrain has been designed and constructed as planned. The photographs are not intended to be the sole basis for the engineer's certification of the proper construction of the underdrain.

There are many events that can occur during the construction of an excess spoil fill that can affect the quality or integrity of the underdrain system, such as a large rainfall event that washes sediments from the unreclaimed soil slopes into the drain voids or equipment operators inadvertently destroying the constructed filters. The frequent and certified inspections by the engineer during the entire construction of the fill should identify such unforeseen adverse impacts and the remedial action needed. For all non-durable rock fills, a separate construction operation and certification is necessary for the underdrain system. Even where natural segregation is employed for constructing the underdrain system, special design and construction consideration of the underdrain system must be given by the responsible engineer to support his certification. Therefore, the proposed rule is adopted as final with the addition of the clarification for durable rock fills discussed earlier.

SECTION 816.71(h)(4)

Final Section 816.71(h)(4) requires a copy of each inspection report to be retained at or near the mine site.

One commenter recommended that the requirement that reports be kept "at the mine site" be changed to read "at or near the mine site." It was anticipated by the proposed rules that the reports would be retained at the same location where other mine records, such as, licenses, approved plans, current permits and authorization to operate, were kept. OSM has previously ruled that mine records should be available at or near the mine site. Final Section 816.71(h)(4) has been revised to read "at or near the mine site."

SECTION 816.71(i)

Final Section 816.71(i)(1-3) allows for the disposal of coal mine waste in excess spoil fills and sets the performance standards for such operations. These requirements are consistent with those in Section 515(b)(11) of the Act. In order to put coal mine waste in an excess spoil fill the final rule requires that it be placed according to the coal mine

waste rules in proposed Section 816.83, that the coal mine waste be nontoxic- and nonacid-forming and that it be of the proper characteristics to be consistent with design stability of the fill. For convenience, these rules reference the draft final coal mine waste rules as set forth in OSM's "Final Environmental Impact Statement OSM EIS-1: Supplement," (FEIS) Volume III, p. 193. If such rules are not adopted, a technical amendment will be issued to provide the proper reference. This also applies to references to other proposed rules which appear in this final rule (for instance, the references to proposed Sections 816.41 and 816.43 in final Sections 816.71(e)(5) and 816.72(a)(2), respectively).

Several commenters felt the proposed rule represented a change in policy in that it allowed the disposal of coal mine waste in head-of-hollow and valley fills and that this change increases the probability of failure in fills because it will be more difficult to achieve long-term stability. They also indicated the proposed elimination of the 90-percent dry density requirements from the coal mine waste rules (See previous Section 816.85(c)(2)) which are referenced by final Section 816.71(i)(1) increases the likelihood of coal mine waste fires developing in these fills. They cited other adverse impacts such as increased sedimentation, destruction of aquatic life, and increased hazard to human health and safety from failure of fills.

The physical, chemical and engineering properties of coal mine waste can be adequately defined by proper testing techniques. This makes it feasible to analyze, design and apply properly the necessary construction controls to place coal mine waste in excess spoil fills so as to meet all performance standards of the Act and rules including the minimum long-term static safety factor of 1.5.

The adopted rules require the operator to use qualified registered professional engineers for analysis and design and that the construction be certified by a qualified registered professional engineer. In addition the rules require site-by-site approval by the regulatory authority, and further that the coal mine waste materials be placed in accordance with standard coal mine waste disposal methods as outlined in proposed Section 816.83.

In steep slope areas, where head-of-hollow and valley fill excess spoil facilities are normally constructed, coal mine waste has in the past been disposed of in the same or similar fill configurations. By allowing the combination of such materials in fills under proper design and construction techniques, this rule should reduce unnecessary duplication of fills and reduce the number of valley fills while maintaining environmental and safety standards. Coal mine waste can be disposed of in such facilities without any increase in adverse impacts. The provision is adopted as proposed with minor editorial revisions.

One commenter thought that the requirement of final Section 816.71(i)(2) prohibited the disposal of toxic- and acid-forming overburden materials in excess spoil fills.

The proposed provision corresponding to Section 816.71(i)(2) referred only to coal mine waste, not acid- or toxic-forming overburden. Most overburden materials will be returned to the mined-out area and backfilled and graded according to Section 816.102. In the rare case where there is an excess of acidic or toxic overburden material it shall be disposed of in a permitted excess spoil disposal area using similar compaction and cover requirements as those required in Section 816.102(e). A provision similar to Section 816.102(e) has been inserted in the final rule as Section 816.71(e)(5) to cover such instances. Coal mine waste must be nontoxic- and nonacid-forming if it is to be placed in an excess spoil fill.

The backfilling and grading rules in final Section 816.102(e) and the excess spoil rule Section 816.71(e)(5) require that all acid- or toxic-forming overburden materials be adequately covered with nonacid- and nontoxic-forming material. This acidic or toxic material must also be treated if necessary to control any adverse impact to surface and ground water in accordance with proposed Section 816.41, to prevent combustion, and to minimize adverse effects on plant growth and land uses.

Additionally, coal mine waste disposed of in an excess spoil fill must be handled according to proposed Section 816.83, which requires that all coal mine waste be covered by 4 feet of nonacid and nontoxic overburden material

Therefore, when coal mine waste is used in an excess spoil fill only excess overburden material that is nonacid- and

nontoxic-forming may cover the coal mine waste.

SECTION 816.71(j)

Final Section 816.71(j) provides provisions for returning excess spoil to underground mine workings. All underground activities require approval and/or coordination with MSHA. No specific comments were received, and the provision is adopted as proposed. This provision follows Sections 516(a) and 515(b)(11) of the Act.

SECTION 816.72 - DISPOSAL OF EXCESS SPOIL: VALLEY FILLS/HEAD-OF-HOLLOW FILLS.

Final Section 816.72 outlines the special requirements that must be met in addition to the general requirements of Section 816.71 when the excess spoil disposal area falls within the definition of a head-of-hollow or valley fill.

SECTION 816.72(a)

Final Section 816.72(a)(1-2) covers control of surface runoff and runoff from above the fill and sets the performance standards for diversion channels. Final Section 816.72(a)(1) requires the top surface of the fill to be graded to slope toward properly designed drainage channels and prohibits directing uncontrolled surface drainage over the outslope. This is necessary to prevent erosion of the outslope of the fill. No comments were received on this provision and it is adopted as proposed.

Final Section 816.72(a)(2) requires that runoff from areas above the fill and the surface of the fill be diverted into stabilized diversion channels designed according to proposed Section 816.43 and which are also able to safely pass the runoff from a 100-year, 6-hour precipitation event. The final rule is slightly revised from the proposed rule.

The proposed rule would have required that the 100-year, 6-hour design storm event be used in the design of drainage systems for all head-of-hollow and valley fills and in all other fills if required by the regulatory authority to ensure stability.

One commenter said the use of the design storm criteria in all head-of-hollow and valley fills was unnecessary. The commenter wanted the regulatory authority to have the discretion to decide if the design storm criteria were needed to ensure stability.

The design storm criteria are included in the final rule because at this time they are considered critical to the protection of the environment and the public safety. In the final rule, the 100-year, 6-hour design storm criteria are contained in Section 816.72(a)(2) as special requirements for head-of-hollow and valley fills. Their use will not be required for other types of fills, where lower design storm criteria are used because of the less critical nature of the fill.

Several commenters stated that the change of the design precipitation event to the 100-year, 6-hour storm weakens the channel capacity requirements and may increase the potential for erosion, but gave no reasons or data to support their conclusions.

The storm design criteria were changed to be consistent with the storm design criteria of the Mine Safety and Health Administration (MSHA) published in "Design Guidelines for Coal Refuse Piles and Water, Sediment, or Slurry Impoundments and Impounding Structures" (IR1109). OSM recognizes that the 24-hour duration storm usually results in a runoff volume and peak somewhat higher than the 6-hour storm for the same area (See *44 FR 15207.)* However, it also has been reported that in some watersheds, the 100-year, 6-hour event can result in a higher peak flow. For a given storm frequency, the time of concentration and watershed shape can be more influential in determining the peak flow than the storm duration. In most cases the differences in any increased volume of peak flows will be minor from a practical design and construction standpoint. Any computed increase in peak flow volume would most likely not result in any significant change in flow depth or flow velocities, and correspondingly, any alteration in channel design. For instance, in a rock riprap-lined channel, velocity increase from resulting increase in peaks would not likely alter the specified rock size used in the design. Therefore, the change in precipitation event for

design of diversions on excess spoil fills will not result in any significant increase in the potential for erosion.

SECTION 816.72(b) Rock-core chimney drains.

In the proposed rulemaking of June 8, 1982 *(47 FR 24961)*, OSM inadvertently proposed to remove the provisions for rock-core chimney drains in head-of-hollow and valley fills that were previously contained in Section 816.73 (a) and (b). To correct that omission, final Section 816.72(b) sets the conditions when rock-core chimney drains may be used and additional Paragraphs (b)(1), (b)(2), and (b)(3) contain the performance and design requirements. No comments were received on this omission or in relation to rock-core chimney drains.

Final Section 816.72(b) allows rock-core chimney drains to be used for head-of-hollow fills that are not located in areas having intermittent or perennial streams. A rock-core chimney drain may be used in a valley fill if the fill does not exceed 250,000 cubic yards of material and upstream drainage is diverted around the fill. Those fills in a head-of-hollow that do not reach the ridgeline are considered valley fills. The previous rules allowed-rock core chimney drains in such fills if they did not exceed 250,000 cubic yards.

OSM also recognizes the need to prevent a phreatic surface from developing within critical zones of the fill and the continued need for chimney drains to prevent this from occurring not only from underground flows, but also from infiltration of rain water.

SECTION 816.72(b)(1)

Final Section 816.72(b)(1) is taken directly from previous Section 816.73(b)(1) with an additional phrase added. It requires a vertical core of durable rock at least 16 feet thick extending from the toe to the head of the fill and from the base to the surface of the fill. A system of lateral rock underdrains connected to the rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs. It also requires the rocks used in the drain to meet the requirements of Section 816.71(f), which defines the characteristics of durable rock.

SECTION 816.72(b)(2)

Final Section 816.72(b)(2) requires a filter system, to ensure the proper functioning of the rock core, to be designed and constructed using current, prudent engineering practices. This provision is derived from previous Section 816.73(b)(2) with a change from the phrase "standard geotechnical engineering methods" to "current, prudent engineering practices" because, as discussed previously, the new phrase is more consistent with actual practice and MSHA rules. (See discussion under Section 816.71(f)(3)).

SECTION 816.72(b)(3)

Final Section 816.72(b)(3) allows grading to drain surface water toward the rock core, but prohibits intermittent or perennial streams from being diverted into the rock core. It requires that the maximum slope of the top of the fill be 33h:lv (3 percent). Terraces on the fill shall be graded with 3 to 5 percent grade toward the fill and a 1 percent slope toward the rock core. The final rule also allows for a drainage pocket to intercept runoff over the rock drain if it does not impair the stability of the fill and does not have the potential capacity for impounding more than 10,000 cubic feet of water. Final Section 816.72(b)(3) comes directly from previous Section 816.73(b)(3).

Because the final rule on rock-core chimney drains was only slightly changed from the previous rule the justification for its inclusion remains the same as that which was contained in the previous rulemaking on March 13, 1979. (See *44 FR 14931 and 15206 and 15207).*

SECTION 816.73 - DURABLE ROCK FILLS.

Final Section 816.73 will allow the regulatory authority to approve the alternative method of disposing of excess durable rock spoil by gravity placement in single or multiple lifts and sets the performance and material standards for rock fills.

SECTION 816.73(a)

Final Section 816.73(a) requires that durable rock fills meet the requirements of Section 816.71, except as provided in Section 816.73. No comments were received on the proposal that such fills meet the "other environmental standards in Section 816.71," which is how it was proposed in the June 8, 1982, rulemaking. This final paragraph reflects the new organization of the rule without changing the substance of the requirement.

SECTION 816.73(b)

Final Section 816.73(b) retains from the previous and proposed rules the 80/20 ratio of durable to nondurable rock materials allowed in the fill and further describes the type of rock that may be used. A new phrase has been added to clarify an aspect of the proposed rule the commenters found confusing -- the requirement for the use of "nondegradable" rock.

One commenter felt the term implied the need for more testing and classification than was intended in the original rock fill concept. Another commenter noted that OSM had not offered any specifications as to how rock is determined to be durable and nondegradable by OSM standards. One commenter pointed out that there are no rocks native to his State that could be considered nondegradable.

OSM agrees that the proposed term was confusing. The intent in using the terms "durable and nondegradable" in the proposal was that not only does the rock in the fill need to be resistant to slaking, but it must also be resistant to breakdown to soil materials caused by handling, weathering, or chemical reaction. The rock must remain rock. However, because of the confusion, OSM has removed the term "nondegradable" and revised the proposed phrase to the final phrase "durable rock, that will not slake in water or degrade to soil materials." Soil materials are, in relation to durable rock fills, any materials that have degraded or will degrade to such a size as to block or cause failure of the underdrain system. The phrase "nonacid- and nontoxic-forming" was added in Section 816.73(b) to describe the type of rock that can be used in a durable rock fill. Just as in the rule for rock underdrains in final Section 816.71(f), the rocks used in a durable rock fill must be nonacid- and nontoxic-forming. This is because, in most cases, the fill is in itself a rock underdrain formed through natural segregation of dumped rock materials. With one exception, all acid- and toxic-forming materials, whether soil or rock, must be returned to the pit area and backfilled and graded according to Section 816.102(e). Only in rare instances would there be an excess of such material needed to be disposed of in an excess spoil fill and this may only be done according to final Section 816.71(e)(5).

SECTION 816.73(c)

Final Section 816.73(c) retains from the proposed rule the requirement that a qualified registered professional engineer must certify that the design will ensure the stability of the fill and meet all other applicable rules.

The proposed requirement that the operator "demonstrate" that the fill meets the design, stability or other performance standards has not been adopted. Since the 1.5 and 1.1 safety factors have been retained from the previous rule, the certification by the engineer that these factors are met and that the design will ensure stability of the fill better serves the purpose intended by the requirement for a "demonstration."

SECTION 816.73(d)

Final Section 816.73(d) requires the fill to be designed to attain a minimum long-term static safety factor of 1.5 and an earthquake safety factor of 1.1. This provision, which was part of the proposed general requirements for all

excess spoil fills, has been set out specifically here as was done in the previous durable rock fill rule. These provisions

are unchanged from the previous rule.

SECTION 816.73(e)

A new provision in final Section 816.73(e) allows for the underdrain system to be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials if the underdrain can carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area, and meet all other requirements for drainage control. This provision is included to further clarify OSM's acceptance of this type of underdrain, which previously had been treated as an assumed, standard part of a rock fill and not in need of further explanation. Because of the certification requirements in Section 816.71(h) and commenters' confusion, the use of a natural segregation rock underdrain in a durable rock fill is specifically provided for in this paragraph.

As previously mentioned, the construction quality control rules for excess spoil fills are also revised to clear up the inconsistency between the use of the gravity placement method for durable rock fills and the requirement for color photographs of the underdrain prior to placement of the excess spoil. As several commenters pointed out, photographs cannot be taken of an underdrain prior to placement of the excess spoil if the underdrain is created by the natural segregation of dumped rock as normally happens in the use of durable rock fills.

SECTION 816.73(f)

Final Section 816.73(f) requires that surface runoff be prevented from flowing onto the fill and be diverted into diversions channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event in accordance with proposed Section 816.43. These provisions, which were part of the general requirements for all excess spoil fills in the proposed rule, have been set out specifically in this paragraph as was done in the previous durable rock fill rule for clarity. The change in Section 816.73(f) of the precipitation event from the previous rule (100-year, 24-hour) follows the same reasoning as supplied for use of the 100-year, 6-hour storm event in Section 816.72(a)(2).

The changes in final Section 816.73 were prompted by the comments summarized earlier in this preamble under General Comments and should correct any misunderstanding concerning OSM's policy on durable rock fills. Further discussion of the use of durable rock fills and gravity placement can be found in the preamble of the March 13, 1979 rules *(44 FR 15207)*.

SECTION 816.74 - DISPOSAL OF EXCESS SPOIL: PRE-EXISTING BENCHES.

Final Section 816.74 provides for the disposal of excess spoil on preexisting benches. Paragraphs (a) through (d) of this section were adopted as a separate final rule in Section 816.75 on April 29, 1982 *(47 FR 18553)*. With a few revisions, it is being readopted today for the same reasons and with the same legal justification as was expressed in the Federal Register preamble to the April 29 rule. It was reproposed on June 8, 1982, as part of the reorganization of the excess spoil rules and to allow its environmental effects to be considered in the FEIS. This optional method of disposing of excess spoil will help to achieve the important goal of reclaiming abandoned mine lands.

One commenter felt that one of OSM's justifications for allowing such disposal -- "that preexisting benches are inherently more stable than spoil placed on valley soils" -- was not supported by an studies and was in fact untrue. The commenter said that preexisting benches often consist of unstable highwalls, have excessive seepage and unstable spoil at the perimeter of the bench. The commenter believed that before placement of excess spoil is permitted on existing benches, a complete foundation and drainage pattern analysis should be conducted.

The final rules ensure stability of the backfill. According to final Section 816.71(d) the operator must perform a foundation investigation and laboratory testing of materials as the first step in determining design requirements of the fill. Final Section 816.71(f) requires further precautions be taken in terms of drainage control. The design of a fill using preexisting benches must meet the general requirements for fills as is stated in final Section 816.74(a).

SECTION 816.74(a)

Final Section 816.74(a) establishes which general requirements of Section 816.71 apply to disposal of excess spoil on preexisting benches. The general requirements referenced are necessary to ensure compliance with the performance standards of the Act. No comments were received on Section 816.74(a) and the rule is adopted as proposed. Final Section 816.74 is consistent with Section 515 (b) and (d) of the Act.

SECTION 816.74(b)

Final Section 816.74(b) requires that excess spoil disposed of through placement on a preexisting bench be placed only on the solid portion of the bench. The requirement is considered necessary to assure compliance with the Act. No comments were received on this paragraph and it is adopted as proposed.

SECTION 816.74(c)

Final Section 816.74(c) requires the fill to be designed, using current, prudent engineering practices, and to attain a 1.3 static safety factor to ensure stability of the fill. The requirement is considered necessary to assure compliance with the Act and is consistent with the requirements of Section 816.102 for backfilling overburden in mined-out areas. No comments were received on this paragraph, however, an editorial change was made requiring the fill be designed using "current, prudent engineering practices" rather than "standard geotechnical analysis." The change was made to be consistent with MSHA rules as discussed previously with regard to Section 816.71(f)(3).

SECTION 816.74(d)

Final Section 816.74(d) outlines the backfilling and grading requirements for disposing of excess spoil on a preexisting bench. One commenter felt the requirements of Section 816.74(d) (1) and (2) could be interpreted to be in direct conflict with each other. The commenter stated that the most moderate slope possible could result in a slope much flatter than the angle of repose thus using more material than might be necessary and reducing the spoil available to eliminate the highwall. The question could then be raised whether the highwall was eliminated to the maximum extent technically practical. The commenter further stated that the elimination of the highwall can be measured both vertically and longitudinally along the bench.

The elimination of the highwall to the maximum extent technically practical is difficult to define to cover all possible situations. The requirements of Section 816.74(d) (1) and (2) are performance standards that require design determination on a site-by-site basis. OSM disagrees that these two standards conflict with each other. The most moderate slope possible in most cases will be consistent with the slope used in the design analysis for determination of the 1.3 safety factor as required by final Section 816.74(c). The elimination of the highwall to the extent practicable was defined in the proposed rules of June 8, 1982 *(47 FR 24959),* as "that portion of the highwall that is both technically and economically feasible to eliminate using available excess spoil." Paragraph(d)(2) is changed to read "to the maximum extent technically practical," in order to clarify the concept to be consistent with the interim final rule on steep slope remaining published November 12, 1982 *(47 FR 51316).* This change was made to emphasize that the Act does not require operators to employ extraordinary physical measures to eliminate the highwall where there is not enough excess spoil to do so. In the proposed rule preamble *(47 FR 24959)* it was also made clear that, in the case where an operator has chosen to eliminate a higher portion of the highwall over a shorter horizontal distance, rather than a longer section of highwall at a lower height, the regulatory authority would have to determine the practicability of the plan and approve or disapprove it.

SECTION 816.74(e)

Final Section 816.74(e) outlines the provisions for the controlled gravity transport of excess spoil from an actively mined, upper bench to an existing lower bench. The proposed rules essentially repeated the previously published final rules (July 17, 1981, *46 FR 37332,* and August 11, 1980, *45 FR 53138).* Some editorial changes have been made to improve the clarity of the requirements. The provision requiring a demonstration that the excess spoil disposed of by

gravity transport is not necessary for elimination of the highwall or AOC was deleted because this requirement is now

implicit in the definition of excess spoil in Section 701.5.

One commenter alleged that the gravity transport method proposed would reinstitute the practice of "end-dumping" excess spoil. The preamble discussions for the previous rulemaking indicate the rules were designed to allow controlled transport of excess spoil only, and to prohibit the past practice of "uncontrolled" end dumping.

SECTION 816.74(e)(1)

Final Section 816.74(e)(1) requires the transport courses to be specifically located and approved by the regulatory authority. No comments were received on this provision and it is adopted as proposed with two exceptions. The term "courses" replaces "points" because it better describes the fact that the material will travel a path between the benches which should be approved rather than just the point of discharge. Also, the requirement to minimize damage has been extended to areas between the benches and outside the set course. This is consistent with final Section 816.74(e)(4) which allows gravity transport in some instances where the transport course will pass over a natural slope.

SECTION 816.74(e)(2)

Final Section 816.74(e)(2) requires the excess spoil to be placed in a controlled manner in horizontal lifts, compacted to ensure mass stability and graded to allow surface and subsurface drainage to be compatible with the natural surroundings, and to ensure a minimum long-term static safety factor of 1.3.

One commenter asserted that excess spoil should not be placed and compacted in horizontal lifts as required in final Section 816.74(e)(2) but rather placed to attain a 1.3 static safety factor as required in Section 816.74(c).

The requirement for horizontal lifts in Section 816.74(e)(2) is consistent with the general placement requirements for excess spoil under final Section 816.71(e)(2) as referenced by Section 816.74(a). The horizontal dimension of the lift is dependent on the amount of solid bench, the design of the fill and the approval of the regulatory authority. Section 816.71(e)(2) also allows the regulatory authority to approve lifts greater than the 4-foot thickness. With this flexibility, the combination of the 1.3 static safety factor and the compacted horizontal lifts should provide no complication or burden to the engineer. Therefore, final Section 816.74(e)(2) is adopted as proposed, with one change to clarify that preexisting spoil that is disturbed must also be reclaimed.

SECTION 816.74(e)(3)

Final Section 816.74(e)(3) requires the construction of a safety berm on the solid portion of the lower bench when excess spoil is gravity transported. No comments were received on this provision and it is adopted as proposed.

SECTION 816.74(e)(4)

Final Section 816.74(e)(4) is a new provision stating the reclamation requirements for the gravity transport course. The paragraph prohibits excess spoil on the downslope below the upper bench except at designated gravity transport courses. The final rule also prohibits excess spoil from remaining on the designated transport courses after completion of the fill and requires that each transport course be properly reclaimed. This provision was added to ensure that there will be a controlled placement of excess spoil and the entire area will be properly reclaimed. Proposed Section 816.71(c)(2)(vi) would have required the lower bench to be considered an "affected area." Under the previous definition of the "permit area," which included all "affected areas," the lower bench would thus be subject to reclamation requirements. The new Paragraph (e)(4) more explicitly covers the need to have all disturbed areas properly reclaimed.

Two commenters were concerned with the proposed prohibition of natural slope between the highwall and the upper bench. One commenter requested that natural slopes between the highwall of the lower bench and the upper actively mined bench be allowed. The commenter felt the proposed prohibition precluded gravity transport since in most instances there would be some natural slope between the highwall of the preexisting unreclaimed mine and the bench of the new mine. The commenter said these slopes usually are only a short slope distance and would be

disturbed anyway by the new operation during reclamation. Therefore, he said, there is no rationale for the constraining requirement. The commenter noted that since both areas would be part of the permit area it should be assumed that the regulatory authority will require reclamation of all natural slopes as well as the new mining area and the preexisting mining area.

Another commenter requested that this provision require that no natural slope be allowed "other than the natural slope of the undisturbed natural barriers required by Section 816.99(a)." The commenter said this wording change was needed because the gravity transport method would never apply because there would always be some natural slope due to the undisturbed berm.

The final rule does not adopt the proposed provision that would have limited the use of the gravity transport method to only those areas where the highwall of the lower bench meets the upper actively mined bench with no natural slope between them. This was done to recognize the need for a natural barrier between benches in many instances. Previously the rules had allowed gravity transport only where benches intersected with no natural slope between them. Since Section 515(b)(25) of the Act requires a natural berm to be left to prevent sliding or erosion, the chance of the benches intersecting naturally with no "natural" slope between them will be very small. However, the natural slope maintained as part of the natural barrier should not necessarily prohibit gravity transport.

OSM will not allow excess spoil to be "placed" -- meaning to be permanently stored or located -- on the downslope of the natural slope between the benches. Section 515(d)(1) of the Act does not allow such placement on steep slopes and, in other instances, the requirements of Section 515(b)(22) of the Act will not be met. OSM will permit, however, a small specified portion of the downslope to be prepared, under the topsoil rule in Section 816.22, to act as a gravity transport course for transporting excess spoil to the lower bench. The important aspect of this new provision in Section 816.(e)(4) is that the excess spoil is never allowed to be "placed" on the transport course -- it may not remain there permanently and the angle of the course should be such that the effect of gravity should move it quickly to the lower bench. The excess spoil must be hauled to the gravity transport course point on the upper bench and released to fall down the course for rehandling into compacted horizontal lifts on the lower bench. This shall be permitted only with the approval of the regulatory authority, and only if no excess spoil remains on the course at the completion of the fill and the course is properly controlled and reclaimed.

The phrase "gravity transport point" was changed to "gravity transport course" to better describe the actual area disturbed since a natural slope is allowed between the two benches for this disposal method.

The final rule also does not adopt the proposed provision that would h ave limited the use of the gravity transport method to only those areas where excess spoil can be placed on a solid portion of a lower preexisting bench. This was not included because it is already necessary that the fill meet the 1.3 static safety factor in addition to the foundation investigations required in Section 816.71.

OSM addressed the issue of the natural slope between benches in two previous rulemakings, July 17, 1981 *(46 FR 57233)* and August 11, 1980 *(45 FR 53184)*. Readers are referred to those preambles for further discussion on the subject.

SECTION 817.71 - UNDERGROUND MINING ACTIVITIES.

As previously mentioned the bases and purposes of Sections 816.71-816.74 and 817.71-817.74 are the same. All public comments discussed in the portion of the preamble relating to Sections 816.71-816.74 were considered and similarly disposed of with respect to Sections 817.71-817-74 because the differences between underground and surface mining generally do not justify differences in excess spoil disposal requirements between structures associated with surface mining and those associated with underground mining. In effect, disposal of excess spoil from underground activities pursuant to these sections will provide, and is necessary to ensure, the same level of protection for the environment and public health and safety as to be required for the disposal of excess spoil associated with surface mining.

The reader is referred to Sections 816.71-816.74 for a discussion of comments and issues relevant to Sections

817.71-817.74. The only difference in the sections occurs in Section 817.71(k). This section provides an additional provision for placement of spoil from a face-up operation at drift entries. This material may be placed at a drift entry as part of a cut and fill structure, if this structure is to be less than 400 feet in horizontal length and is designed according to the rest of the standards of Section 817.71. By using some of the spoil at the drift entry, a smaller excavation in the hillside is needed to prepare to build a working area for the mine. No comments were received on this provision and it is adopted as proposed.

REFERENCE MATERIALS

Reference materials used to develop these final rules are the same as those listed in the proposed rules *(47 FR 24960)* and the previous rules *(44 FR 15213* and *44 FR 15205).*

III. PROCEDURAL MATTERS

Executive Order 12291 and the Regulatory Flexibility Act

The Department of the Interior has determined that this document is not a major rule under Executive Order 12291 and certifies that this document will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act *(5 U.S.C. 601* et seq). The rule will impose only minor costs on the coal industry and coal consumers because it emphasizes the use of performance standards instead of design criteria, which will allow operators to utilize the most cost-effective means of achieving the performance standards. The rule should especially ease the regulatory burden of small coal operations in Appalachia.

Paperwork Reduction Act

The information collection requirements in existing 30 CFR Parts 816 and 817 were approved by the Office of Management and Budget (OMB) under *44 U.S.C. 3507* and assigned clearance numbers 1029-0047 and 1029-0048. OSM has codified the OMB approvals under new Sections 816.10 and 817.10. The information required by 30 CFR Parts 816 and 817 will be used by the regulatory authority in monitoring and inspecting surface and underground mining activities to ensure that they are conducted in a manner which preserves and enhances environmental and other values of the Act. This information required by 30 CFR Parts 816 and 817 is mandatory.

National Environmental Policy Act

OSM has analyzed the impacts of these final rules in the "Final Environmental Impact Statement OSM EIS-1: Supplement," in accordance with Section 102(2)(C) of the National Environmental Policy Act of 1969 *(42 U.S.C. 4332*(2)(C)). The final EIS is available in OSM's Administrative Record in Room 5315, 1100 L Street, NW., Washington, D.C., or by mail request to Mark Boster, Chief, Branch of Environmental Analysis, Room 134, Interior South Building, U.S. Department of the Interior, Washington, D.C. 20240.

This preamble serves as the record of decision under NEPA. The following differences are noted between this final rule and the preferred alternative in the EIS: (1) A definition of excess spoil is added which incorporates concepts of the treatment of excess spoil which were analyzed in the EIS; (2) The provisions on disposal of excess spoil have been reorganized and split into different sections which has no effect on the analysis of environmental effects; (3) Sections 816.72(b) and 817.72(b), covering construction of rock-core chimney drains in head-of-hollow/valley fills, has been added with minor revisions from the previous rules, the environmental effects of which were analyzed under the No Action alternative; (4) The previous provision concerning construction of keyway cuts or rock toe buttresses was retained without change, the environmental effects of which were analyzed in the No Action alternative; and (5) The certification requirement in Sections 816.71(h)(2) and 817.71(h)(2) has been modified slightly to require that fills be constructed and maintained "as designed." Although the fills do not have to be certified as "stable," any apparent instability must be described. Because these modifications do not change the inspection frequency, the level of examination and analysis, or the requirement to file certified reports, they have no environmental effect.

LIST OF SUBJECTS

30 CFR Part 701
Coal mining, Law enforcement, Surface mining, and Underground mining.

30 CFR Part 816
Coal mining, Environmental protection, Reporting and recordkeeping requirements, and Surface mining.

30 CFR Part 817
Coal mining, Environmental protection, Reporting and recordkeeping requirements, and Underground mining.

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

Dated: July 14, 1983.
J. J. Simmons III, Under Secretary.

PART 701 -- PERMANENT REGULATORY PROGRAM

1. In Section 701.5 the definition of Excess spoil is added alphabetically and the definitions of Head-of-hollow fill, Underground development waste, and Valley fill are revised to read as follows:

SECTION 701.5 - DEFINITIONS.

* * * * *

EXCESS SPOIL means spoil material disposed of in a location other than the mined-out area; provided that spoil material used to achieve the approximate original contour or to blend the mined-out area with the surrounding terrain in accordance with Sections 816.102(c) and 817.102(c) of this chapter in non-steep slope areas shall not be considered excess spoil.

* * * * *

HEAD-OF-HOLLOW FILL means a fill structure consisting of any material, other than organic material, placed in the uppermost reaches of a hollow where side slopes of the existing hollow, measured at the steepest point, are greater than 20 degrees or the average slope of the profile of the hollow from the toe of the fill to the top of the fill is greater than 10 degrees. In head-of-hollow fills the top surface of the fill, when completed, is at approximately the same elevation as the adjacent ridge line, and no significant area of natural drainage occurs above the fill draining into the fill area.

* * * * *

UNDERGROUND DEVELOPMENT WASTE means waste-rock mixtures of coal, shale, claystone, siltstone, sandstone, limestone, or related materials that are excavated, moved, and disposed of from underground workings in connection with underground mining activities.

* * * * *

VALLEY FILL means a fill structure consisting of any material, other than organic material, that is placed in a valley where side slopes of the existing valley, measured at the steepest point, are greater than 20 degrees, or where the average slope of the profile of the valley from the toe of the fill to the top of the fill is greater than 10 degrees.

* * * * *

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

2. Section 816.71 is revised to read as follows:

SECTION 816.71 - DISPOSAL OF EXCESS SPOIL: GENERAL REQUIREMENTS.

(a) General. Excess spoil shall be placed in designated disposal areas within the permit area, in a controlled manner to --

(1) Minimize the adverse effects of leachate and surface water runoff from the fill on surface and ground waters;

(2) Ensure mass stability and prevent mass movement during and after construction; and

(3) Ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

(b) Design certification.

(1) The fill and appurtenant structures shall be designed using current, prudent engineering practices and shall meet any design criteria established by the regulatory authority. A qualified registered professional engineer experienced in the design of earth and rock fills shall certify the design of the fill and appurtenant structures.

(2) The fill shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.

(c) Location. The disposal area shall be located on the most moderately sloping and naturally stable areas available, as approved by the regulatory authority, and shall be placed, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

(d) Foundation.

(1) Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures.

(2) Where the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the regulatory authority based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to ensure stability of the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed in accordance with Section 780.35(c) of this chapter to determine the size of rock toe buttresses and keyway cuts.

(e) Placement of excess spoil.

(1) All vegetative and organic materials shall be removed from the disposal area prior to placement of the excess spoil. Topsoil shall be removed, segregated and stored or redistributed in accordance with Section 816.22. If approved by the regulatory authority, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation or increase the moisture retention of the soil.

(2) Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding 4 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material in accordance with Section 816.22 of this chapter. The regulatory authority may approve a design which incorporates placement of excess spoil in horizontal lifts other than 4-feet in thickness when it is demonstrated by the operator and certified by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.

(3) The final configuration of the fill shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h: 1v (50 percent).

(4) No permanent impoundments are allowed on the completed fill. Small depressions may be allowed by the regulatory authority if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with stability of the fill.

(5) Excess spoil that is acid- or toxic-forming or combustible shall be adequately covered with nonacid, nontoxic and noncombustible material, or treated, to control the impact on surface and ground water in accordance with Section 816.41, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

(f) Drainage control.

(1) If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill, and ensure stability.

(2) Diversions shall comply with the requirements of Section 816.43.

(3) Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices and meet any design criteria established by the regulatory authority. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid-,nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil material, and which is free of coal, clay or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

(g) Surface area stabilization. Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.

(h) Inspections. A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, shall periodically inspect the fill during construction. The professional engineer or specialist shall be experienced in the construction of earth and rock fills.

(1) Such inspections shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include at a minimum: (i) Foundation preparation, including the removal of all organic material and topsoil; (ii) placement of underdrains and protective filter systems; (iii) installation of final surface drainage systems; and (iv) the final graded and revegetated fill. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials.

(2) The qualified registered professional engineer shall provide a certified report to the regulatory authority promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the approved plan and this chapter. The report shall include appearances of instability, structural weakness, and other hazardous conditions.

(3) (i) The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with excess spoil. If the underdrain system is constructed in phases, each phase shall be certified separately.

(ii) Where excess durable rock spoil is placed in single or multiple lifts such that the underdrain system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, in accordance with Section 816.73, color photographs shall be taken of the underdrain as the underdrain system is being formed.

(iii) The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site.

(4) A copy of each inspection report shall be retained at or near the mine site.

(i) Coal mine waste. Coal mine waste may be disposed of in excess spoil fills if approved by the regulatory authority and, if such waste is –

(1) Placed in accordance with Section 816.83;

(2) Nontoxic and nonacid forming; and

(3) Of the proper characteristics to be consistent with the design stability of the fill.

(j) Underground disposal. Excess spoil may be disposed of in underground mine workings, but only in accordance with a plan approved by the regulatory authority and MSHA under Section 784.25 of this chapter.

3. Section 816.72 is revised to read as follows:

SECTION 816.72 - DISPOSAL OF EXCESS SPOIL: VALLEY FILLS/HEAD-OF-HOLLOW FILLS.

Valley fills and head-of-hollow fills shall meet the requirements of Section 816.71 and the additional requirements of this section.

(a) Drainage control.

(1) The top surface of the completed fill shall be graded such that the final slope after settlement will be toward properly designed drainage channels. Uncontrolled surface drainage may not be directed over the outslope of the fill.

(2) Runoff from areas above the fill and runoff from the surface of the fill shall be diverted into stabilized diversion channels designed to meet the requirements of Section 816.43 and, in addition, to safely pass the runoff from a 100-year, 6-hour precipitation event.

(b) Rock-core chimney drains. A rock-core chimney drain may be used in a head-of-hollow fill, instead of the underdrain and surface diversion system normally required, as long as the fill is not located in an area containing intermittent or perennial streams. A rock-core chimney drain may be used in a valley fill if the fill does not exceed 250,000 cubic yards of material and upstream drainage is diverted around the fill. The alternative rock-core chimney drain system shall be incorporated into the design and construction of the fill as follows.

(1) The fill shall have, along the vertical projection of the main buried stream channel or rill, a vertical core of durable rock at least 16 feet thick which shall extend from the toe of the fill to the head of the fill, and from the base of the fill to the surface of the fill. A system of lateral rock underdrains shall connect this rock core to each area of potential drainage or seepage in the disposal area. The underdrain system and rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area. Rocks used in the rock core and underdrains shall meet the requirements of Section 816.71(f).

(2) A filter system to ensure the proper long-term functioning of the rock core shall be designed and constructed using current, prudent engineering practices.

(3) Grading may drain surface water away from the outslope of the fill and toward the rock core. In no case, however, may intermittent or perennial streams be diverted into the rock core. The maximum slope of the top of the fill shall be 33h:1v (3 percent). A drainage pocket may be maintained at the head of the fill during and after construction, to intercept surface runoff and discharge the runoff through or over the rock drain, if stability of the fill is not impaired. In no case shall this pocket or sump have a potential capacity for impounding more than 10,000 cubic feet of water. Terraces on the fill shall be graded with a 3 to 5 percent grade toward the fill and a 1 percent slope toward the rock core.

4. Section 816.73 is revised to read as follows:

SECTION 816.73 - DISPOSAL OF EXCESS SPOIL: DURABLE ROCK FILL.

The regulatory authority may approve the alternative method of disposal of excess durable rock spoil by gravity placement in single or multiple lifts, provided the following conditions are met:

(a) Except as provided in this section, the requirements of Section 816.71 are met.

(b) The excess spoil consists of at least 80 percent, by volume, durable, nonacid- and nontoxic-forming rock (e.g.,

sandstone or limestone) that does not slake in water and will not degrade to soil material. Where used, noncemented clay shale, clay spoil, soil or other nondurable excess spoil materials shall be mixed with excess durable rock spoil in a controlled manner such that no more than 20 percent of the fill volume, as determined by tests performed by a registered engineer and approved by the regulatory authority, is not durable rock.

(c) A qualified registered professional engineer certifies that the design will ensure the stability of the fill and meet all other applicable requirements.

(d) The fill is designed to attain a minimum long-term static safety factor of 1.5, and an earthquake safety factor of 1.1.

(e) The underdrain system may be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, provided the resulting underdrain system is capable of carrying anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and the other requirements for drainage control are met.

(f) Surface water runoff from areas adjacent to and above the fill is not allowed to flow onto the fill and is diverted into stabilized diversion channels designed to meet the requirements of Section 816.43 and to safely pass the runoff from a 100-year, 6-hour precipitation event.

5. Section 816.74 is revised to read as follows:

SECTION 816.74 - DISPOSAL OF EXCESS SPOIL: PREEXISTING BENCHES.

(a) The regulatory authority may approve the disposal of excess spoil through placement on preexisting benches, provided that all the standards set forth in Section 816.71(a), (b)(1), (d) through (i) and the requirements of this section are met.

(b) Excess spoil shall be placed only on the solid portion of the preexisting bench.

(c) The fill shall be designed, using current, prudent engineering practices, to attain a long-term static safety factor of 1.3 for all portions of the fill.

(d) The preexisting bench shall be backfilled and graded to --

(1) Achieve the most moderate slope possible which does not exceed the angle of repose, and

(2) Eliminate the highwall to the maximum extent technically practical.

(e) Disposal of excess spoil from an upper actively mined bench to a lower preexisting bench by means of gravity transport may be approved by the regulatory authority provided that --

(1) The gravity transport courses are determined on a site specific basis by the operator as part of the permit application and approved by the regulatory authority to minimize hazards to health and safety and to ensure that damage will be minimized between the benches, outside the set course, and downslope of the lower bench should excess spoil accidentally move;

(2) All gravity transported excess spoil, including that excess spoil immediately below the gravity transport courses and any preexisting spoil that is disturbed, is rehandled and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and to prevent mass movement, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and to ensure a minimum long-term static safety factor of 1.3. Excess spoil on the bench prior to the current mining operation that is not disturbed need not be rehandled except where necessary to ensure stability of the fill;

(3) A safety berm is constructed on the solid portion of the lower bench prior to gravity transport of the excess spoil. Where there is insufficient material on the lower bench to construct a safety berm, only that amount of

excess spoil necessary for the construction of the berm may be gravity transported to the lower bench prior to

construction of the berm.

(4) Excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity transport courses properly prepared according to Section 816.22. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity transport course between the two benches and each transport course shall be reclaimed in accordance with the requirements of this part.

SECTION 817.75 [Removed.]

6. Section 816.75 is removed.

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

7. Section 817.71 is revised to read as follows:

SECTION 817.71 - DISPOSAL OF EXCESS SPOIL: GENERAL REQUIREMENTS.

(a) General. Excess spoil shall be placed in designated disposal areas within the permit area, in a controlled manner to --

(1) Minimize the adverse effects of leachate and surface water runoff from the fill on surface and ground waters;

(2) Ensure mass stability and prevent mass movement during and after construction; and

(3) Ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

(b) Design certification.

(1) The fill and appurtenant structures shall be designed using current, prudent engineering practices and shall meet any design criterial established by the regulatory authority. A qualified registered professional engineer experienced in the design of earth and rock fills shall certify the design of the fill and appurtenant structures.

(2) The fill shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments at the fill must be stable under all conditions of construction.

(c) Location. The disposal area shall be located on the most moderately sloping and naturally stable areas available, as approved by the regulatory authority, and shall be placed, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

(d) Foundation.

(1) Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures.

(2) When the slope in the disposal area is in excess of 2.8h:lv (36 percent), or such lesser slope as may be designated by the regulatory authority based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to ensure stability of the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed in accordance with Section 784.19 of this chapter to determine the size of rock toe buttresses and keyway cuts.

(e) Placement of excess spoil.

(1) All vegetative and organic materials shall be removed from the disposal area prior to placement of excess spoil. Topsoil shall be removed, segregated and stored or redistributed in accordance with Section 817.22. If

approved by the regulatory authority, organic material may be used as mulch or may be included in the topsoil to

control erosion, promote growth of vegetation or increase the moisture retention of the soil.

(2) Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding 4 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material in accordance with Section 816.22 of this chapter. The regulatory authority may approve a design which incorporates placement of excess spoil in horizontal lifts other than 4 feet in thickness when it is demonstrated by the operator and certified by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.

(3) The final configuration of the fill shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:lv (50 percent).

(4) No permanent impoundments are allowed on the completed fill. Small depressions may be allowed by the regulatory authority if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

(5) Excess spoil that is acid- or toxic-forming or combustible shall be adequately covered with nonacid, nontoxic and noncombustible material, or treated, to control the impact on surface and ground water in accordance with Section 817.41, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

(f) Drainage control.

(1) If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill, and ensure stability.

(2) Diversions shall comply with the requirements of Section 817.43.

(3) Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices and meet any design criteria established by the regulatory authority. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid-, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil materials, and which is free of coal, clay or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

(g) Surface area stabilization. Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.

(h) Inspections. A qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer, shall periodically inspect the fill during construction. The professional engineer or specialist shall be experienced in the construction of earth and rock fills.

(1) Such inspection shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include at a minimum: (i) Foundation preparation including the removal of all organic material and topsoil; (ii) placement of underdrains and protective filter systems; (iii) installation of final surface drainage systems; and (iv) the final graded and revegetated fill. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials.

(2) The qualified registered professional engineer shall provide, to the regulatory authority, a certified report promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the approved plan and this chapter. The report shall include appearances of instability, structural weakness, and other hazardous conditions.

(3)(i) The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with excess spoil. If the underdrain system is constructed in phases, each phase shall be certified separately.

(ii) Where excess durable rock spoil is placed in single or multiple lifts such that the underdrain

system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, in accordance with Section 817.73, color photographs shall be taken of the underdrain as the underdrain system is being formed.

(iii) The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site.

(4) A copy of each inspection report shall be retained at or near the minesite.

(i) Coal mine waste. Coal mines waste may be disposed of in excess spoil fills if approved by the regulatory authority and, if such waste is –

(1) Placed in accordance with Section 817.83;

(2) Nontoxic and nonacid forming; and

(3) Of the proper characteristics to be consistent with the design stability of the fill.

(j) Underground disposal. Excess spoil may be disposed of in underground mine workings, but only in accordance with a plan approved by the regulatory authority and MSHA under Section 784.25 of this chapter.

(k) Face-up operations. Spoil resulting from face-up operations for underground coal mine development may be placed at drift entries as part of a cut and fill structure, if the structure is less than 400 feet in horizontal length, and designed in accordance with Section 817.71.

8. Section 817.72 is revised to read as follows:

SECTION 817.72 - DISPOSAL OF EXCESS SPOIL: VALLEY FILL/HEAD-OF-HOLLOW FILLS.

Valley fills and head-of-hollow fills shall meet the requirements of Section 817.71 and the additional requirements of this section.

(a) Drainage control.

(1) The top surface of the completed fill shall be graded such that the final slope after settlement will be toward properly designed drainage channels. Uncontrolled surface drainage may not be directed over the outslope of the fill.

(2) Runoff from areas above the fill and runoff from the surface of the fill shall be diverted into stabilized diversion channels designed to meet the requirements of Section 817.43 and to safely pass the runoff from a 100-year, 6-hour precipitation event.

(b) Rock-core chimney drains. A rock-core chimney drain may be used in a head-of-hollow fill, instead of the underdrain and surface diversion system normally required, as long as the fill is not located in an area containing intermittent or perennial streams. A rock-core chimney drain may be used in a valley fill if the fill does not exceed 250,000 cubic yards of material and upstream drainage is diverted around the fill. The alternative rock-core chimney drain system shall be incorporated into the design and construction of the fill as follows:

(1) The fill shall have, along the vertical projection of the main buried stream channel or rill, a vertical core of durable rock at least 16 feet thick which shall extend from the toe of the fill to the head of the fill, and from the base of the fill to the surface of the fill. A system of lateral rock underdrains shall connect this rock core to each area of potential drainage or seepage in the disposal area. The underdrain system and rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area. Rocks used in the rock core and underdrains shall meet the requirements of Section 817.71(f).

(2) A filter system to ensure the proper long-term functioning of the rock core shall be designed and constructed using current, prudent engineering practices.

(3) Grading may drain surface water away from the outslope of the fill and toward the rock core. In no case, however, may intermittent or perennial streams be diverted into the rock core. The maximum slope of the top of the fill shall be 33h:lv (3 percent). A drainage pocket may be maintained at the head of the fill during and after

construction, to intercept surface runoff and discharge the runoff through or over the rock drain, if stability of the fill is not impaired. In no case shall this pocket or sump have a potential capacity for impounding more than 10,000 cubic feet of water. Terraces on the fill shall be graded with a 3 to 5 percent grade toward the fill and a 1 percent slope toward the rock core.

9. Section 817.73 is revised to read as follows:

SECTION 817.73 - DISPOSAL OF EXCESS SPOIL: DURABLE ROCK FILLS.

The regulatory authority may approve the alternative method of disposal of excess durable rock spoil by gravity placement in single or multiple lifts, provided the following conditions are met:

(a) Except as provided in this section, the requirements of Section 817.71 are met.

(b) The excess spoil consists of at least 80 percent, by volume, durable, nonacid- and nontoxic-forming rock (e.g. , sandstone or limestone) that does not slake in water and will not degrade to soil material. Where used, noncemented clay shale, clay spoil, soil or other nondurable excess spoil material shall be mixed with excess durable rock spoil in a controlled manner such that no more than 20 percent of the fill volume, as determined by tests performed by a registered engineer and approved by the regulatory authority, is not durable rock.

(c) A qualified registered professional engineer certifies that the design will ensure the stability of the fill and meet all other applicable requirements.

(d) The fill is designed to attain a minimum long-term static safety factor of 1.5, and an earthquake safety factor of 1.1.

(e) The underdrain system may be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, provided the resulting underdrain system is capable of carrying anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and the other requirements for drainage control are met.

(f) Surface water runoff from areas adjacent to and above the fill is not allowed to flow onto the fill and is diverted into stabilized diversion channels designed to meet the requirements of Section 817.43 and to safely pass the runoff from a 100-year, 6-hour precipitation event.

10. Section 817.74 is revised to read as follows:

SECTION 817.74 - DISPOSAL OF EXCESS SPOIL: PREEXISTING BENCHES.

(a) The regulatory authority may approve the disposal of excess spoil through placement on preexisting benches, provided that all the standards set forth in Section 817.71 (a), (b)(1), (d) through (i) and the requirements of this section are met.

(b) Excess spoil shall be placed only on the solid portion of the preexisting bench.

(c) The fill shall be designed, using current, prudent engineering practices, to attain a long-term static safety factor of 1.3 for all portions of the fill.

(d) The preexisting bench shall be backfilled and graded to --

(1) Achieve the most moderate slope possible which does not exceed the angle of repose, and

(2) Eliminate the highwall to the maximum extent technically practical.

(e) Disposal of excess spoil from an upper actively mined bench to a lower preexisting bench by means of gravity transport may be approved by the regulatory authority provided that –

(1) The gravity transport courses are determined on a site-specific basis by the operator as part of the permit application and approved by the regulatory authority to minimize hazards to health and safety and to ensure that damage will be minimized between the benches, outside the set course, and downslope of the lower bench should excess spoil accidentally move;

(2) All gravity transported excess spoil, including that excess spoil immediately below the gravity transport courses and any preexisting spoil that is disturbed, is rehandled and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and to prevent mass movement, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and to ensure a minimum long-term static safety factor of 1.3. Excess spoil on the bench prior to the current mining operation that is not disturbed need not be rehandled except where necessary to ensure stability of the fill;

(3) A safety berm is constructed on the solid portion of the lower bench prior to gravity transport of the excess spoil. Where there is insufficient material on the lower bench to construct a safety berm, only that amount of excess spoil necessary for the construction of the berm may be gravity transported to the lower bench prior to construction of the berm;

(4) Excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity transport courses properly prepared according to Section 816.22. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity transport course between the two benches and each transport course shall be reclaimed in accordance with the requirements of this part.

SECTION 817.75 [Removed]

11. Section 817.75 is removed.

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

[FR Doc. 83-19073 Filed 7-18-83; 8:45 am]
BILLING CODE 4310-05-M