

**FEDERAL REGISTER: 53 FR 43584 (October 27, 1988)**

DEPARTMENT OF THE INTERIOR

AGENCY: Office of Surface Mining Reclamation and Enforcement (OSM)

30 CFR Parts 780, 784, 816 and 817

Surface Coal Mining and Reclamation Operations; Permanent Regulatory Program;  
Performance Standards; Permanent and Temporary Impoundments

ACTION: Final rule.

**SUMMARY:** The Office of Surface Mining Reclamation and Enforcement (OSMRE) of the United States Department of the Interior (DOI) is amending certain portions of its permanent program regulations governing permanent and temporary impoundments at surface and underground coal mining operations. Most of the revisions respond to a court decision; others respond to a 1986 amendment to the Surface Mining Control and Reclamation Act of 1977.

The rule, which includes design, construction and inspection requirements for impoundments: (1) Requires a minimum static safety factor for small impoundments; (2) requires stable foundations and abutments during all phases of construction for small impoundments; (3) establishes new spillway requirements for impoundments; (4) establishes a distinction between impoundments based on size and potential adverse effects resulting from impoundment failure; and (5) authorizes qualified registered professional land surveyors to inspect small impoundments and to certify the construction of siltation structures.

EFFECTIVE DATE: November 28, 1988.

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**SUPPLEMENTARY INFORMATION:**

- I. Background
- II. Discussion of Final Rule and Comments
- III. Procedural Matters

**I. BACKGROUND**

The Surface Mining Control and Reclamation Act of 1977 ("the Act" or SMCRA), *30 U.S.C. 1201 et seq.*, sets forth general regulatory requirements governing surface coal mining and the surface impacts of underground coal mining. Environmental protection performance standards for permanent water impoundments constructed during surface mining activities appear in section 515(b)(8) of the Act, *30 U.S.C. 1265(b)(8)*, and provisions governing the construction of siltation structures appear in section 515(b)(10)(B), *30 U.S.C. 1265(b)(10)(B)*. Sections 516(b)(9) and (10) of the Act, *30 U.S.C. 1266(b)(9) and (10)*, authorize similar regulation of water impoundments and siltation structures for underground mining activities. Section 516(b)(10) further provides that the Secretary shall make such modifications in these requirements as are necessary to accommodate the distinct differences between surface mining and underground mining.

The permanent regulatory program for surface coal mining and reclamation operations was promulgated on March 13, 1979 (*44 FR 15312*). Requirements for sedimentation ponds at surface mining activities were established at 30 CFR 816.46 (*44 FR 15400*), while those for underground mining activities were established at 30 CFR 817.46 (*44 FR 15426*). OSMRE implemented the provisions of section 515(b)(10)(B) of the Act for siltation structures by establishing requirements for sedimentation ponds. At that time, OSMRE considered sedimentation ponds to be the "best technology currently available" for controlling sediment movement from surface coal mining operations.

Requirements for permanent and temporary impoundments at surface and underground mining activities were established in the 1979 rules at 30 CFR 816.49 (*44 FR 15401*) and 30 CFR 817.49 (*44 FR 15428*), respectively.

Permitting requirements for reclamation and operation plans for impoundments at surface activities and underground mining activities were established in the 1979 rules at 30 CFR 780.25 (*44 FR 15360*) and 30 CFR 784.16 (*44 FR 15368*), respectively.

Section 816.49 regulates all types of impoundments whether they are temporary or permanent. The terms "impoundment," "impoundment structure," "permanent impoundment" and "temporary impoundment" are defined at 30 CFR 701.5. In addition to the regulations governing all impoundments, there are special regulations covering specific types of impoundments. At Section 816.46 are regulations covering siltation structures. Requirements for coal mine waste impounding structures are provided at Section 816.84. These special provisions supplement the guidance provided at Section 816.49 for these special categories of impounding structures.

In promulgating the 1979 rules, and again in the 1983 rules, OSMRE did not identify any differences between impoundments for surface and underground mines that necessitated different regulatory provisions. The permitting rules applicable to impoundments for surface mining activities at 30 CFR 780.25 and those for underground mining activities at 30 CFR 784.16 were identical. Similarly, the performance standards for surface mining activities at 30 CFR 816.46, 816.49, and 816.84 were identical to the rules for underground mining activities at 30 CFR 817.46, 817.49, and 817.84, respectively.

During revision of the permanent regulatory program in 1983, OSMRE replaced most of the specific design criteria in Section 816.46 (*48 FR 44051*) and Section 816.49 (*48 FR 44004*) with performance standards, thereby providing regulatory authorities greater flexibility in the administration of impoundment design. Section 816.46 was renamed "Hydrologic balance: Siltation Structures," to be consistent with the wording of section 515(b)(10)(B)(ii) of the Act and to reflect rule changes which allowed the use of siltation structures other than sedimentation ponds, such as chemical treatment facilities or mechanical structures. The 1983 rules at Sections 816.46 and 816.49 and related coal mine waste impounding structure provisions in Section 816.84(b), were challenged in the U.S. District Court for the District of Columbia in *In re Permanent Surface Mining Regulation Litigation, (In re Permanent II (Round III)) 620 F. Supp. 1519* (D.D.C. July 15, 1985).

The District Court remanded: (1) Sections 816.49(a)(3) and (a)(5)(i) because they included requirements for a static safety factor and for foundation investigation and laboratory testing of small sedimentation ponds without having included such requirements when the rule was proposed on June 21, 1982 (*47 FR 26754*), as required by the *Administrative Procedure Act* (*620 F. Supp. at 1568-1570*); and (2) Sections 816.49 and 816.84(b) to the extent they deferred to the Mine Safety and Health Administration (MSHA) impoundment classification standards when OSMRE had not separately justified reliance on such standards (*Id. at 1536-1537*). In addition, in response to plaintiff's challenge of the combination spillway requirement of Sections 816.49(a)(8) and 816.84(b)(1), the Secretary of the Interior agreed to propose a rule specifying that one spillway that can safely pass the design precipitation event may serve as a combination principal and emergency spillway. (*Id. at 1538 and 1571-1572.*)

On October 21, 1987 (*52 FR 39364*), OSMRE proposed to amend its permanent program regulations governing permanent and temporary impoundments at surface and underground mining operations. In addition to soliciting public comments and providing an opportunity for public hearings upon request, OSMRE provided a 70-day public comment period. OSMRE received comments from seventeen organizations, including State regulatory authorities, environmental groups and representatives of the coal industry. No public meeting was requested and none was held.

The remainder of this section of the preamble is organized by issues as follows: (1) Impoundment Size; (2) spillways; (3) stability; (4) foundations; (5) certification of Siltation Structures; and (6) inspection of Impoundments. Changes to the proposed rule and OSMRE's consideration of public comments are discussed in the subsequent section, "Discussion of Final Rule and Comments."

## **1. IMPOUNDMENT SIZE**

In both the 1979 and 1983 regulations at 30 CFR 816.49, OSMRE classified impoundments based on size and required larger impoundments to meet more stringent requirements than smaller impoundments. A similar classification was included in the 1983 rules for sedimentation ponds at 30 CFR 816.46(c)(2) and for coal mine waste impounding structures at 30 CFR 816.84(b).

OSMRE adopted the MSHA criteria for impounding structures in the 1979 rule (*44 FR 15401*) and continued to apply them in the 1983 rules. In 30 CFR 77.216, MSHA imposes minimum plan requirements for design, construction and maintenance information that take into account size and potential hazards to miners for certain impounding structures (see "Discussion of Final Rule and Comments" for specific MSHA criteria). Under Sections 816.46(c)(2) and 816.49 of the 1983 rules, structures meeting MSHA criteria were required to meet MSHA requirements. Similarly, the requirements for coal mine waste impounding structures in Section 816.84(b) of the 1983 rules were also based on the MSHA criteria.

In *In re Permanent II* (Round III), plaintiffs objected to OSMRE using this distinction between sizes of coal mine waste impounding structures in Section 816.84(b), contending that the distinction had the effect of resulting in less scrutiny for smaller impoundments. Plaintiffs maintained that OSMRE's deferral to the classification system used by MSHA was improper, and that OSMRE should independently classify impoundments. Plaintiffs contended that the Secretary had not justified using MSHA's distinction in terms of the Act.

The court remanded Section 816.84(b) insofar as it deferred to the MSHA criteria, finding that the Secretary must independently consider and justify the adoption of a distinction based on impoundment size, and that he had not properly justified using the MSHA criteria. (*620 F. Supp. at 1536-1537.*) The court also remanded Section 816.49 to the extent those provisions required a distinction between large and small impoundments. (*620 F. Supp. at 1537.*)

On November 20, 1986 (*51 FR 41958*), OSMRE announced its intention to propose a new rule to comply with the court order. After reconsidering the administrative record of the previous rules, as well as the legislative history of the Act and the opinion of the District Court, on October 21, 1987 (*52 FR 39364*), OSMRE proposed Sections 816.49(a), 816.46(c)(2) and 816.84(b). The criteria to determine which impoundments must meet the more stringent stability requirements of Section 816.49(a)(3) would be based on both size and a provision whereby a small impoundment would be subject to more stringent requirements if the regulatory authority determined that it was located where failure would be expected to cause loss of life or serious property damage. The justification for using these criteria is included in the subsequent "Discussion of Final Rule and Comments" section of this preamble.

## **2. SPILLWAYS**

The 1983 rules at 30 CFR 816.49(a)(8) and 816.84(b)(2) required that all impoundments, including coal mine waste impounding structures, include a combination of principal and emergency spillways designed and constructed to safely pass the design precipitation event. This requirement for a combination of spillways was challenged in *In re Permanent II* (Round III). The Secretary determined that the challenge had merit and stated his intention to propose a rule specifying that one spillway that can safely pass the design precipitation event may serve as a combination principal and emergency spillway. (*620 F. Supp. at 1538 and 1571-1572.*) On November 20, 1986 (*51 FR 41952*), OSMRE announced the suspension of Sections 816.49(a)(8) and 816.84(b)(2) to the extent that they required separate principal and emergency spillways where one spillway may safely pass the design precipitation event. Consistent with the Secretary's stated intent, OSMRE included proposed revisions to these sections in the October 21, 1987 (*52 FR 39364*), proposed rule.

## **3. STABILITY**

On June 21, 1982 (*47 FR 26760*), OSMRE proposed that static safety factors for impoundments be determined "by prudent engineering design." In response to comments on the 1982 proposal and in order to simplify the requirement, OSMRE adopted in Section 816.49(a)(3) of the 1983 rule (*48 FR 44004*) a single static safety factor requirement of 1.5 and a seismic safety factor requirement of 1.2 for all impoundments.

Challengers to the 1983 rule in *In re Permanent II* (Round III) contended that OSMRE's 1982 proposed rule had not included a static safety factor of 1.5 for small impoundments, and therefore the public was not given adequate notice that this requirement would apply to small sedimentation ponds. The court remanded this rule for additional rulemaking to the extent that it applied to small sedimentation ponds not previously required to meet the 1.5 static safety factor. (*620 F. Supp. at 1568-1570.*) Accordingly, on November 20, 1986 (*51 FR 41958*), OSMRE suspended Section 816.49(a)(3) insofar as it applied to small sedimentation ponds. OSMRE proposed revisions to Section 816.49(a)(3) on October 21, 1987 (*52 FR 39364*).

#### **4. FOUNDATIONS**

The 1983 rule (*48 FR 44004*) in Section 816.49(a)(5)(i) required that foundations and abutments for impounding structures be designed to be stable under all conditions of construction and operation. Section 816.49(a)(5)(i) also required sufficient foundation investigation and laboratory testing to determine design requirements for foundation stability for all impoundments, regardless of size. That provision was challenged in *In re Permanent II (Round III)* on the basis that the rule violated the Administrative Procedure Act because the requirements for foundation investigation and laboratory testing were not included for small sedimentation ponds when OSMRE proposed the rule on June 21, 1982 (*47 FR 26759*).

The court remanded Section 816.49(a)(5)(i), rejecting the application of foundation investigation and laboratory testing to small ponds because there was insufficient notice in the proposed rule that these requirements were being applied to small ponds. (*620 F. Supp. at 1568-1570*.) On November 20, 1986 (*51 FR 41958*), in response to the court action, OSMRE suspended Section 816.49(a)(5)(i) insofar as it applied to small sedimentation ponds. OSMRE proposed revisions to Section 816.49(a)(5)(i) on October 21, 1987 (*52 FR 39364*).

#### **5. CERTIFICATION OF SILTATION STRUCTURES**

An October 30, 1986, amendment to the Act authorized land surveyors to certify the construction of siltation structures. (Section 123, Pub. L. 99-591, 100 Stat. 3341-267.) The certification requirement of section 515(b)(10)(B)(ii) of the Act was amended by inserting after "qualified registered engineer" the phrase, "or a qualified registered professional land surveyor in any State which authorizes land surveyors to prepare and certify such maps or plans." Prior to this amendment, section 515(b)(10)(B)(ii) required that siltation structures be certified only by a qualified registered engineer. Consistent with this amendment, OSMRE proposed revisions to Section 816.46(b)(3) on October 21, 1987 (*52 FR 39364*).

#### **6. INSPECTION OF IMPOUNDMENTS**

The 1979 impoundment regulations at Section 816.49(h) (*44 FR 15402*) authorized land surveyors to perform and certify the annual inspection of small impoundments except for coal processing waste dams and embankments. During the preparation of the 1983 rule (*48 FR 44004*) OSMRE inadvertently omitted this provision from Section 816.49. The fact that the provision was missing was not noticed until OSMRE promulgated a final rule on April 24, 1985 (*50 FR 16194*), to implement a November 4, 1983, amendment to the Act which authorized qualified land surveyors in certain States to certify cross sections, maps and plans.

Although neither the 1979 nor the 1983 rule included any comments on the merits of land surveyors doing the annual inspection of small impoundments, comments received during the preparation of the 1985 final rule supported land surveyors' capability to perform these inspections (*50 FR 16197*, April 24, 1985). OSMRE found the comments on this point to have merit and stated in the preamble to the 1985 rule that it would consider proposing a revision to Section 816.49(a)(10) to allow post-construction inspections of small impoundments by qualified land surveyors. However, OSMRE believed that it was inappropriate to include such a provision in the final 1985 rule because it had not been included in the proposed rule (*49 FR 38959*). OSMRE proposed the implementation of this provision in Section 816.49(a)(10) on October 21, 1987 (*52 FR 39364*).

## **II. DISCUSSION OF FINAL RULE AND COMMENTS**

After consideration of the administrative record of this rule, as well as the legislative history of the Act and the opinions of the District Court in *In re Permanent II (Round III)*, and in light of current technical information on impoundment design, construction and inspection, OSMRE is amending its permanent regulatory program. Consistent with its findings when promulgating the 1979 and 1983 rules, OSMRE has not identified any differences between impoundments for surface and underground mines that would necessitate different regulatory provisions for underground mines. Therefore, the permitting rules governing impoundments for surface mining activities at 30 CFR 780.25 and for underground mining activities at 30 CFR 784.16 are identical. Likewise, the rules for surface mining activities at 30 CFR 816.46, 816.49 and 816.84 are identical to the rules for underground mining activities at 30 CFR 817.46, 817.49 and 817.84, respectively. Thus, the following discussion of 30 CFR 780.25, 816.46, 816.49 and 816.84 also applies to 30 CFR 784.16, 817.46, 817.49 and 817.84, respectively.

In addition to the rule language revisions discussed in the remainder of this preamble, OSMRE has made minor editorial changes to improve the clarity of the rule. For instance, the plural nouns, "impoundments" and "sedimentation ponds," have been replaced with the singular "impoundment" and "sedimentation pond." This usage more clearly prescribes requirements applicable to each permitted structure.

## **GENERAL COMMENTS**

In addition to comments received on specific provisions of the October 21, 1987, proposed rule, OSMRE received several general comments. One commenter asserted that it appeared that OSMRE was again drafting rules with nationwide application but designed for conditions found in the eastern States; however, no specific examples were included in the comment. OSMRE should, the commenter maintained, redraft these rules to recognize regional differences and allow States to tailor their regulatory programs accordingly.

OSMRE is charged under SMCRA with establishing national permitting requirements and performance standards. In meeting this requirement, OSMRE has attempted to set such standards in a manner that is both uniform and flexible. However, during the analysis of this particular comment OSMRE was unable to identify any conditions at western mines that would be affected differently from similar conditions at eastern mines. Although minimum Federal requirements and standards must always be met, State regulatory authorities may incorporate local considerations into their programs, so long as all provisions of State programs are no less effective than the requirements of SMCRA and the Federal regulations.

Another commenter maintained that in numerous instances OSMRE failed to disclose the basis and technical justification for the proposed rule changes (specific instances are discussed subsequently with the relevant rule sections), and therefore the rule should be withdrawn pending sensitivity analyses of the impacts of proposed changes and disclosure of technical justifications, or the rulemaking record should be reopened for public comment after disclosure of such information.

OSMRE believes that the proposed and final preambles adequately discuss the basis for and the purpose of the rule. The impacts of the rule are addressed under the criteria of Executive Order 12291, the Regulatory Flexibility Act, and the National Environmental Policy Act of 1969, as summarized in III, "Procedural Matters."

OSMRE received a comment on the background discussion of the preamble to the proposed rule (*52 FR 39365*) concerning the 1983 renaming of Section 816.46 from "Hydrologic balance: Sedimentation ponds" to "Hydrologic balance: Siltation structures." OSMRE's reason for making this change, as the preamble to the proposed rule noted, was "to be consistent with the wording of section 515(b)(10)(B)(ii) of the Act and to reflect rule changes which provided for the use of certain siltation structures other than sedimentation ponds, such as chemical treatment facilities or mechanical structures that have a point-source discharge." (*52 FR 39365*.) The commenter suggested that this could leave the reader with the notion that some sort of siltation structure having point sources of discharge must be used to control sediment.

OSMRE did not intend to convey this notion, but was providing an example of suitable structures. OSMRE understands the commenter's concern, and has included a more accurate description of the rule in the background section of this preamble.

## **SECTIONS 780.25(c)/784.16(c) - PERMITTING REQUIREMENTS FOR PERMANENT AND TEMPORARY IMPOUNDMENTS**

Section 780.25(c) of OSMRE's permanent program regulations establishes permitting requirements applicable to the design of permanent and temporary impoundments. Final revisions to Section 780.25(c) are primarily organizational changes.

The first sentence of Section 780.25(c) of the 1983 rule, which read, "Permanent and temporary impoundments shall be designed to comply with the requirements of Section 816.49 of this chapter," has been retained as Section 780.25(c)(1) in this rule. Two commenters suggested identical revisions to the language of this paragraph so that it would read like a permitting requirement rather than a performance standard. They suggested that the sentence read, "Each permit application shall include design plans for each permanent and temporary impoundment demonstrating

compliance with the requirements of Section 816.49 of this chapter." Although OSMRE recognizes the basis for this suggestion, this change was not made in the final rule. Existing rule language at Section 780.25(a) adequately introduces all the requirements of Section 780.25 in a permitting context so that changes to the other paragraphs of Section 780.25 are unnecessary.

As proposed, this rule moves to Section 780.25(c)(2) the previous Section 816.49(a)(1) requirement that a copy of the plan submitted to the District Manager of MSHA under 30 CFR 77.216 also be submitted to the regulatory authority as part of the permit application. This requirement was moved because it is more closely related to the permitting provisions of Part 780 than to the performance standards of Part 816.

The first sentence of Section 780.25(c)(2) was revised, as suggested by three commenters, by adding the phrase "meeting the size or other criteria of the Mine Safety and Health Administration" to indicate that MSHA requires review only of plans for those impoundments that meet the criteria of 30 CFR 77.216(a). This is a more accurate reference to the requirement which applies only to impoundments meeting the MSHA criteria.

Two commenters maintained that language for sedimentation ponds in Section 780.25(b), a section not included in the proposed rule, presents the same problem as described above in that it requires that each plan comply with MSHA's requirements. The above change to Section 780.25(c)(2) of the final rule makes it clear that OSMRE requires that only impoundments meeting MSHA criteria meet MSHA requirements and is adequate to address the commenters' concern with Section 780.25(b).

The second sentence of Section 780.25(c)(2) has been revised at the suggestion of a commenter to be consistent with OSMRE's existing rules at Section 780.25(a)(1)(v), which allow for the submittal of detailed design plans after the submittal of the permit application. OSMRE has added the phrase, "in accordance with paragraph (a) of this section", to the second sentence of Section 780.25(c)(2). This clarifies that detailed design plans can be submitted to the regulatory authority in accordance with the schedule in the general plan.

One commenter suggested that OSMRE revise Section 780.25(c)(2) to replace the requirement to submit to the regulatory authority the plan required by MSHA with a requirement to submit to the regulatory authority "documentation proving that this plan was approved by MSHA". The commenter cited the burden placed on operators because of the large volume of paper included in a MSHA submittal and the sizeable number of copies of such plans required by the regulatory authority. The commenter further noted that operators cannot be certain which information in the submittal is relevant to MSHA's needs and which is necessary under SMCRA and that some of the information is sent to the regulatory authority merely because it was sent to MSHA and not because it is necessary for the review under SMCRA.

The proposal to submit to the regulatory authority a certification of MSHA's approval in lieu of the plan required for MSHA's review is unacceptable. MSHA's approval does not constitute approval under SMCRA. MSHA's mandate to provide for the safety of miners warrants considerations in their review different from those of OSMRE under SMCRA, particularly with respect to public safety and environmental effects.

OSMRE considered whether or not the removal of the requirement to submit the plan required by MSHA to the regulatory authority would reduce the paperwork requirements of this provision. OSMRE does not believe that this would accomplish a reduction in the burden on applicants. Although OSMRE's information needs under SMCRA are not identical to those of MSHA, particularly in respect to OSMRE's reclamation plan requirements, the design and construction information included in the plan submitted to MSHA does satisfy to a great extent OSMRE's needs for design and construction information. Removing this requirement would necessitate the preparation by the applicant of detailed design and construction documentation for OSMRE that, although possibly different in minor respects, would essentially be duplicative of the information prepared for MSHA. Further, because the design and construction information needs of both agencies are very similar, there would be little to be gained by having the applicant separate out the information necessary for review by OSMRE from that necessary for review by MSHA. In addition, the requirement to submit the entire MSHA documentation to the regulatory authority accomplishes the goal of having to the extent possible uniform requirements from agency to agency and from statute to statute.

This same commenter maintained that this requirement serves no useful purpose because the information necessary for review under SMCRA that is found in the plan required by MSHA is already required elsewhere in the SMCRA permit.

OSMRE disagrees. Consideration of the plan required to be submitted to MSHA is an integral part of the review of the design and construction of an impoundment because of the level of specificity that it provides. The requirement is included precisely because it satisfies a documentation need not covered elsewhere in regulations. To the extent that the information included in the plan also meets other requirements of OSMRE's regulations, for example the general requirement applicable to impoundments in Section 780.25(a)(1)(ii) to submit "a description, map, and cross section of the structure", OSMRE considers such other related requirements will have been met.

The final rule at Section 780.25(c)(3) allows the regulatory authority to establish engineering design standards in lieu of engineering tests for small impoundments located where impoundment failure would not be expected to cause loss of life or serious property damage. The design standards, which will be implemented through the State program approval process, will ensure stability comparable to the minimum static safety factor of 1.3 for small impoundments that is specified in Section 816.49(a)(3)(ii). OSMRE approval of any design standards issued by the regulatory authority will be based on the adequacy of those standards to ensure achievement of that minimum static safety factor.

This approach provides for the promulgation of a national standard based on a 1.3 safety factor (see discussion of Section 816.49(a)(3)(ii) for more detail) while giving the regulatory authority flexibility to establish engineering design standards to accommodate local conditions. Under this provision, a regulatory authority can establish specific embankment slopes, minimum freeboard requirements, etc., as long as minimum stability is achieved. The proposed language of Section 780.25(c)(3) was slightly revised in the final rule to clarify that engineering design standards will be acceptable only if they "ensure stability comparable to a 1.3 minimum static safety factor."

OSMRE received four comments supporting this change. One commenter suggested the OSMRE adopt the design criteria for small impoundments found in U.S. Soil Conservation Service (SCS) Pond: Practice Standard 378, 1985 (SCS Practice Standard 378), and thereby meet the requirement in section 515(b)(8)(B) of SMCRA that permanent water impoundments be compatible with structures constructed under Pub. L. 83-566 (see the discussion of Section 816.49(a)(1) for more information on this compatibility requirement). Adopting these criteria, the commenter believed, would take advantage of the SCS's considerable experience in the design and construction of impoundments, while not placing an undue burden on coal mine operators.

The requirement that small impoundments comply with SCS design criteria was included in OSMRE's original permanent program regulations (*44 FR 15401*; March 13, 1979), but was later removed to "allow appropriate professionals the latitude necessary for application of technological advances and innovative techniques as well as of updated design guides." (*47 FR 26756*; June 21, 1982). Although, in most cases, OSMRE considers the SCS criteria for small impoundments adequate in lieu of engineering tests to show compliance with the 1.3 safety factor, and encourages regulatory authorities to consider adoption of such criteria, it would be inappropriate to incorporate the SCS criteria into these regulations. To do so would unnecessarily restrict the ability of States to adopt or establish design standards that are as adequate as the SCS criteria, though not identical in all respects. In States that have had adequate design criteria in place for years, such a requirement would mean overhauling an otherwise acceptable system without any improvement in environmental protection.

#### SECTIONS 816.46(b)(3)/817.46(b)(3) - CERTIFICATION OF SILTATION STRUCTURES

In response to an October 30, 1986, amendment to the Act (see 5. Certification of siltation structures in "Background"), OSMRE is amending Section 816.46(b)(3) to authorize land surveyors in certain States to certify the construction of siltation structures before they are placed in operation. Prior to the amendment, the Act authorized only qualified registration engineers to certify siltation structures. This new provision, which was supported by one commenter, authorizes the certification of siltation structures by a qualified registered professional land surveyor in any State which authorizes land surveyors to prepare and certify cross sections, maps, and plans in accordance with Section 780.25.

#### SECTIONS 816.46(c)(2)/817.46(c)(2) - SEDIMENTATION POND SPILLWAYS

Because the spillway requirements for sedimentation ponds are based on the spillway design requirements for permanent and temporary impoundments in Section 816.49, final changes in Section 816.49 (a)(8) and (c)(2) necessitate changes in Section 816.46(c)(2) to ensure consistency. Comments received by OSMRE addressed the spillway

requirements as they apply to both sections. The similar provisions in these two sections, the comments and OSMRE's responses, which are applicable to all impoundments, including sedimentation ponds, are addressed later in the discussion of Section 816.49 (a)(8) and (c)(2) under four headings: Single Spillway Provision, Spillway Linings, Design Precipitation Events, and Storage Control. The following discussion summarizes the final changes in Section 816.46(c)(2).

Final Section 816.46(c)(2) has been restructured, and language prescribing single spillway configuration requirements has been added in paragraphs (i) (A) and (B). The reasons for this restructuring and for further specifying the spillway provisions are addressed in the discussion of comments for Section 816.49 (a)(8) and (c)(2) concerning impoundments.

Under Section 816.46(c)(2), a sedimentation pond spillway or spillways must have sufficient capacity to safely pass the specified precipitation event. A single spillway is sufficient for a large or small sedimentation pond as long as it passes the specified precipitation event.

Section 816.46(c)(2) changes the provision in Section 816.46(c)(2)(ii) of the 1983 rule, which specified that ponds "may use a single spillway if the spillway (A) is an open-channel of nonerodible construction and capable of maintaining sustained flows; and (B) is not earth- or grass-lined." OSMRE is allowing a single open-channel spillway as long as the specified design precipitation event can be accommodated. However, language has been added at final Section 816.46(c)(2)(i) that limits the type of single spillway configurations that may be approved by the regulatory authority. Paragraph (c)(2)(i)(A) authorizes a single open-channel spillway of nonerodible construction and designed to carry sustained flows. Paragraph (c)(2)(i)(B) authorizes a single earth- or grass-lined spillway designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected. The discussion of Section 816.49(a)(8) addresses the rationale for these additions, as well as relevant comments.

The rule includes at Section 816.46(c)(2)(iii) a provision, applicable to temporary structures, authorizing the regulatory authority to approve the design of a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event in lieu of meeting the spillway requirements at Section 816.46(c)(2)(i). The rule stipulates that this will be allowed when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor in accordance with Section 780.25(a) that the sedimentation pond will safely control the design precipitation event, the water from which will be safely removed in accordance with current, prudent, engineering practices. The regulatory authority may approve such a sedimentation pond if it is located where failure would not be expected to cause loss of life or serious property damage, except where (1) in the case of a sedimentation pond meeting MSHA criteria, the pond is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or (2) in the case of a sedimentation pond not meeting MSHA criteria, the pond is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

OSMRE has replaced the sentence "in the absence of an adequate, or any, spillway" which appeared in the proposed rule, with "in lieu of meeting the requirements in paragraph (c)(2)(i) of this section." Paragraph (c)(2)(i) authorizes the regulatory authority to approve a single spillway only when it is an open-channel spillway. OSMRE believes that a closed-conduit type spillway alone will not adequately pass the design precipitation event without a considerable reliance on storage. In the absence of having a combination of principal and emergency spillways or a single open-channel spillway meeting the requirements of Section 816.46(c)(2)(i), a sedimentation pond would have to meet the requirements for structures relying primarily on storage in Section 816.46(c)(2)(iii).

OSMRE believes that the provision allowing sedimentation ponds that rely primarily on storage will be useful for those sedimentation ponds where the runoff area is small, or where pumps or a decant structure will be used to control the water level in the facility. OSMRE believes that current, prudent, engineering practice requires that at least 90 percent of the water stored during the design precipitation event be removed within the 10-day period following the event.

Section 816.46(c)(2)(ii)(A) requires that large sedimentation ponds, those meeting the size or other qualifying criteria of 30 CFR 77.216(a), shall have sufficient spillway capacity to safely pass a 100-year 6-hour precipitation event, or greater event as specified by the regulatory authority.

Section 816.46(c)(2)(ii)(B) requires that small sedimentation ponds, those not meeting the size or other qualifying criteria of 30 CFR 77.216(a), shall have sufficient spillway capacity to safely pass a 25-year 6-hour precipitation event, or greater event as specified by the regulatory authority. In both cases, the 6-hour precipitation event is the same as in the 1983 rule.

Although these two provisions were proposed as paragraphs (c)(2)(i) and (c)(2)(ii), respectively, because of a restructuring of final Section 816.46(c)(2), they are relocated without additional change to paragraphs (c)(2)(ii)(A) and (c)(2)(ii)(B), respectively, of the final rule.

#### SECTIONS 816.49(a)(1)/817.49(a)(1) - IMPOUNDMENT SIZE DISTINCTION

Section 515(b)(8)(B) of the Act requires that "permanent impoundment dam construction will be so designed as to achieve necessary stability with an adequate margin of safety compatible with that of structures constructed under Pub. L. 83-566 (*16 U.S.C. 1006*)." Public Law 83-566, the Watershed Protection and Flood Prevention Act of 1954, authorizes the planning and construction of Federal water control facilities. In implementing Pub. L. 83-566, the U.S. Soil Conservation Service (SCS) has established criteria for the design and construction of impoundments. The SCS criteria divide impounding structures into two categories based on size and potential hazard. Larger and/or potentially more hazardous impoundments must meet the more stringent design and construction requirements of SCS Technical Release 60, while smaller and less hazardous impoundments must meet the less stringent requirements of SCS Practice Standard 378.

Under the size criteria adopted by the SCS, dams over 35 feet high and those with a product (storage times the height of the dam) of 3000 or more are subject to the more stringent requirements of SCS Technical Release 60. In addition, all dams, regardless of their size, located "where failure may cause loss of life, serious damage to homes, industrial and commercial buildings, important public utilities, main highways, or railroads," and dams located "in predominantly rural or agricultural areas where failure may damage isolated homes, main highways or minor railroads or cause interruption of use or service of relatively important public utilities" are subject to the requirements of SCS Technical Release 60. Thus, in implementing Pub. L. 83-566 the SCS has adopted more stringent design and construction requirements for impoundments that exceed a specified size, as well as for those where failure may cause loss of life or serious property damage.

The regulations of the Mine Safety and Health Administration (MSHA) also reflect the engineering consensus that larger impoundments present a greater potential downstream hazard than do smaller impoundments. Thus, MSHA regulates impoundments which "can: (1) Impound water, sediment or slurry to an elevation of five feet or more above the upstream toe of the structure and can have a storage volume of 20 acre-feet or more; or (2) impound water, sediment or slurry to an elevation of 20 feet or more above the upstream toe of the structure; or (3) as determined by the District Manager, present a hazard to coal miners." (30 CFR 77.216(a)).

In implementing the requirements of section 515(b)(8)(B) of SMCRA, OSMRE could have adopted the SCS criteria, and thus ensured that "impoundment dam construction will be so designed as to achieve necessary stability with an adequate margin of safety compatible with that of structures constructed under Pub. L. 83-566." Further, OSMRE could have restricted application of the criteria to permanent impoundments, as section 515(b)(8)(B) does not apply to temporary impoundments. However, in view of this broader mandate of section 102(a) of the Act "to protect society and the environment," OSMRE has adopted a rule that is based on the size and hazard distinctions established by the SCS, yet incorporates this more stringent MSHA criteria. In addition, this rule applies to temporary, as well as permanent, impoundments, thus ensuring that more impoundments meet these more stringent standards than is required by section 515(b)(8)(B).

First, Section 816.49(a)(1) applies the MSHA criteria, including the MSHA size distinction, is differentiating between impoundments. Impoundments meeting the MSHA criteria are automatically subject to both the more stringent standards of OSMRE's rules (see discussion of Section 816.49(a)(3), Stability) and the MSHA regulations at 30 CFR 77.216 to 77.216-5. By adopting the MSHA criteria at 30 CFR 77.216(a), Section 816.49 subjects all impoundments 20 feet high or more, as well as those impounding 20 acre-feet or more, to its more stringent stability requirements. Compared to the SCS threshold of 35 feet in height, OSMRE's threshold of 20 feet in height will subject more dams to the greater stability requirements of this rule than would otherwise be the case if OSMRE simply adopted the SCS criteria to satisfy the minimum requirements of section 515(b)(8)(B) of the Act.

Second, OSMRE has included language in the rule to ensure that impoundments which do not meet the MSHA criteria, but are "located where failure would be expected to cause loss of life or serious property damage," are also subject to the more stringent stability requirements. OSMRE interprets the phrase "loss of life or serious property damage" to mean loss or damage of the same magnitude as recognized by the SCS in applying its standards (see above).

In addition to providing a high level of protection to society and the environment for large and/or potentially more hazardous impoundments, this rule includes reasonably stringent stability requirements for smaller and potentially less hazardous impoundments, and thus provides an appropriate degree of environmental protection for every structure.

Beyond meeting the mandates of sections 102(a) and 515(b)(8)(B) of the Act, the criteria chosen by OSMRE reflect the direction given to OSMRE by section 201(c)(12) of the Act to cooperate with other Federal agencies to minimize duplication of inspection, enforcement, and administration of the Act. Although acting under a different legal authority from OSMRE, MSHA carries out many similar inspection and enforcement responsibilities. By incorporating MSHA's criteria into this rule, OSMRE is enhancing regulatory consistency between the two agencies.

This combined consideration of potential impoundment hazard based on the locational standards employed by the SCS, along with the more stringent MSHA size distinctions, is fully consistent with the stability and safety requirements of section 515(b)(8)(B) of the Act. Moreover, it accomplishes a level of regulatory uniformity with MSHA that is consistent with section 201(c)(12) of the Act while meeting the mandate of section 201(a) of the Act to protect "society and the environment" beyond the MSHA criteria, which derive from the Federal Coal Mine Health and Safety Act's narrower mandate to protect the health and safety of miners.

SCS Practice Standard 378 and SCS Technical Release 60 have been entered in the OSMRE Administrative Record for this rule.

In addition to incorporating the size and hazard criteria described above, OSMRE has made two minor organizational changes in the rule. OSMRE has reorganized Sections 780.25(c) and 816.49(a)(1) to clarify impoundment size distinctions relative to permitting and to performance standards, respectively. The first sentence in final Section 816.49(a)(1) is the same as in the 1983 rule, except that the phrase "size or other" is inserted before "criteria" to be consistent with other provisions of the rule.

OSMRE has relocated from Section 816.49(a)(1) of the 1983 rule to Section 780.25(c)(2) the provision requiring that a copy of the plan submitted to the District Manager of MSHA under 30 CFR 77.216 also be submitted to the regulatory authority as part of the permit application. This sentence was relocated because it is a permitting provision rather than a performance standard.

OSMRE received four comments on the adoption of the MSHA criteria, three supportive, one in opposition. The three supporting commenters essentially based their support on the fact that it would be beneficial for OSMRE and MSHA to have a uniform size classification.

One of the supporting commenters acknowledged that evaluating impoundments based on size and hazard is generally accepted and appropriate because larger structures can be expected to present more of a danger to life and property and require more care in design and construction than small impoundments. The commenter added that the MSHA classification increases protection because it results in the application of a more stringent standard to more structures than would be covered under other criteria, including the SCS guidelines. Further, the commenter pointed out, consistent classification systems by agencies regulating impoundments have proved beneficial by minimizing conflicting requirements and this improving the quality of construction and maintenance of structures.

The other two commenters supporting OSMRE's adoption of MSHA criteria conceded that although it is the most stringent of the criteria discussed by OSMRE in the October 21, 1987, preamble to the proposed rule, it is beneficial to operators because they are, generally, complying with MSHA criteria already, and the use of the same criteria will avoid burdening operators with an additional standard.

One commenter objected to the adoption of the MSHA criteria, suggesting that it would result in the application of stability, construction and inspection requirements for small impoundments below those necessary to assure the protection intended to be afforded by SMCRA. The commenter further maintained that OSMRE failed to take into account the requirement in section 515(b)(8) of SMCRA that all impoundments, without regard to size or storage volume, be designed, constructed and maintained so as to assure that they will achieve necessary stability with an adequate margin of safety compatible with that of structures constructed under Pub. L. 83-566. The commenter further suggested that OSMRE's evaluation of impoundments would allow small impoundments to be approved absent sufficient safeguards.

Although the requirement in section 515(b)(8)(B) of SMCRA neither suggests nor precludes the adoption of a size distinction, it does require that permanent impoundments be constructed to achieve stability and a margin of safety "compatible with that of structures constructed under Pub. L. 83-566." As discussed previously, the SCS employs a size distinction in building impoundments under Pub. L. 83-566, whereby smaller, potentially less hazardous dams are subject to less stringent design and construction requirements. In addition to adopting more stringent criteria for differentiating between impoundments than that established by the SCS under Pub. L. 83-566, OSMRE has applied reasonably stringent stability criteria to smaller impoundments to the extent that they will not be approved absent sufficient safeguards (see discussion of Section 816.49(a)(3) Stability).

This same commenter claimed that OSMRE's reliance on the SCS guidelines and the Federal Guidelines for Dam Safety (the latter document was cited by OSMRE in the preamble to the proposed rule as an example of a Federal document employing a size distinction) to support adoption of the MSHA criteria is misplaced. Although the commenter did not attempt to refute the assertion in the Guidelines that larger impoundments generally created a greater risk in terms of the potential for loss of life and serious property damage, the commenter maintained that the Guidelines set forth a definition of "dam" which applied to all structures in which there is a potentially significant downstream hazard. Specifically, the commenter continued, although the definition identified dams as artificial barriers which either were 25 feet or more in height measured at the downstream toe, or had impoundment capacity of 50 acre-feet or more, its lower-end exclusion applied only to structures of less than six feet in height or which impounded less than 15 acre-feet of storage volume, less than the 20 acre-feet threshold under MSHA criteria. Because of this very limited exclusion, the commenter suggested, the Guidelines definition is, depending on the natural ground slope, potentially more or less inclusive than the MSHA classification. And even this lower-end exclusion, the commenter added, could be waived if a structure presented a downstream hazard.

It is because of OSMRE's concern about the potential downstream hazards of small impoundments that these rules include the qualifying phrase "or located where failure would be expected to cause loss of life or serious property damage." Thus, the regulatory authority shall apply the more stringent performance standards to a small impoundment if its failure would be expected to cause loss of life or serious property damage. Thus, the commenter's concern about how inclusive the MSHA criteria are, relative to those in the Guidelines, will be met by the ability of regulatory authorities to apply more stringent requirements where necessary due to the location of the dam.

The commenter also maintained that the Federal Guidelines for Dam Safety were not intended as guidelines or standards for the technology of dams, but were developed to establish basic principles applicable to all dams. In addition, the commenter pointed out, they were developed as part of a review of national policy for thousands of major structures creating potential risks comparable to those of the earthen embankment Teton Dam in Idaho, which failed in 1976. Although, the commenter conceded, the failure of an impoundment below the MSHA standards might be of little consequence in a national context, OSMRE's responsibility under SMCRA to protect the environment still stands. The real message of the Guidelines, the commenter maintained, is that if OSMRE pursues a differential classification, the criteria must ensure a minimum level of safety regardless of structure size or volume.

As mentioned before, the rule provides a reasonable minimum level of safety for all impoundments. And, as noted in the discussion of Section 816.49(a)(3) Stability, OSMRE's minimum requirements for all dams, regardless of size or potential hazard, are appropriately stringent in light of SMCRA's requirement to protect the environment.

This same commenter was puzzled by OSMRE's reliance on the SCS guidelines as support for differential classification, because the SCS guidelines, unlike MSHA's and OSMRE's regulations, include numerous design and performance standards for small impoundments, including specifications for minimum top width, slope controls, minimum freeboard, side slope configurations, inlet protection, spillways, and other standards. The commenter pointed

out that if the SCS, acting under the authorization of Pub. L. 83-566, deemed it necessary to establish such design and performance standards, why does OSMRE consider the same unnecessary in implementing section 515(b)(8)(B) of SMCRA. The commenter asked OSMRE to justify how the adoption of size distinctions, absent design and construction standards commensurate with those of the SCS, would provide for the stability and adequate margin of safety that the SCS has accomplished under Pub. L. 83-566.

OSMRE recognizes that safety requirements can be approached from either the perspective of establishing design standards or by setting minimum safety factors. Although the SCS has adopted design standards and minimum safety factors in the technical manual, OSMRE believes that the adoption of safety factors provides desirable flexibility in the design of impoundments. OSMRE believes that instead of restricting qualified professionals in the design of impoundments, the adoption of safety factors provide equivalent protection and allows them to employ more flexible design standards in designing safe and stable impoundments. OSMRE believes that the adoption of the equivalent minimum safety factor requirements in this rule provides for the construction of impoundments with an adequate level of safety compatible with that achieved in the construction of impoundments by the SCS (see discussion of Stability for technical basis for choice of required safety factors).

This same commenter maintained that the MSHA classification itself is inadequate to satisfy safety concerns. The commenter cited a disaster involving a structure on the Left Fork of the Ages Creek in Ages, Kentucky, that was built in lifts which did not individually meet the criteria of 30 CFR 77.216 but which impounded a total amount of water far in excess of the criteria. The loss of a life and destruction of homes in this instance, in derogation of congressional intent under SMCRA, the commenter asserted, can be attributed to this "loophole" in the MSHA classification.

The Ages Creek structure failed because of compliance problems rather than the lack of governing regulations. The structure, which was permitted by MSHA as a refuse pile rather than as an impoundment, failed due to the large quantity of water entrapped within the pile in violation of MSHA's 30 CFR 77.215(e) and OSMRE's 30 CFR 816.83(a).

Furthermore, OSMRE includes in these new impoundment regulations a provision which addresses the commenter's concern about a "loophole" in the MSHA classification. Under Section 816.49(a)(3), a series of small structures which individually do not meet the criteria of 30 CFR 77.216 would still be subject to the more stringent stability requirements for large impoundments if structural failure would be expected to cause loss of life or serious property damage. In such a case, it is the potential downstream hazard that dictates which stability standard applies, not the size of each structure.

And, finally, the Ages structure was built of coal mine waste. Under 30 CFR 816.81(c)(2), all coal mine waste structures permitted by OSMRE, including refuse piles and impounding structures, must meet the more stringent long-term safety factor of 1.5, regardless of size.

The final point made by this commenter was that OSMRE's effort to maintain regulatory consistency with MSHA is a fundamental distortion and misunderstanding of its congressional mandate. The commenter disputed OSMRE's assertion in the October 21, 1987, preamble (*52 FR 39368*) that SMCRA warrants consistency between the regulations of OSMRE and MSHA.

The commenter cited the passage of SMCRA in the wake of the Buffalo Creek, West Virginia, disaster of 1972 and the awareness by Congress that regulations issued under the Federal Coal Mine Health and Safety Act of 1969 were insufficient to provide for the protection of the public-at-large and the environment. The commenter reminded OSMRE that its responsibilities under SMCRA do not duplicate MSHA's responsibilities under the 1969 Act, but are supplementary to them. Whereas MSHA's responsibility is to the safety of miner's on-site, SMCRA goes beyond that by addressing the safety of the public, both on and off the minesite. The commenter suggested that OSMRE tacitly acknowledged this in adopting an "escape clause" which allows more stringent treatment of small impoundments where failure would be expected to cause loss of life or serious property damage. However, the commenter added, this "escape clause" is much too narrow in light of the fact that it only addresses "life and serious property damage," whereas SMCRA mandates consideration of risk of damage to the environment as well. In failing to go beyond MSHA's standards, the commenter maintained, OSMRE must independently justify, and allow public comment on such justification, that the numeric size and volumetric limitations adopted by MSHA are scientifically and technically sound and supported in the literature and remain so despite the fact that the MSHA standards were adopted in 1975.

In sum, the commenter suggested that in order to independently justify the criteria used by MSHA on technical bases, and to further demonstrate how the rule provides a degree of assurance of stability with a margin of safety commensurate with Pub. L. 83-566 and guidelines adopted thereunder, OSMRE should conduct investigations and comparisons and renote the rule.

Prudence dictates, the commenter concluded, that assurance of protection of the public and the environment should be provided by the most rigorous and most protective technical standards currently in general use, not by blind deference to an agency whose mandate is not protection of the general public and the environment, and whose regulations have already proven fatally inadequate to the task.

OSMRE does not dispute this commenter's interpretation that SMCRA goes beyond the Federal Coal Mine Health and Safety Act. That is why OSMRE has included in its regulations a provision for considering the potential for loss of life or serious property damage in determining the potential hazard of an impoundment. OSMRE is not deferring to MSHA on questions of impoundment hazards, but is adopting under SMCRA what it believes to be a reasonable basis for differentiating between larger, more hazardous impoundments and smaller, less hazardous ones. In addition to incorporating the size distinction and the consideration of the potential hazard to miners under MSHA's rules at 30 CFR 77.216(a)(3), OSMRE has included in this rule consideration of the potential hazard of an impoundment to the public-at-large. An impoundment that is not large enough to meet the MSHA criteria, and not otherwise hazardous to miners, would not be subject to MSHA's review. However, such an impoundment would be subject to the more stringent stability and safety requirements of OSMRE's rules if its failure would be expected to cause loss of life or serious property damage. Thus, OSMRE has established a hazard evaluation based on SMCRA's mandate to protect society and the environment, and, contrary to the commenter's assertion, has gone beyond the MSHA standards for regulating impoundments.

The commenter raised the point that OSMRE's provision for considering the potential loss of life or serious property damage is deficient in not including similar consideration of the hazard to the environment. OSMRE does not deny the importance of the mandate under SMCRA to protect the environment, as well as society. The establishment in these rules of stringent safety and stability standards for all impoundments provides considerable environmental protection. By establishing performance standards for all small impoundments, OSMRE has established a level of environmental protection for such impoundments and the areas potentially affected by them that does not exist elsewhere in Federal regulations. At the same time, when considering the potential destruction resulting from an impoundment failure, OSMRE believes it is reasonable to place the highest priority on the protection of downstream populations. OSMRE believes that the provisions included in this rule are a reasonable response to the urgent need to protect lives and property and SMCRA's mandate to protect the environment.

Finally, concerning the commenter's assertion that OSMRE has not technically justified its incorporation of the MSHA criteria, OSMRE points to section 515(b)(8)(B) of SMCRA which requires that impoundments be as stable and safe as those constructed under Pub. L. 83-566 (i.e., built by the SCS). Since the requirements of this rule are more stringent than for impoundments built by the SCS, it stands to reason that they must meet the level expected by the Congress under section 515(b)(8)(B) of SMCRA. In addition, OSMRE has technically justified its choice of minimum safety factors (see discussion of Section 816.49(a)(3) Stability) for all categories of impoundments.

#### SECTIONS 816.49(a)(3)/817.49(a)(3) - STABILITY

Section 816.49(a)(3)(i) requires impoundments meeting the size or other criteria of 30 CFR 77.216(a) or located where failure would be expected to cause loss of life or serious property damage to have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2 (see 3. Stability in "Background"). The phrase "located where failure would be expected to cause loss of life or serious property damage" differs from the proposed phrase, "located where failure may cause loss of life or serious property damage." OSMRE believes that the phrase "would be expected" provides a more reasonable test than the term "may" in considering the likelihood of the occurrence of loss of life or serious property damage. With this change, this provision is consistent with similar references in the permitting provisions at Section 780.25(c)(3) and the spillway provisions at Section 816.49(a)(8)(i)(D).

For impoundments not meeting the size or other criteria of 30 CFR 77.216(a), except coal mine waste impounding structures, and located where failure would not be expected to cause loss of life or serious property damage, Section

816.49(a)(3)(ii) requires a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions or compliance with the requirements of Section 780.25(c)(3). The phrase "located where failure would not be expected to cause loss of life or serious property damage" differs from the proposed phrase, "not located where failure may cause loss of life or serious property damage," for the same reasons discussed relative to the parallel change in paragraph (a)(3)(i) above.

OSMRE selected the 1.3 safety factor for non-hazardous small impoundments based on the U.S. Mining Enforcement and Safety Administration's Engineering and Design Manual -- Coal Refuse Disposal Facilities (Prepared by D'Appolonia Consulting Engineers, Inc., Pittsburgh, Pa., 1975). The manual suggests a 1.3 safety factor for new coal refuse embankments that have a low hazard potential (p. 5.144). These are structures located in rural or agricultural areas where failure would cause only slight damage to structures such as farm buildings, forests or agricultural land, or minor roads. Because coal refuse impounding structures are, generally, of greater concern from a hazard standpoint than other impoundments, and because the manual considers the 1.3 safety factor to be adequate for coal refuse impounding structures that have a low hazard potential, OSMRE believes that this is a reasonable safety factor for other impoundments with low hazard potential. However, because of OSMRE's concerns relative to the safety of coal mine waste impounding structures, Section 816.81(c)(2) requires all such structures to meet a minimum static safety factor of 1.5.

In addition, under Section 816.49(a)(3) an impoundment, irrespective of size, is subject to the more stringent stability requirements specified in Section 816.49(a)(3) if the regulatory authority determines that it is located where failure would be expected to cause loss of life or serious property damage. This additional safeguard links the criteria for determining if an impoundment is potentially hazardous directly to the purpose stated in section 102(a) of SMCRA to protect society and the environment from the adverse effects of surface coal mining operations. By requiring the regulatory authority to ensure that a small impoundment meets the more stringent stability standards for large impoundments where failure would be expected to cause loss of life or serious property damage, the provision covers those potentially hazardous small impoundments that may not be hazardous to miners under MSHA criteria, but may pose a threat to other populations or property.

All of the comments received by OSMRE concerning this provision addressed the stability requirements for small impoundments in Section 816.49(a)(3)(ii). One commenter suggested that requiring small impoundments to meet a minimum safety factor of 1.3 is unnecessary because of the slight hazard potential of such structures. The commenter stated that stability of these embankments depends on proper construction and maintenance practices more than a mathematical analysis. Due to the size of small impoundments, the commenter added, it is often difficult to perform a sufficient number of checks of possible failure surfaces and thus accurately estimate the minimum safety factor. Such calculated safety factors, the commenter said, may lead to false indications of stability. The commenter suggested that, in the case of small impoundments, OSMRE replace this requirement with a requirement that embankments be stable under all conditions of construction and use.

In addition to reviewing MSHA's Engineering and Design Manual -- Coal Refuse Disposal Facilities, OSMRE reviewed SCS Design Guide 378, SCS Technical Release 60, and a soil mechanics text (Terzaghi and Peck, 1967) and found that these sources did not substantiate the commenter's assertion that an accurate minimum safety factor cannot be estimated for small embankments. The soil mechanics text (Ibid., page 259), in a discussion on sources of error in stability computations, listed three sources of error but did not reference computation problems in detecting deeper failures within the embankment. However, calculations are not necessary if design standards are established by the regulatory authority in accordance with Section 780.25(c)(3). Based on the consideration of this technical information and the option to employ design standards, OSMRE believes that the commenter's concern is adequately addressed. Thus, the 1.3 safety factor will continue to be applied to small impoundments.

Two other commenters suggested that the establishment of a national stability standard for small impoundments is unwarranted. The commenters further suggested that the 1.3 static safety factor should be applied to small impoundments only when failure would be expected to cause loss of life or serious property damage. In other situations, the commenters urged, it is sufficient to simply require that standard engineering practices be used. These commenters pointed out the SCS has not adopted a minimum safety factor for small impoundments under the authority of Pub. L. 83-566 and that ten years of experience with SMCRA has not indicated a need for such a standard. Rather than create an additional administrative burden on operators without effecting an added benefit to the public, the commenters maintained, OSMRE should adopt the design guidance found in SCS Practice Standard 378 to ensure the stability of small impoundments.

OSMRE believes that performance standards rather than design standards represent the preferred approach to regulating impoundment design and construction. Performance standards create minimum national standards that are more adaptable to variations in climate, geology, topography and other regional physical conditions.

OSMRE rejects the commenter's suggestion that the 1.3 static safety factor should apply only to small impoundments where failure would be expected to cause loss of life or serious property damage. As discussed earlier, OSMRE selected the 1.3 safety factor as an appropriate minimum standard necessary to ensure stability with a margin of safety that adequately considers potential environmental effects as required under SMCRA. Because of the necessity to ensure the most stringent stability requirements in cases where impoundment failure would be expected to cause loss of life or serious property damage, OSMRE retains the 1.5 static safety factor for all potentially hazardous impoundments. Furthermore, design standards that ensure stability comparable to a 1.3 safety factor may be established by the regulatory authority under Section 780.25(c)(3) in lieu of engineering tests.

One of these two commenters also argued that the requirement that a licensed professional certify the design and construction of small structures should provide assurance that good engineering practice will be applied and negate the need for the safety factor requirement. The same commenter also maintained that smaller impoundments will not receive less scrutiny during construction and inspection because the operators have a vested interest in ensuring that impoundments are stable, even if only to avoid the cost of rebuilding the structures, reclaiming the environment, and paying fines associated with the violations should they experience failures.

OSMRE considers it important to apply both the minimum safety factor requirement and the requirement that individuals certifying impoundment design and construction be licensed as professionally qualified. If either were dropped in deference to the other, it would increase the potential that impoundments would be inadequately designed or constructed.

Providing additional rationale for this position, this same commenter pointed out that in Ohio, the Department of Natural Resources, which regulates the design and construction of certain dams, does not regulate structures of a small size because of the low hazard potential. In fact, the commenter maintained, they frequently will exempt a larger dam from regulation if their review indicates the downstream hazard potential is low, while dams that are not exempted are subject to strict design standards and construction inspection and maintenance requirements. The commenter added that, in addition to Ohio, MSHA and the SCS do not have stability requirements. The commenter also noted that since the implementation of SMCRA in Indiana (May 3, 1978) there have been many hundreds of small ponds built in accordance with accepted design practices, and the commenter knew of no instance where a properly designed and built small impoundment caused any sort of problem whatsoever. This commenter summarized the position by suggesting that there is ample technical evidence that designing small impoundments according to certain non-analytical, predetermined standards is a common, standard, accepted and prudent engineering practice.

Again, consistent with OSMRE's position concerning design guides mentioned earlier, OSMRE acknowledges that designing and constructing impoundments in accordance with the SCS design guides will, generally, result in impoundments meeting the requirements of these regulations. OSMRE recognizes that safe structures can be built employing accepted and prudent engineering practice that conform to the performance standards of these regulations and that such practices can be a part of the regulatory program.

Finally, these two commenters and a third perceived an inconsistency between the language of Section 816.49(a)(3)(ii), which requires a 1.3 static safety factor, and Section 780.25(c)(3), which allows States to develop design standards that do not include safety factors. Commenters assumed that OSMRE's language in Section 780.25(c)(3) was intended to leave open the option for the regulatory authority to develop design standards in lieu of requiring demonstration of the 1.3 safety standard. A fourth commenter was more specific in this regard in suggesting that OSMRE revise the language to allow the regulatory authority the option of establishing engineering design standards for small impoundments through the State program approval process in lieu of engineering tests.

Section 780.25(c)(3) authorizes the regulatory authority to establish engineering design standards in lieu of requiring engineering tests to meet the required 1.3 static safety factor for small impoundments. Because Section 780.25(c)(3) was not cross-referenced in proposed Section 816.49(a)(3)(ii), that authority was not readily evident in the proposed rule. To correct this oversight, the final Section 816.49(a)(3)(ii) includes a cross-reference to Section 780.25(c)(3) to clarify that

small impoundments located where failure would not be expected to cause loss of life or serious property damage must either have a minimum static safety factor of 1.3 or, alternatively, meet design standards developed in accordance with Section 780.25(c)(3).

One commenter, in supporting the 1.3 static safety factor for non-hazardous impoundments as logical and sound engineering practice, noted that the rule would ensure an adequate level of safety for less hazardous impoundments while allowing engineers and, as applicable, land surveyors, the latitude to exercise professional judgment in determining how to best meet the required safety factor. In addition, this commenter pointed out, the regulatory authority has an opportunity to review the methods used in the determination of the safety factor when the detailed design plans are submitted as required by Section 780.25(a)(3).

One commenter suggested that Section 816.49(a)(3)(i) should read: "Impoundments meeting the size or other criteria of 77.216(a) of this title or other impoundments located where failure \* \* \* ." OSMRE believes that the final rule as originally written clearly indicates that impoundments must meet the 1.5 safety factor if they meet the criteria of 30 CFR 77.216 or if they are located where failure would be expected to cause loss of life or serious property damage. Thus, the suggested change has not been made.

A final commenter on this provision maintained that the requirement in SMCRA to protect the environment as well as life and property warrants application of the 1.5 safety factor to all impoundments regardless of size. OSMRE disagrees. As stated in the earlier discussion relative to size distinction, OSMRE believes that adequate environmental protection is ensured by applying the 1.3 static safety factor and the provisions in Section 816.49 to non-hazardous small impoundments.

#### SECTIONS 816.49(a)(5)(i)/817.49(a)(5)(i) - FOUNDATIONS

Final Section 816.49(a)(5)(i) requires that the foundation and abutments for impounding structures be stable during all phases of construction and operation, and be designed based on adequate and accurate information on the foundation conditions (see 4. Foundations in "Background"). The rule requires that for impoundments meeting the size or other criteria of 30 CFR 77.216(a) foundation investigation and any necessary laboratory testing of foundation material must be performed to determine the design requirements for foundation stability. The final rule does not prescribe any specific tests, but requires the designer to conduct whatever testing and investigation are necessary to determine that the foundation of the structure will be stable. The rule requires the designer to determine if it is necessary to conduct laboratory tests of foundation material depending upon whether tests of similar material already have been conducted or are available.

One commenter supported the provision as a logical and sound engineering practice. Two commenters suggested that, although the requirement that foundation and abutments be stable during construction and operation is justified, the provision concerning the determination of the adequacy and accuracy of the foundation information is vague. Instead of this requirement, these commenters suggested, the engineer should be given the latitude to use judgment in evaluating the foundation and abutment conditions to ensure that the performance standard is met in accordance with current, prudent, engineering practice.

OSMRE agrees that the alternative proposed by the commenter expresses a similar intent; however, the rule language is more specifically aimed at acquiring adequate and accurate information of the foundation conditions upon which to base subsequent designs.

These same two commenters further maintained that the requirement for foundation investigations and laboratory testing for MSHA-regulated impoundments was redundant and unnecessary. They argued that plans for MSHA structures must comply with the requirements of 30 CFR 77.216-2(a) (5) and (13), which address the properties of the foundation materials and slope stability, respectively. Allowing MSHA to establish the geotechnical information necessary for structures under their jurisdiction, they said, complies with section 201(c)(12) of SMCRA to minimize duplication with other Federal agencies.

Although, as the commenters pointed out, MSHA does address foundations in 30 CFR 77.216-2(a) (5) and (13), the MSHA rules require only that the plan describe the physical and engineering properties of the foundation and the computed minimum factor of safety range for slope stability. OSMRE's provisions, on the other hand, actually stipulate

foundation investigation and laboratory testing requirements for impoundments meeting the requirements of 30 CFR 77.216(a) and supplement rather than duplicate the requirements in the MSHA rules.

Another commenter opposed the proposal to allow increased flexibility in the determination of testing for foundation stability. OSMRE has an obligation, the commenter maintained, to establish minimum standards for ensuring that foundation investigations, including testing, are adequate to ensure the stability of foundations, abutments and foundation material. In view of the increased risk being introduced by allowing land surveyors to certify impoundments (see discussion of Section 816.49(a)(10)), the commenter added, there is a greater need for standardizing testing of impoundments and for ensuring that all impoundment foundations are properly constructed. The commenter concluded that, inasmuch as OSMRE intends to allow greater flexibility to the designing engineer in foundation investigation and construction, a requirement should be adopted for an engineer to inspect and certify each phase of impoundment construction.

The existing regulations in Section 816.49(a)(10)(i) require regular inspection of impoundments during construction. OSMRE believes that this provision satisfies this commenter's concern. OSMRE further believes that it would not be feasible to establish a set of standardized tests for investigation and testing of the foundations of impoundments. As noted in MSHA's Engineering and Design Manual -- Coal Refuse Disposal Facilities (p. 5.53), the type and extent of investigation necessary depends upon the size of the planned embankment, the complexity of the site geology, the nature of the foundation materials, and whether or not the embankment will impound water. Based on the complexity of a site, the site investigation for each project will vary and must be complete enough to provide the necessary data for analysis of the site and the design of the structure. Furthermore, where the required safety factor is achieved over a wide range of foundation conditions, detailed foundation investigation would be unnecessary.

#### SECTIONS 816.49(a)(8)/817.49(a)(8) - PERMANENT AND TEMPORARY IMPOUNDMENT SPILLWAYS; SINGLE SPILLWAY PROVISION

The spillway requirements of Section 816.46(c)(2) are also included in Section 816.49(a)(8) to ensure consistency between the spillway requirements for sedimentation ponds and those for all impoundments. The comments addressed these requirements as they would apply to both Sections 816.46(c)(2) and 816.49(a)(8). The comments and OSMRE's response applicable to all impoundments, including sedimentation ponds, are addressed in the following discussion.

Final Section 816.49(a)(8) has been restructured and single spillway configuration requirements have been added in paragraphs (i) (A) and (B). The reasons for this restructuring and for clarifying the spillway provisions are addressed in the following discussion. All final revisions to Section 816.49(a)(8) have also been made to Section 816.46(c)(2) for sedimentation ponds.

Section 816.49(a)(8) requires that impoundments include either a combination of principal and emergency spillways, or a single spillway designed and constructed to safely pass the applicable design precipitation event (see 2. Spillways in "Background"). Four commenters addressed the single spillway provision; one supported it without qualification while three objected to its application as envisioned in the proposed rule.

One of the objecting commenters suggested that a single spillway is an unacceptable alternative to a combination of principal and emergency spillways in the case of an embankment-type impoundment, regardless of its size. The elimination of the principal spillway, which typically consists of a drop-inlet pipe, the commenter said, would inhibit the pond's storage of water during any storm event, thus affecting the mine operator's ability to treat or contain the water. By requiring the use of both a principal spillway pipe and an open-channel emergency spillway, the commenters suggested, the regulatory authority is assured of a stable, nonerodible system with steady flow and stable velocity that will conduct storm flow safely and without sediment. The same commenter suggested, however, that the single spillway allowance is acceptable in cases of small excavated impoundments because such impoundments are not equipped with the drop-inlet pipe as a primary spillway.

A second commenter objected to the single spillway provision to the extent that it would allow single conduit spillways without ensuring appropriate storage control. Because of safety concerns, the commenter suggested that a single conduit spillway should be allowed only for extremely small drainage areas, perhaps as large as four acres. The commenter pointed out that there are two disadvantages to the single conduit spillway: (1) Near maximum capacity is attained at relatively low heads and there is little increase in capacity beyond the designed head such that a flood larger

than the selected inflow design flood would result in more discharge than the spillway could handle; and (2) overtopping is more likely to occur than with an open-channel spillway because conduit spillways are more likely to become obstructed or clogged. The commenter went on to state that obstruction is even more likely to occur if the structure is a permanent impoundment, due to the minimum or non-existent maintenance after bond release. Therefore, in addition to restricting the use of single conduit spillways to small drainage areas, the commenter suggested that such spillways only be allowed for temporary impoundments and only in cases where failure would not be expected to cause loss of life or serious property damage.

A third commenter presented a threefold objection to the single spillway provision. First, the use of a single spillway has the potential to result in the inability of sedimentation ponds to attain adequate water quality limitations and to adequately remove sediment. The commenter conceded that these problems can be avoided by proper placement of the single spillway outlet and by paying more attention to the removal of sediment to ensure that the sediment storage volume is not exceeded.

The commenter's second concern was that use of a single spillway would result in increased peak stormwater discharges, with increased potential for downstream flooding, particularly in steep-sloped regions of Appalachia where peak discharge response to storm events is quick and the off-site impacts of the increased peak flow due to mining can be severe. The commenter pointed out that Congress was concerned about this problem and intended the hydrologic protections of SMCRA to address the "greater peak flows, more rapid changes in discharge, \* \* \* and increased flooding of streams" resulting from contour mining in Appalachia. (H.R. Rep. No. 95-218, 95th Cong., 1st Sess., 111 (1977).)

The commenter added that discharge problems, which are moderated through the size and configuration of spillways and the existence of storage capability, are exacerbated by any reduction in the ability to control discharge, including the discharge resulting from storm events of a lesser magnitude than the design precipitation event. Thus, the commenter concluded, reliance on a single spillway rather than dual spillways increases the possibility of discharge problems. Even where the single spillway is designed to adequately pass the design event, the commenter added, it results in the creation of a permanent pool immediately below the spillway, thus eliminating the capability of the pond to control stormwater runoff and to moderate the increased downstream peak flow.

This same commenter's third concern was that the use of a single spillway would increase the level of saturation of the pond material and, thereby, threaten the stability of the pond. The commenter's concern about the downstream impacts resulting from this increased likelihood of pond failure was heightened because of the use of embankment ponds on steep-sloped areas.

If OSMRE implements the single spillway provision in proposed Sections 816.46(c)(2) and 816.49(a)(8), the commenter concluded, in order for the impoundment to function safely and effectively, the provision must be accompanied by a requirement that such spillway be an open-channel design because of the potential for pipe or conduit spillways to become blocked and cause structural failure.

In summarizing these three concerns, this same commenter pointed out that OSMRE did not accompany its October 21, 1987, proposal with any references or technical justifications for the adoption of the single spillway provision, nor did OSMRE address the ability of impoundments to attain, under various conditions, the water quality discharge limits, to moderate peak flow, and to prevent additional contributions of runoff outside the permit area in order to prevent flooding or flood height increases. The commenter urged OSMRE to conduct sensitivity analyses and computer modeling of small, medium and large watersheds under various mining conditions to determine the impacts of the proposed single spillway provision. The commenter further suggested that, upon completion of the above analyses, the comment period be reopened for more discussion of the proposed provision.

OSMRE believes that the concerns of the commenters are satisfied by the performance standards, certification and bond release requirements of OSMRE's rules. The qualified registered professional must consider the impacts of increased peak storm water discharges, saturation of the pond material and other specific design parameters on the structural plan in the design and certification of the impoundment. If a structure is designed with an open-channel serving as both a principal and emergency spillway, it must meet all of the provisions of the regulations. For instance, the discharge water in a sedimentation pond must meet the effluent limitations of Section 816.46(c)(1)(iii) (B) and (C). Also, in determining the safety factor, consideration must be given to any increase in the water level caused by using a single open-channel spillway.

As a result of the review of comments and further technical consideration, OSMRE has modified this provision to allow the regulatory authority to approve a single spillway only when it is of open-channel configuration meeting the requirements of Section 816.49(a)(8)(i). OSMRE believes that a closed-conduit type spillway alone will not likely pass the design precipitation event without a considerable reliance on storage. In the absence of a combination of principal and emergency spillways or a single open-channel spillway meeting the requirements of Section 816.49(a)(8)(i), an impoundment would have to meet the requirements in Section 816.49(c)(2) for structures relying primarily on storage.

#### SECTIONS 816.49(a)(8)(i)/817.49(a)(8)(i) - PERMANENT AND TEMPORARY IMPOUNDMENT SPILLWAYS; SPILLWAY LININGS

The requirements included in Section 816.49(a)(8)(i) relative to spillway linings are also included in Section 816.49(c)(2)(i) to ensure consistency between the spillway requirements in the rules for sedimentation ponds and those for all impoundments. Comments received on these proposed sections addressed these requirements as they would apply to both. Those comments and OSMRE's response applicable to all impoundments, including sedimentation ponds, are addressed in the following discussion.

OSMRE had proposed in Section 816.49(a)(8) to prohibit the use of earth- or grass-lined single spillways. This prohibition was first introduced in the 1983 rules for small sedimentation ponds at Section 816.46(c)(2)(ii) to provide an additional safeguard to the use of single spillways in such ponds (*48 FR 44046*). Hence, in proposing to allow the use of a single spillway for impoundments under Section 816.49(a)(8), OSMRE considered it appropriate to include the prohibition on earth- or grass-lined single spillways found in the previous rules for small sedimentation ponds.

OSMRE received eight comments on this provision, seven of which opposed various aspects of the prohibition against earth- or grass-lined spillways. As a result of the review of comments and further technical consideration, OSMRE has modified the prohibition against grass- and earth-lined spillways. In its place, language has been added to final Section 816.49(a)(8)(i)(B) that specifies that the regulatory authority may approve a single earth- or grass-lined spillway designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected. Also, the requirement at paragraph (a)(8)(i)(A) specifies that the regulatory authority may approve a single open-channel spillway of nonerodible construction and designed to carry sustained flows. These same revisions have been made to the final rule for sedimentation ponds at Section 816.46(c)(2)(i) (A) and (B).

One commenter suggested that the prohibition against earth- or grass-lined spillways was unnecessary in sparsely populated areas where impoundments present little risk to life and property, such as Wyoming. In addition, the commenter maintained that it was possible to design stable earth- or grass-lined channels for flood flows.

Another commenter suggested that restrictions on grass-lined channels for small impoundments were inappropriate for semi-arid States, such as North Dakota, where such spillways generally function adequately because of the rare occurrences of flows through emergency spillways. The commenter maintained that this is because impoundments in North Dakota are designed to contain the runoff from a 10-year 24-hour or larger precipitation event and are dewatered after precipitation events to ensure control through storage. Although, the commenter acknowledged, grass-lined spillways are not ideal for "sustained flows," requiring that a spillway be "capable of maintaining sustained flows" is unnecessary in areas where sustained flows are rarely experienced. The commenter suggested that OSMRE recognize regional differences in spillway requirements by qualifying this provision to allow the regulatory authority to approve grass-lined open channels where there are no sustained flows.

Another commenter agreed with OSMRE in the prohibition of earth-lined spillways, but criticized the restriction on grass-lined spillways for essentially the same reason as the previous commenter: Not all spillways are subject to sustained flows. This commenter went on to point out that the provision requiring that spillways be of nonerodible construction could be interpreted to prohibit the use of rock-lined spillways which are capable of handling sustained flows. Additionally, the commenter noted that adequate single spillways can be designed with a combination lining of both rock and grass such that the sustained flows are channeled through the rock portion while the occasional storm flows pass over the grass portion. The commenter suggested that the language in Section 816.49(a)(8) should be revised to recognize that linings such as grass and rock can be nonerodible provided that spillway design ensures that flow velocities do not exceed certain critical limits.

This same commenter also suggested that OSMRE adopt the phrase "single open channel spillway" instead of "open channel single spillway." OSMRE believes that this suggested revision places the various modifiers in their appropriate order and has adopted it, with the addition of a hyphen between "open" and "channel" in the final rule.

Another commenter objecting to the prohibition on earth- and grass-lined spillways maintained that such a prohibition is not supported in the technical literature. The commenter cited SCS Technical Release 60 as a standard which acknowledges permissible flow velocities for vegetation- and earth-lined spillways. By not acknowledging that there are varying site-specific circumstances, the commenter suggested, the proposed rule would not allow engineers the necessary flexibility to design cost effective spillways. It was suggested that OSMRE revise the rule so that engineers would be allowed to exercise professional judgment in determining, in each case, the most cost effective design that will meet the requirement to have a nonerodible spillway.

One commenter noted that spillway stability is influenced by factors other than spillway lining, including the slope of the land at the point of discharge. The commenter maintained that earth- and grass-lined spillways have been used with satisfactory results and that such spillways can meet the requirement in Section 816.49(a)(8) to be of nonerodible construction. Making this provision final, the commenter suggested, would result in a requirement to convert spillways to concrete-lined channels and thus substantially increase costs without adding any benefit. Instead of prohibiting earth- or grass-lined spillways, the commenter advised, OSMRE should require applicants to demonstrate in each case that such spillways are of nonerodible construction and therefore stable.

Taking a similar position to the above commenters, another commenter suggested that prohibition on earth- and grass-lined spillways disregards prudent, engineering practices and drastically exceeds SCS standard guidelines and practices. This commenter also asked if impoundments employing a previously approved earth- or grass-lined spillway would need to be modified to meet the new requirement.

Still another commenter suggested that spillways for impoundments with large reservoir storage capacities could be earth-lined if they infrequently carried water.

Two commenters pointed out that structure without dams, such as incised structures, pose little or no danger to life and property and should not be subject to the strict requirements applicable to impoundments with dams.

As noted by the commenters, grass- or earth-lined spillways are appropriate under certain conditions and when properly designed to safely pass the design storm. In most cases, grass- or earth-lined spillways are used for emergency flows which are infrequent and not sustained. In all cases, the design flow velocity must be below the permissible velocity for the type of spillway lining. The prohibition on grass- or earth-lined spillways was included in the proposed rule to prevent the use of such spillways to carry sustained flows. Based on the comments and the guidelines in SCS Practice Standard 378 and SCS Technical Release 60, OSMRE is allowing grass- or earth-lined spillways when they are designed to carry short term, infrequent flow at non-erosive velocities that can be safely handled by the vegetated or earth spillway. Since the rule has been revised to allow grass- or earth-lined spillways, previously approved spillways would not need to be modified.

Only one commenter addressing this provision suggested a more stringent spillway lining requirement. In order to prevent embankment failure due to erosion of the spillway channel, the commenter suggested, OSMRE should require that all open-channel spillways be constructed in solid ground and not within the impoundment embankment unless the spillway is lined with concrete.

OSMRE appreciates the commenter's concern for properly located and designed spillway channels, but the provisions were not added to the final rule. These are factors that should be considered by the professional who designs and certifies the impoundment and are at a level of detail that is inappropriate for the rule.

#### SECTIONS 816.49(a)(8)(ii)/817.49(a)(8)(ii) - PERMANENT AND TEMPORARY IMPOUNDMENT SPILLWAYS; DESIGN PRECIPITATION EVENTS

The requirements of Section 816.49(a)(8)(ii) relative to design precipitation events also are included in Section 816.46(c)(2)(ii) to ensure consistency between the spillway requirements for sedimentation ponds and those for all impoundments. The comments addressed these requirements as they would apply to both sections. The comments and

OSMRE's response applicable to all impoundments, including sedimentation ponds, are presented in the following discussion.

Final Section 816.49(a)(8)(ii)(A) requires that impoundments meeting the size or other criteria of 30 CFR 77.216(a) be able to pass a 100-year 6-hour precipitation event, or greater event as specified by the regulatory authority. Section 816.49(a)(8)(ii)(B) requires that impoundments not meeting the size or other criteria of 30 CFR 77.216(a) be able to pass a 25-year 6-hour precipitation event, or greater event as specified by the regulatory authority. These two provisions were proposed as paragraphs (a)(8)(i) and (a)(8)(ii), respectively; because of a restructuring of final Section 816.49(a)(8), they appear in paragraphs (ii) (A) and (B), respectively, of the final rule. Similar organizational adjustments have been made in Section 816.46(c)(2) for sedimentation ponds.

In the October 21, 1987, proposed rule, OSMRE had described the impoundments to which the design events in Section 816.49(a) (i) and (ii) would apply as "large impoundments meeting the size or other criteria of Section 77.216(a)" and "small impoundments not meeting the size or other criteria of Section 77.216(a)", respectively. In the final paragraphs at Section 816.49(a)(ii) (A) and (B), the words "large" and "small", respectively, have been deleted because these terms are redundant and possibly confusing in light of the references to the size or other criteria of Section 77.216(a).

The rule also removes previous Section 816.49 (b)(7) and replaces (c)(2) with a new provision concerning storage impoundments (discussed later). The previous Section 816.49 (b)(7) and (c)(2) stipulated two different design precipitation events, depending on whether an impoundment was permanent or temporary. The sections were removed because it is more appropriate from a safety standpoint to make the design precipitation event dependent upon whether an impoundment is large or small, respectively, rather than whether it is permanent or temporary. The 100-year 6-hour design precipitation event for larger impoundments under Section 816.49(a)(8)(ii)(A) is the same as the event in Section 816.46(c)(2)(ii)(B) for larger sedimentation ponds. Likewise, the 25-year 6-hour design precipitation event for smaller impoundments under Section 816.49(a)(8)(ii)(A) is the same as the event in Section 816.46(c)(2)(ii)(B) for smaller sedimentation ponds. The changes require that all impounding structures, except for structures constructed of coal mine waste or intended to impound coal mine waste and meeting the criteria in 30 CFR 77.216(a), be designed to meet one of the two specified precipitation events depending on impoundment size. See Sections 816.84(b)(2) through 817.84(b)(2) for the design events that apply to coal mine waste impounding structures.

OSMRE received two comments on the requirements applicable to larger impoundments. One commenter concurred with OSMRE's proposed provision on the specified design event for larger impoundments. A second commenter objected to the specified 100-year 6-hour event for impoundments meeting MSHA criteria because MSHA does not necessarily require the 100-year 6-hour event in all cases. The commenter suggested that OSMRE revise the provision to require adherence to MSHA standards without specifying the design event.

As stated in the discussion of comments on other provisions of these rules, OSMRE's responsibility under SMCRA is not the same as MSHA's responsibility under the Federal Coal Mine Health and Safety Act of 1969. Where OSMRE adopts more stringent requirements than MSHA it does so consistent with SMCRA's mandate to protect society and the environment.

OSMRE received eight comments on the design event in Section 816.49(a)(8)(ii)(B) applicable to smaller impoundments. Four commenters requested that OSMRE return to the requirement in the 1979 regulations whereby such impoundments were subject to a 25-year 24-hour event. One of the four commenters pointed out that most existing small impoundments in North Dakota were designed, approved, and constructed under the 25-year 24-hour event requirement, and that these impoundments continue to operate without problems. This design event, the commenter added, is an adequate standard consistent with SCS Practice Standard 378. To require the 25-year 6-hour event, this commenter suggested, would have significant economic effects with negligible additional benefit, especially in light of the fact that the regulatory authority already has the authority to require a more stringent design event in individual cases, as warranted, where failure would be expected to cause loss of life or serious property damage.

Another of the four commenters favoring the 25-year 24-hour event maintained that requiring the new design event for small impoundments would necessitate the rebuilding of most existing small impoundments. The commenter suggested that the least costly method of providing for the passage of this larger peak flow, to increase the height of the embankment to provide more temporary storage and a greater head on the discharge structure during the design event,

would not always be possible because of topographic and stability constraints. Alternatives, the commenter maintained, would include widening earth-channel spillways or, in some cases where drop-inlet spillways are used, removal of the entire embankment and reconstruction with larger drop-inlet spillways.

Still another of the four commenters pointed out that Pennsylvania has successfully employed the SCS 25-year 24-hour standard by requiring the routing of different storm events through the impoundment or sufficient storage in the impoundment to contain the runoff from the storm event. In addition, the commenter noted, the storm event that is applied increases in magnitude as the pond drainage area increases. On the other hand, the Federal 6-hour requirement, the commenter pointed out, while resulting in higher peak rainfall and runoff values, results in lower total runoff values than the 24-hour event. Further, the commenter maintained that the 6-hour event originated from MSHA requirements for coal waste impounding structures which necessitate a more stringent requirement because of the available storage for surface runoff and the need to route the entire storm event through the emergency spillway. However, in the case of non-coal waste impoundments, which normally contain appreciable runoff storage capacities, the commenter suggested that the regulatory authority be allowed to specify the use of other currently accepted design events such as the 24-hour duration event accepted by the SCS and employed in Pennsylvania.

One commenter suggested that OSMRE add a new subsection stipulating that all spillways having designs previously approved by the regulatory authority that have good compliance records shall be exempted from the new rules.

OSMRE adopted the 25-year 6-hour design precipitation event in 1983 to provide consistency with the requirements for temporary impoundments (*48 FR 44046*). These same requirements were repropounded in 1987 (*52 FR 39364*) to provide for consistency between siltation structures and impoundments. As noted by the commenter, the 25-year 6-hour event probably results in higher peak rainfall intensity and runoff values than the 24-hour event, but in lower total runoff values. OSMRE selected the 25-year 6-hour event to guard against sudden, potentially more dangerous storms of short duration. The final rule will remain as proposed; however, the regulatory authority may specify, in accordance with Section 780.25(c)(3), other standards that are in accordance with current, prudent, engineering practices.

Two other commenters suggested that, in light of the fact that a permanent impoundment will likely have a life of more than 25 years, all permanent impoundments, including those not meeting the MSHA criteria, should be subject to the 100-year 6-hour design requirement.

The SCS recommends a minimum design storm of 50-year frequency for the largest structure, whether permanent or temporary, that can be built under SCS Practice Standard 378. Based on this standard, OSMRE disagrees with the suggestion that the 100-year 6-hour design event should be required for small permanent impoundments. OSMRE believes that it is more appropriate to base the design storm on the size of the structure, which is more closely related to hazard potential, than on the life of the structure. Further, regulatory authorities can exercise discretion and specify a greater design event than the 25-year 6-hour event on a case-by-case basis if they believe that the expected life of the impoundment or potential hazard of the impoundment warrants more stringent requirements.

Another commenter found the 25-year 6-hour event requirement acceptable, but asked if impoundments designed under the 10-year 24-hour event and approved by both the State and OSMRE, would need to be modified to meet the new requirement. Also, the commenter asked whether the design event pertained to the spillway requirement or the containment capacity of the impoundment.

The 10-year 24-hour event is the containment and treatment requirement of Section 816.46(c)(1)(iii)(C) relative to effluent limitations, and generally an impoundment meeting that requirement would not need to be modified. This containment and treatment requirement is not affected by the design storm events that apply to spillways in this rule. However, if the impoundment storage necessary to control the runoff from the design precipitation event exceeds the storage needed to contain or treat the 10-year 24-hour event, the size of the impoundment would have to meet the larger storage requirement.

#### SECTIONS 816.49(a)(10)/817.49(a)(10) - INSPECTION OF IMPOUNDMENTS

Section 816.49(a)(10) specifies the qualified professionals who are authorized to meet the requirement for inspecting each impoundment in accordance with paragraph (a)(10)(i) of that section. In addition to the professionals listed in the

previous rule, inspections also may be performed by qualified registered professional land surveyors as specified in paragraph (a)(10)(iv). See 6. Inspection of impoundments in "Background" for rationale for the change.

Also, Section 816.49(a)(10)(ii) authorizes a qualified registered professional land surveyor as specified in paragraph (a)(10)(iv) to provide the certified report of the inspection results to the regulatory authority. In addition to this change, a language change was made to the 1983 rule. The language in this section that the impoundment has been "constructed and/or maintained" as designed differs from the language in the 1983 rule which read "constructed and maintained." This change is intended to make clear that the construction will not necessarily have to be recertified every time a maintenance inspection is conducted.

Section 816.49(a)(10)(iv) authorizes certain qualified registered professional land surveyors, in accordance with Section 780.25(a), to inspect, certify and submit the report required for any temporary or permanent impoundment that does not meet the size or other criteria of 30 CFR 77.216(a), except for coal mine waste impounding structures (see 6. Inspection of impoundments in "Background"). In accordance with Section 780.25(a), a qualified registered professional land surveyor is authorized to inspect and certify small impoundments in any State which authorizes land surveyors to prepare and certify such plans. The rule does not allow land surveyors to certify coal mine waste impounding structures, which are covered by Section 816.84. OSMRE believes that the more complicated design and construction requirements of coal mine waste impounding structures necessitate certification by a professional engineer. The rule also requires that the land surveyor be experienced in the construction of impoundments to be consistent with the experience requirement for professional engineers in Section 816.49(a)(10).

The changes in paragraphs (a)(10)(ii) and (a)(10)(iv) are not to be confused with the provision in the introductory language in paragraph (a)(10) allowing inspections by a "qualified professional specialist, under the direction of a professional engineer." The requirement in the introductory language is retained from the 1983 rule. Under paragraphs (a)(10)(ii) and (a)(10)(iv), the "qualified registered professional land surveyor" will be authorized to conduct certain inspections and certify reports independently. Under the provision in the introductory language in paragraph (a)(10), the "qualified professional specialist" can perform inspections only under the direction of a "professional engineer."

One commenter supported the provision in Section 816.49(a)(10)(ii) requiring that all inspection reports be filed with the regulatory authority immediately following the inspection. Several commenters objected to this provision on the basis that it would create unnecessary paperwork. They suggested that maintaining inspection records on the mine site and submitting them periodically would be adequate. One commenter further added that the proposed requirement could trigger the issuance of unnecessary notices of violation by regulatory authorities, while other commenters suggested that some regulatory authorities do not want the records sent to their offices but prefer that they be kept at the mine site to reduce their paperwork problems.

OSMRE believes it is necessary to have the inspection report sent to the regulatory authority so that any problems can be brought to the State's attention, and in order to provide the State the opportunity to adequately monitor corrective actions that may be necessary. Having the information on file in the State office also provides advance information to inspectors before beginning an inspection trip. OSMRE is sensitive to the concern that regulatory authorities' paperwork burdens should be reduced where possible. However, several regulatory authorities commented on this proposed rule, and none suggested that this reporting requirement presented a burden.

Two of the commenters who objected to the filing requirements also objected to the requirement for an annual inspection and certification by a registered professional engineer for all impoundments, regardless of size, on the basis that it is unnecessary and would result in yet another paperwork requirement for operators without effecting an added public benefit. They noted that presently only structures meeting MSHA criteria must be certified annually and argued that if small impoundments are properly designed and constructed, an annual inspection by a qualified person, not necessarily an engineer, should be sufficient to detect any significant structural problems.

This commenter incorrectly maintained that annual certifications are required only for those impoundments meeting MSHA criteria. Under existing Section 816.49(a)(10)(i), which was not repropoed, inspections are required for all impoundments "at least yearly," while under paragraph (a)(10)(ii), the inspector must "promptly, after each inspection, provide to the regulatory authority a certified report \* \* \*." Again, for the same reasons mentioned above, OSMRE considers the annual certification to the regulatory authority to be an important component of impoundment safety and protection of the public.

Two commenters suggested that there was an inconsistency between OSMRE's inspection and certification provisions. They maintained that where an engineer performs the quarterly inspection of impoundments not meeting MSHA criteria under paragraph (a)(11), it is necessary under paragraph (a)(10)(ii) to certify the results each quarter. This, the commenter suggested, conflicts with the annual inspection requirement in paragraph (a)(10)(i). The point the commenter made is that, so long as MSHA has determined that regulating smaller structures is unnecessary, and that annual certifications are not required, it would seem reasonable for OSMRE to adopt the same regulatory philosophy. Any significant problems with small impoundments, the commenter concluded, would be observed and brought to the operator's attention during the regulatory authority's complete quarterly inspection.

OSMRE considers the inspection and certification requirement of Section 816.49(a)(10) and the "examination" requirement of paragraph (a)(11) to be distinctly different requirements serving distinctly different purposes. The examination under paragraph (a)(11) by a "qualified person" occurs quarterly for impoundments not meeting the criteria of 30 CFR 77.216(a) and weekly for those meeting the criteria. This serves the need to monitor large impoundments more frequently because of their greater potential hazard. The inspection and accompanying certification by a "qualified registered professional engineer" or a "qualified registered professional land surveyor" under paragraph (a)(10) ensures a more stringent level of inspection and ensures that the regulatory authority is made aware of the condition of impoundments.

OSMRE does, however, recognize that the clarity of the proposed inspection and examination provisions could be improved as noted by the commenter. Therefore, OSMRE has revised paragraph (a)(10)(ii) in the final rule to read, "The qualified registered professional engineer, or qualified registered professional land surveyor as specified in paragraph (a)(10)(iv) of this section, shall promptly, after each inspection required in paragraph (a)(10)(i), provide the regulatory authority with a certified report that the impoundment has been constructed and/or maintained as designed and in accordance with the approved plan and this chapter." The added reference will make clear that the certification report requirement does not apply to the examination referenced in paragraph (a)(11).

As discussed previously relative to storage control in Section 816.49(a)(10), a commenter maintained that the inspection and certification provisions of the proposed rules are not consistent. The commenter suggested that the provision in Section 816.49(a)(8) requiring that impoundments relying primarily on storage demonstrate sufficient control in the judgment of a qualified registered professional engineer contradicts the land surveyor provision of Section 816.49(a)(10)(iv) authorizing land surveyors to certify impoundments not meeting the criteria of 30 CFR 77.216(a).

OSMRE believes this comment has merit and has changed Section 816.49(a)(8) of the final rule to allow qualified professional registered land surveyors to certify structures that rely primarily on storage to control the design precipitation event and, thus, remove a limitation on the land surveyor provision of Section 816.49(a)(10)(iv). This change makes the rules consistent with the authority of qualified registered professional land surveyors to certify impoundments that do not meet the criteria of 30 CFR 77.216(a).

One commenter supported the land surveyor inspection and certification provision, suggesting that land surveyors are as qualified as engineers to make the physical measurements that are involved in post-construction certification.

One commenter urged rejection of the provision at Section 816.49(a)(10)(iv) authorizing qualified registered professional land surveyors to inspect and certify impoundments not meeting the MSHA criteria, suggesting that it would weaken the enforcement process and contribute to the construction of potentially hazardous structures because land surveyors lack the technical expertise in the hydraulics of impoundment dam and spillway design. This commenter also maintained that regulatory authorities' workload prevents them from devoting the necessary technical staff to investigate and determine if land surveyors are experienced in the construction of impoundments. This same commenter also asked how much experience in impoundment dam, embankment, and spillway construction a land surveyor must have in order to be competent to certify impoundments.

One commenter was alarmed by the proposal in Section 816.49(a)(10)(iv) to authorize land surveyors to inspect and certify impoundments not meeting the size or other criteria of 30 CFR 77.216(a), maintaining that the provision may result in the certification of impoundments by individuals lacking proper training and knowledge of hydrologic and geologic considerations attendant to such structures. This commenter also incorporated by reference earlier objections to

the October 2, 1984 (*49 FR 38958*), proposed provision to allow land surveyors to certify the design of impoundments not meeting the criteria of 30 CFR 77.216(a), which was issued in final on April 24, 1985 (*50 FR 16194*).

This commenter reaffirmed an objection to the 1985 rule on the basis that it authorized land surveyors to certify the design of components of plans that the commenter believed were outside of the professional capability of land surveyors and beyond the intent of the November 4, 1983, amendment to SMCRA. The commenter voiced opposition to allowing the design of any water-retaining impoundments, regardless of size, by anyone other than a qualified, registered professional engineer with experience in the design of such impoundments. Such an allowance, the commenter maintained, in addition to creating a significant public hazard, is inconsistent with the November 4, 1983, SMCRA amendment which did not intend to authorize land surveyors to certify the design of such components.

In response to this commenter's concerns about the 1984 proposal (*50 FR 16195*), OSMRE noted that activities properly within the field of surveying vary among the States and that the rule authorized "surveyors only to perform those functions in a particular State for which they have authority under State law." Because of variations that exist from State to State, OSMRE declined to further restrict properly authorized land surveyors in design certification and continues to maintain the same position.

In objecting to the October 21, 1987, proposal in paragraph (a)(10)(iv) of Section 816.49 to allow qualified registered professional land surveyors to inspect and certify impoundments not meeting the size or other criteria of 30 CFR 77.216(a), the commenter noted the wide disparity among various States in the qualifications and capabilities of professional land surveyors to undertake such certifications. It is precisely because of this disparity that OSMRE must rely on State licensing authorities to ensure that land surveyors are authorized to perform only those design certifications that they are qualified to perform in consideration of their background, training, and experience.

This same commenter further addressed two fundamental concerns. First, as with the objection to the design certification provision of the 1985 rule, the commenter suggested that the annual inspection and certification of impoundments is a matter which involves questions of material stability and geology which are outside of the traditional competence of the surveying profession. In support of this contention, the commenter quoted from a statement to the Congress by the American Institute of Professional Geologists (AIPG) supporting the 1983 SMCRA amendment: " \* \* \* the 'lead' or primary role for preparation and certification of geological and geotechnical documents is the sole responsibility of professional geologists or of registered professional engineers qualified in the earth sciences." The commenter urged OSMRE to add limiting language to Section 816.49(a)(10)(iv) such that, in addition to restricting the provision to any State which authorizes land surveyors to prepare and certify plans for impoundments, it would be restricted to States which authorize land surveyors to perform and certify inspections of impoundments.

This same commenter's second fundamental concern was that OSMRE must establish national minimum standards for experience and training of land surveyors in the area of impoundment certification to avoid problems in States which (1) do not have minimum qualifications for engaging in the practice of land surveying; or (2) may have standards that do not suffice to ensure a minimum level of competence in this technical area; or (3) allow "grandfathering" of practicing land surveyors based solely on surveying experience without requiring any formal training. The requirement in the proposed rule, "shall be experienced in the construction of impoundments," the commenter argued, was vague and not sufficient to ensure a minimum level of competence. The commenter concluded, limiting this provision to those impoundments that do not meet MSHA criteria does not ensure adequate safety because such impoundments still may present a threat to the public and the environment.

As discussed elsewhere in this preamble (see 6. Inspection of Impoundments in I. Background), OSMRE found that comments received during the preparation of the 1985 final rule authorizing design certifications by land surveyors presented compelling arguments for authorizing qualified registered professional land surveyors to inspect and certify those impoundments not meeting the criteria of 30 CFR 77.216(a). Certainly it is reasonable to accept that if land surveyors are qualified to certify design and construction, then they would also be qualified to inspect the impoundments that they have designed.

OSMRE acknowledges concerns about the technical qualifications of land surveyors in the hydraulics of impoundment dam and spillway design. Consequently, OSMRE limited this authority to impoundments not meeting the size or other criteria of 30 CFR 77.216(a). Also, OSMRE requires that the land surveyor shall have experience in the construction of impoundments, in accordance with paragraph (a)(10)(iv). Furthermore, the rule provide many levels of protection, of

which design certification is only one. Section 816.49(a)(2) requires that the certifying land surveyor have previous experience in impoundment design and construction. Any design which is certified by a land surveyor must conform to the performance standards of the regulatory program and be submitted to the regulatory authority for review as part of a permit application. Under Section 816.49(a)(10), impoundments are given frequent inspections, while under Section 816.49(a)(11), all small impoundments are examined for structural weakness and hazardous conditions at least quarterly. Thus, OSMRE concludes that it is proper to authorize qualified registered professional land surveyors to certify the design and construction of small impoundments.

Concerning the commenter's suggestion that OSMRE add limiting language to Section 816.49(a)(10)(iv) restricting its application to States which authorize land surveyors to perform and certify inspections of impoundments, OSMRE does not see what this would change in practice. If land surveyors lack the authority under a State law to inspect impoundments, then, it follows, this provision in OSMRE's rules would not apply in such a State.

Another commenter made the general suggestion that professional geologists should be more involved in the design and certification of impoundments. This rule does not affect the authority previously granted to professional geologists.

A final commenter on the land surveyor provision suggested that OSMRE also allow qualified registered landscape architects to certify maps and plans for small impoundments, certify construction, and perform annual inspections. The commenter maintained that most landscape architects are trained in hydrology for calculating storm water runoff; hydraulics for designing ditches and culverts; earthwork for determining cut and fill volumes, required grading and construction techniques; and soil mechanics for determining the behavior of soil under various loading conditions. Coupled with practical experience and registration, the commenter suggested, the landscape architect is very capable of developing plans, managing construction, and conducting annual stability and hazardous-condition inspections on all small impoundments.

The November 4, 1983, and October 30, 1986, amendments to SMCRA specifically authorized an expanded role for land surveyors in impoundment design, but do not provide such authorization to landscape architects. This rule does not authorize landscape architects to prepare independently or to certify cross sections, maps and plans. Lacking proper authorization, it would be inappropriate for OSMRE to consider such revisions to the rules at this time.

#### SECTIONS 816.49(c)(2)/817.49(c)(2) - TEMPORARY IMPOUNDMENTS; STORAGE CONTROL

The requirements included in Section 816.49(c)(2) concerning the use of storage to control the design precipitation event are also included in Section 816.46(c)(2)(iii) to ensure consistency between the spillway requirements in the rules for sedimentation ponds and those in the rules for all impoundments. Comments on these sections addressed these requirements as they would apply to both sections. Those comments and OSMRE's response applicable to all impoundments, including sedimentation ponds, are addressed in the following discussion.

Under final Section 816.49(c)(2), the regulatory authority is authorized to approve the design of a temporary impoundment that relies primarily on storage to control the runoff from the design precipitation event in lieu of meeting the requirements in Section 816.49(a)(8)(i) when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor in accordance with Section 780.25(a) that the impoundment will safely control the design precipitation event, the water from which will then be safely removed, in accordance with current, prudent, engineering practices. The regulatory authority may only approve such an impoundment if it is located where failure would not be expected to cause loss of life or serious property damage except where (1) in the case of an impoundment meeting MSHA criteria, it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or (2) in the case of an impoundment not meeting MSHA criteria, it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

A similar storage control provision was proposed on October 21, 1987, in Section 816.49(a), but has been moved in the final rule to Section 816.49(c) in response to a comment suggesting that it only apply to temporary impoundments (comment discussed later). This same language is included in Section 816.46(c)(2)(iv) for sedimentation ponds, which generally are temporary structures, to ensure consistency between the provisions applicable to temporary impoundments and those applicable to sedimentation ponds. Section 816.46 does not contain separate provisions for permanent and temporary sedimentation ponds. However, because the requirements in Section 816.49 apply to all impounding

structures, a permanent sedimentation pond would have to meet all of the requirements applicable to permanent impoundments in Section 816.49(a) and 816.49(b).

OSMRE believes that this new provision will be useful for those impoundments where the runoff area is small, or where pumps or a decant structure would be used to control the water level in the facility. As OSMRE stated in the October 21, 1987, preamble to the proposed rule (52 FR 39360), OSMRE believes that current, prudent, engineering practice requires that at least 90 percent of the water stored during the design precipitation event be removed within the 10-day period following the design precipitation event.

Two commenters suggested that OSMRE's proposed prohibition on storage impoundments with moderate or high downstream hazard potential was unjustified. The commenters maintained that such impoundments pose no greater downstream threat than conventional impoundments (those with spillways) provided they are designed in accordance with current, prudent, engineering practices. The commenters pointed out that removing at least 90 percent of the water stored during the design precipitation event within the 10-day period following the event is the same criteria as that of the MSHA for high hazard conventional impoundments. These commenters also maintained that current, prudent, engineering practice accounts for increased hazard potential by designing for a larger precipitation event.

OSMRE proposed a prohibition on using impoundments that rely primarily on storage to control the runoff from the design precipitation event in the absence of an adequate or any spillway where they may pose a downstream hazard because of safety concerns. However, OSMRE also recognizes that the safety of such structures can be reasonably assured by requiring that they meet especially stringent design precipitation event requirements. In response to these comments, OSMRE added the provisions at Sections 816.49(c)(2) (A) and (B) authorizing the regulatory authority to approve the design of impoundments that rely primarily on storage if such impoundments are located where failure would not be expected to cause loss of life or serious property damage, except where (1) in the case of an impoundment meeting MSHA criteria, it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or (2) in the case of an impoundment not meeting MSHA criteria, it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

The regulatory authority may find it appropriate to increase either the size or the duration of the event, or both, on a case-by-case basis depending on design concerns. For example, some large impoundments may warrant the application of the probable maximum precipitation of a 36-hour event. The design procedures of MSHA's Engineering and Design Manual -- Coal Refuse Disposal Facilities include recommendations for the design precipitation event and flood routing techniques for designing structures in hazardous locations.

Two commenters suggested that, if OSMRE intends to equate the 10-day/90-percent removal standard with current, prudent, engineering practice, the rule should so specify rather than merely stating such a contention in the preamble. Another commenter suggested that OSMRE require and implement through the State program approval process the development of engineering standards and operational standards (e.g., water testing, decanting protocol) for storage impoundments. The commenter also suggested that OSMRE abandon the 10-day/90-percent removal standard because, in the case of sedimentation ponds, it may actually run counter to the intent of the rule by not providing sufficient detention time to allow for settlement of suspended solids. The commenter added that during the first days after the precipitation event, and particularly in the case of multiple events, water may need to remain in the impoundment without discharge. OSMRE should, the commenter urged, address removal time on a case-by-case basis.

OSMRE is not requiring the 10-day period, 90-percent removal standard as a provision of Section 816.49 for impoundments, but is allowing the necessary flexibility to address water removal procedures on a case-by-case basis. OSMRE believes that this flexibility is particularly important in the case of sedimentation ponds because of the need to allow sufficient time for the settlement of suspended solids, as pointed out by the above commenter. However, OSMRE has retained the 10-day period, 90-percent removal requirement for coal mine waste impounding structures because of the variable nature of coal waste and the resultant stability concerns.

Another commenter maintained that the provision allowing impoundments without a spillway was both foolhardy and dangerous and that OSMRE failed to cite any technical literature to support its proposal. The commenter suggested that this provision, if implemented absent stringent conditions on design and operation, would (1) invite overtopping and structural failure of impoundments; (2) create significant increases in the phreatic surface of impoundments with

potentially attendant structural weakness; (3) result in a likely increase in sediment pond size, a matter of great concern in steep-sloped areas due to question of downstream safety in the event of failure; and (4) necessitate close scrutiny of the sediment clean-out and decanting schedules and plans to ensure that the pond does not become incapable of storing the design event.

This same commenter went on to state that, should this provision become final, OSMRE should explicitly require careful analyses of the phreatic surface and of the stability of storage-based impoundments. Further, the commenter suggested, because there must be continual and routine maintenance of storage-based impoundments to ensure effective functioning through the decanting of stormwater, this provision should not be applied to permanent structures. Should OSMRE insist on applying this provision to temporary impoundments, the commenter followed, engineering standards and operational requirements for such structures must be developed by OSMRE or required to be developed by individual states for OSMRE's approval. Any provision finally adopted, the commenter maintained, presents a host of enforcement-related problems and warrants that OSMRE recognize that the efficacy of storage-based impoundments is dependent on routine and timely maintenance and that the regulatory authority clearly has the duty to make such routine maintenance a permit condition.

This same commenter was further concerned that the 10-day/90-percent removal standard endorsed by OSMRE, although a critical component of any final provision, may be too lenient in cases where two significant storm events occur within a 10-day period or where lesser storms continue over a multi-day period, as is common in the winter, causing structural failure.

In conclusion, this commenter urged that, prior to making this provision final, modeling and sensitivity analyses be conducted on storage-based impoundments under a wide range of watershed configurations and mining conditions to ensure proper restrictions on the use of such structures.

OSMRE agrees with this commenter's suggestion that the allowance for impoundments relying primarily on storage should apply only to temporary impoundments. Permanent impoundments without adequate spillways would present a host of stability and safety problems once regulatory jurisdiction terminates. Therefore, this provision, although originally proposed as part of the general requirements for impoundments in Section 816.49(a), has been moved to the section for temporary impoundments, Section 816.49(c). The new Section 816.49(c)(2) replaces paragraph (2) of the 1983 rules, which specified a design precipitation event requirement for temporary impoundments which is no longer applicable. Language similar to that in Section 816.49(c)(2) has been placed in a new Section 816.46(c)(2)(iii) for sedimentation ponds so that the two requirements applicable to temporary structures are parallel.

The other concerns raised by this commenter may apply to any structure. It is only through the application of experienced judgment by qualified registered professionals that safe and reliable structures are designed, constructed, and inspected. The specific design criteria discussed by the commenter must be considered by the professional during the design sequence, but is an inappropriate level of detail for the rule. Consideration of the potential for overtopping, impoundment failure, increase in phreatic surface, and increase in impoundment size relative to steep-slope locations, need to be made by a professional authorized to design and construct structures. Sediment clean-out and decanting capabilities already must be considered in the inspection and certification of impoundments under existing Section 816.49(a)(10)(ii). Further, States may develop more specific performance and operational requirements to suit their particular regional differences. OSMRE believes that the application of this approach assures proper design and construction of safe impounding structures.

As a result of the review of comments and further technical consideration, OSMRE has replaced the sentence "in the absence of an adequate, or any, spillway," which appeared in the proposed rule, with "in lieu of meeting the requirements in paragraph (a)(8)(i) of this section." Paragraph (a)(8)(i) allows the regulatory authority to approve a single spillway only when it is of open-channel configuration. OSMRE believes that a closed-conduit type spillway alone will not adequately pass the design precipitation event without considerable reliance on storage. In the absence of a combination of principal and emergency spillways or a single open-channel spillway meeting the requirements of Section 816.49(a)(8)(i), an impoundment would have to meet the requirements of Section 816.49(c)(2) for structures relying primarily on storage.

A final commenter maintained that proposed Section 816.49(a)(8) is inconsistent with OSMRE's proposed provision at Section 816.49(a)(10), which allows qualified registered professional land surveyors to inspect and certify

impoundments not meeting MSHA criteria. The commenter suggested that the provision in Section 816.49(a)(8) requiring that impoundments relying primarily on storage demonstrate sufficient control in the judgment of a qualified registered professional engineer contradicts the land surveyor provision discussed here. The commenter suggested that OSMRE should carry over the land surveyor allowance to Section 816.49(a)(8). This, the commenter argued, is consistent with the SMCRA amendments of November 4, 1983, and October 30, 1986, intended to authorize land surveyors to design and certify certain ponds that contain the design event.

OSMRE believes this comment has merit and has made the change in the final rule to allow qualified professional registered land surveyors to certify structures that rely primarily on storage to control the design precipitation event. This will make this provision consistent with other provisions that allow land surveyors to certify impoundments that do not meet the size or other criteria of 30 CFR 77.216(a).

#### SECTIONS 816.84 (b)(2) and (f)/817.84 (b)(2) and (f) - COAL MINE WASTE IMPOUNDING STRUCTURE SPILLWAYS

Because the final spillway requirements for coal mine waste impounding structures are based in large part on the spillway design requirements for permanent and temporary impoundments in Section 816.49(a)(8), Section 816.84(b)(2) was revised to reflect the changes in Section 816.49(a)(8). Rather than require a combination of principal and emergency spillways, Section 816.84(b)(2) requires that each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of 30 CFR 77.216(a) have sufficient spillway capacity to safely pass, adequate storage capacity to safely contain, or a combination of storage capacity and spillway capacity to safely control, the probable maximum precipitation of a 6-hour precipitation event, or greater event as specified by the regulatory authority (see 2. Spillways in "Background"). The design precipitation event is increased from a 100-year 6-hour event to the probably maximum precipitation (PMP) of a 6-hour duration event in order not to conflict with the MSHA guidelines. The PMP is the amount of rainfall that has been determined by meteorologists to represent the maximum storm potential that can be expected for any specific area and in every instance is greater than a 100-year 6-hour storm.

OSMRE believes there is no need to require spillways for impounding structures so long as the structures are designed and constructed in accordance with the requirements of Sections 816.49 and 816.84. Under existing Section 816.84(e), such structures shall be designed so that at least 90 percent of the water stored during the design precipitation event can be removed within a 10-day period. Final Section 816.84(f) requires that, for such structures, at least 90 percent of the water stored during the design precipitation event shall be removed within the 10-day period following the design precipitation event.

One commenter voiced support for the allowance for one spillway in coal mine waste impounding structures, while another commenter stated support for the requirement for a probable maximum precipitation of a 6-hour duration event applicable to spillways.

Three commenters objected to the change in required design event from a 100-year 6-hour event to a probable maximum precipitation of a 6-hour duration event. Despite OSMRE's claim that this would be consistent with MSHA's requirements, the commenters pointed out, MSHA does not necessarily require this design event for spillways. Rather, the commenters added, MSHA's recommended minimum design storm criteria vary with the impoundment volume, depth and hazard potential. The commenters concluded that it would make more sense for OSMRE to remove specific design criteria from this provision and insert language that would simply require adherence to MSHA standards, particularly, as one commenter noted, because MSHA's requirements are complex and subject to change.

As discussed in the sections concerning spillways and size distinctions, OSMRE does not defer to MSHJA in meeting its statutory responsibility. OSMRE has selected the PMP storm for the design of coal mine waste impounding structure spillways to provide protection to society and the environment in line with the mandate of SMCRA. Also, the minimum design storm in the MSHA guidelines applies to both water and coal mine waste impounding structures and, thus, the MSHA guidelines address a wider range of design storms.

Two commenters suggested that the language in proposed Section 816.84(f) was confusing in light of existing language in paragraph (e) of that section. While, the commenter acknowledged, the intent to present a design standard in paragraph (e) and a performance standard in paragraph (f) is understood, the two would be clearer if combined as a

performance standard. As now written, the commenter concluded, proposed paragraph (f) could be misconstrued to not require drawdown for storms less than the design precipitation event.

Section 816.84(e) establishes the performance standard that the impounding structure shall be designed so that at least 90 percent of the water stored during the design precipitation event can be removed within a 10-day period. Section 816.84(f) requires drawdown for the design precipitation event and also discharge of the inflow from smaller storms to maintain the capacity of the impoundment to handle the inflow from the design storm when it occurs. Therefore, paragraph (e) is the required capability of the discharge system, and paragraph (f) is the standard for discharging the runoff in a reasonable time to ensure adequate continued capacity of the structure. Since the proceeding paragraphs serve two distinct functions, OSMRE believes they should be separate paragraphs.

## **COMMENTS ON OTHER RULE PROVISIONS**

OSMRE received several comments on provisions that were not part of the October 21, 1987, proposed rulemaking. Under the Administrative Procedure Act, OSMRE cannot revise the final rule to reflect any of these comments because the public has not been given an opportunity to respond to any proposed language.

One commenter maintained that swamps, dugout ponds, and excavated basins, regulated under 30 CFR 816.45, present almost no hazard potential because they are usually small and have little or no embankment. The commenter suggested that the spillway requirements, stability analyses, and inspection and certification requirements proposed for small impoundments in Section 816.49(a) should not apply to such low-hazard impoundments. In response, OSMRE points out that Section 816.49(a) applies to the sediment control measures in Section 816.45 whenever they meet the definition of impoundments in Section 701.5.

Two commenters suggested amending Section 816.49(a)(6) dealing with slope protection and erosion control because the language is inconsistent and unnecessarily restrictive. Pointing out that paragraph (c)(6) requires slope protection to prevent surface erosion and sudden drawdown, the commenters questioned what, if any, effect slope protection would have in preventing sudden drawdown. The primary problem associated with sudden drawdown, the commenters maintained, is mass stability of an impounding structure embankment. The commenters suggested that OSMRE include performance standards addressing sudden drawdown with other stability standards.

The same commenters voiced concern about Section 816.49(a)(7), which requires that embankment faces be vegetated, except for riprapping of slopes where water is impounded. This provision, commenters maintained, does not allow for the construction of zoned embankments utilizing rock fill for the downstream sections of the structure. They further suggested that rock fill slopes could be designed to prevent erosion and thus meet the ultimate goal of the regulation. In conclusion, the commenters suggested that engineers should be allowed to utilize professional judgment to determine the most cost-effective design to meet the ultimate objective of the performance standard.

One commenter suggested that OSMRE revise Section 816.84(b)(1) to remove the prohibition on retaining coal mine waste impounding structures permanently as part of the approved postmining land use. The commenter cited a recently completed experimental practice that demonstrated the effectiveness of direct vegetation establishment on an abandoned coal mine waste (slurry) impoundment to create a wetland habitat.

All of these comments addressed provisions not included in OSMRE's October 21, 1987, proposed rule. Therefore, they do not affect the final rule.

## **REFERENCE MATERIALS**

Reference materials used to develop this final rule are as follows:

U.S. Soil Conservation Service, Earth Dams and Reservoirs: Technical Release 60, 1985.

U.S. Soil Conservation Service, Pond: Practice Standard 378, 1985.

U.S. Mining Enforcement and Safety Administration, Engineering and Design Manual -- Coal Refuse Disposal Facilities; Prepared by D'Appolonia Consulting Engineers, Inc., Pittsburgh, Pa., 1975.

U.S. Mine Safety and Health Administration, Information Report 1109; Design Guidelines for Coal Refuse Piles and Water, Sediment, or Slurry Impoundments and Impounding Structures, 1979.

U.S. Mine Safety and Health Administration, Amendment to Information Report 1109; Design Guidelines for Coal Refuse Piles and Water, Sediment, or Slurry Impoundments and Impounding Structures, 1983.

Federal Coordinating Council for Science, Engineering and Technology, Federal Guidelines for Dam Safety, 1979.

Karl Terzaghi and Ralph B. Peck, Soil Mechanics in Engineering Practice, second edition, John Wiley & Sons, Inc., 1967.

### **III. PROCEDURAL MATTERS**

#### Effect in Federal Program States and on Indian Lands

The rule applies through cross-referencing in those States with Federal programs. This includes California, Georgia, Idaho, Massachusetts, Michigan, North Carolina, Oregon, Rhode Island, South Dakota, Tennessee, and Washington. The Federal programs for these States appear at 30 CFR Parts 905, 910, 912, 921, 922, 933, 937, 939, 941, 942, and 947, respectively. The rule also applies through cross-referencing to Indian lands under the Federal program for Indian lands as provided in 30 CFR Part 750.

#### Effect on State Programs

Following promulgation of the final rule, OSMRE will evaluate permanent State regulatory programs approved under section 503 of SMCRA to determine whether any changes in these programs will be necessary. If the Director determines that certain State program provisions should be amended in order to be made no less effective than the revised Federal rules, the individual States will be notified in accordance with the provisions of 30 CFR 732.17.

#### Paperwork Reduction Act

The information collection requirements contained in Parts 780, 784, 816, and 817 have been approved by the Office of Management and Budget under *44 U.S.C. 3501* et seq. and assigned clearance numbers 1029-0036, 1029-0039, 1029-0047, and 1029-0048. Sections of this final rule with information collection requirements are 30 CFR 780.25, 784.16, 816.49(a)(10), and 817.49(a)(10); and the public reporting burden of these sections is estimated to average, respectively, 36.1, 17.2, 1, and 1 hours per response. This estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Information Collection Clearance Officer, Office of Surface Mining Reclamation and Enforcement, U.S. Department of the Interior, 1951 Constitution Avenue, NW., Washington, DC 20240; and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

#### Executive Order 12291 and Regulatory Flexibility Act

The DOI has determined that this document is not a major rule under the criteria of Executive Order 12291 (February 17, 1981) and that it will not have a significant effect on a substantial number of small entities under the Regulatory Flexibility Act, *5 U.S.C. 601* et seq. The rule will affect a relatively small number of surface coal mining operations. The rule does not distinguish between small and large entities. The economic effects of the rule are estimated to be minor, and no economic effects are anticipated as a result of the rule.

#### National Environmental Policy Act

OSMRE has prepared an environmental assessment (EA), and has made a finding (FONSI) that this rule will not significantly affect the quality of the human environment under section 102(2)(C) of the National Environmental Policy Act of 1969, *42 U.S.C. 4332(2)(C)*. The EA and FONSI are on file in the OSMRE Administrative Record in Room 5131A, 1951 Constitution Avenue, NW., Washington, DC 20240.

#### Author

The principal author of this rule is Robert A. Wiles, P.E., with assistance from Stephen M. Sheffield, Office of Surface Mining Reclamation and Enforcement, 1951 Constitution Avenue, NW., Washington, DC 20240; Telephone:

202-343-1502 (Commercial or FTS).

## LIST OF SUBJECTS

### 30 CFR Part 780

Reporting and recordkeeping requirements, Surface mining.

### 30 CFR Part 784

Reporting and recordkeeping requirements, Underground mining.

### 30 CFR Part 816

Environmental protection, Reporting and recordkeeping requirements, Surface mining.

### 30 CFR Part 817

Environmental protection, Reporting and recordkeeping requirements, Underground mining.

Accordingly, 30 CFR Parts 780, 784, 816 and 817 are amended as set forth below.

Dated: August 16, 1988.

James E. Cason, Acting Assistant Secretary -- Land and Minerals Management.

## **PART 780 -- SURFACE MINING PERMIT APPLICATIONS -- MINIMUM REQUIREMENTS FOR RECLAMATION AND OPERATION PLAN**

1. The authority citation for Part 780 is revised to read as follows:

Authority: *30 U.S.C. 1201* et seq.; Pub. L. 100-34; and *16 U.S.C. 470* et seq.

2. Section 780.25 is amended by revising paragraph (c) to read as follows:

### **SECTION 780.25 - RECLAMATION PLAN: PONDS, IMPOUNDMENTS, BANKS, DAMS, AND EMBANKMENTS.**

\* \* \* \* \*

(c) Permanent and temporary impoundments.

(1) Permanent and temporary impoundments shall be designed to comply with the requirements of Section 816.49 of this chapter.

(2) Each plan for an impoundment meeting the size or other criteria of the Mine Safety and Health Administration shall comply with the requirements of Sections 77.216-1 and 77.216-2 of this title. The plan required to be submitted to the District Manager of MSHA under Section 77.216 of this title shall be submitted to the regulatory authority as part of the permit application in accordance with paragraph (a) of this section.

(3) For an impoundment not meeting the size or other criteria of Section 77.216(a) of this title and located where failure would not be expected to cause loss of life or serious property damage, the regulatory authority may establish through the State program approval process engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3 specified in Section 816.49(a)(3)(ii) of this chapter.

\* \* \* \* \*

**PART 784 -- UNDERGROUND MINING PERMIT APPLICATIONS -- MINIMUM REQUIREMENTS FOR RECLAMATION AND OPERATION PLAN**

3. The authority citation for Part 784 is revised to read as follows:

Authority: *30 U.S.C. 1201* et seq.; Pub. L. 100- 34; and *16 U.S.C. 470* et seq.

4. Section 784.16 is amended by revising paragraph (c) to read as follows:

**SECTION 784.16 - RECLAMATION PLAN: PONDS, IMPOUNDMENTS, BANKS, DAMS AND EMBANKMENTS.**

\* \* \* \* \*

(c) Permanent and temporary impoundments.

(1) Permanent and temporary impoundments shall be designed to comply with the requirements of Section 817.49 of this chapter.

(2) Each plan for an impoundment meeting the size of other criteria of the Mine Safety and Health Administration shall comply with the requirements of Sections 77.216-1 and 77.216-2 of this title. The plan required to be submitted to the District Manager of MSHA under Section 77.216 of this title shall be submitted to the regulatory authority as part of the permit application in accordance with paragraph (a) of this section.

(3) For an impoundment not meeting the size of other criteria of Section 77.216(a) of this title and located where failure would not be expected to cause loss of life or serious property damage, the regulatory authority may establish through the State program approval process engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3 specified in Section 817.49(a)(3)(ii) of this chapter.

\* \* \* \* \*

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

5. The authority citation for Part 816 is revised to read as follows:

Authority: Pub. L. 95-87, *30 U.S.C. 1201* et seq., as amended; Section 115 of Pub. L. 98-146, *30 U.S.C. 1257*; and Pub. L. 100-34.

6. Section 816.46 is amended by revising paragraphs (b)(3) and (c)(2) to read as follows:

**SECTION 816.46 - HYDROLOGIC BALANCE: SILTATION STRUCTURES.**

\* \* \* \* \*

(b) \* \* \*

(3) Siltation structures for an area shall be constructed before beginning any surface mining activities in that area, and upon construction shall be certified by a qualified registered professional engineer, or in any State which authorizes land surveyors to prepare and certify plans in accordance with Section 780.25(a) of this chapter a qualified registered professional land surveyor, to be constructed as designed and as approved in the reclamation plan.

\* \* \* \* \*

(c) \* \* \*

(2) Spillways. A sedimentation pond shall include either a combination of principal and emergency spillways or a single spillway configured as specified in paragraph (c)(2)(i) of this section, designed and constructed to safely pass the applicable design precipitation event specified in paragraph (c)(2)(ii) of this section, except as set forth in paragraph (c)(2)(iii) of this section.

(i) The regulatory authority may approve a single open-channel spillway that is:

(A) Of nonerodible construction and designed to carry sustained flows; or

(B) Earth- or grass-lined and designed to carry short-term infrequent flows at non-erosive velocities where sustained flows are not expected.

(ii) Except as specified in paragraph (c)(2)(iii) of this section, the required design precipitation event for a sedimentation pond meeting the spillway requirements of paragraph (c)(2) of this section is:

(A) For a sedimentation pond meeting the size or other criteria of Section 77.216(a) of this title, a 100-year 6-hour event, or greater event as specified by the regulatory authority.

(B) For a sedimentation pond not meeting the size or other criteria of Section 77.216(a) of this title, a 25-year 6-hour event, or greater event as specified by the regulatory authority.

(iii) In lieu of meeting the requirements in paragraph (c)(2)(i) of this section, the regulatory authority may approve a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor in accordance with Section 780.25(a) of this chapter that the sedimentation pond will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such a sedimentation pond shall be located where failure would not be expected to cause loss of life or serious property damage, except where:

(A) In the case of a sedimentation pond meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or

(B) In the case of a sedimentation pond not meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

7. Section 816.49 is amended by removing the suspension of paragraphs (a)(3), (a)(5)(i) and (a)(8), revising paragraphs (a)(1), (a)(3), (a)(5)(i), (a)(8), the introductory text of paragraph (a)(10), and paragraphs (a)(10)(ii), (a)(10)(iv), and (c)(2); and removing paragraph (b)(7) to read as follows:

#### **SECTION 816.49 - IMPOUNDMENTS.**

(a) \* \* \*

(1) An impoundment meeting the size or other criteria of Section 77.216(a) of this title shall comply with the requirements of Section 77.216 of this title and this section.

\* \* \* \* \*

(3) Stability.

(i) An impoundment meeting the size or other criteria of Section 77.216(a) of this title or located where failure would be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2.

(ii) Impoundments not meeting the size or other criteria of Section 77.216(a) of this title, except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions or meet the requirements of Section 780.25(c)(3).

\* \* \* \* \*

(5) Foundation.

(i) Foundations and abutments for an impounding structure shall be stable during all phases of construction and operation and shall be designed based on adequate and accurate information on the foundation conditions. For an impoundment meeting the size or other criteria of Section 77.216(a) of this title, foundation investigation, as well as any necessary laboratory testing of foundation material, shall be performed to determine the design requirements for foundation stability.

\* \* \* \* \*

(8) Spillways. An impoundment shall include either a combination of principal and emergency spillways or a single spillway configured as specified in paragraph (a)(8)(i) of this section, designed and constructed to safely pass the applicable design precipitation event specified in paragraph (a)(8)(ii) of this section, except as set forth in paragraph (c)(2) of this section.

(i) The regulatory authority may approve a single open-channel spillway that is:

(A) Of nonerodible construction and designed to carry sustained flows; or

(B) Earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected.

(ii) Except as specified in paragraph (c)(2) of this section, the required design precipitation event for an impoundment meeting the spillway requirements of paragraph (a)(8) of this section is:

(A) For an impoundment meeting the size or other criteria of Section 77.216(a) of this title, a 100-year 6-hour event, or greater event as specified by the regulatory authority.

(B) For an impoundment not meeting the size or other criteria of Section 77.216(a) of this title, a 25-year 6-hour event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

(10) Inspections. Except as provided in paragraph (a)(10)(iv) of this section, a qualified registered professional engineer or other qualified professional specialist under the direction of a professional engineer, shall inspect each impoundment as provided in paragraph (a)(10)(i) of this section. The professional engineer or specialist shall be experienced in the construction of impoundments.

\* \* \* \* \*

(ii) The qualified registered professional engineer, or qualified registered professional land surveyor as specified in paragraph (a)(10)(iv) of this section, shall promptly after each inspection required in paragraph (a)(10)(i) of this section provide to the regulatory authority a certified report that the impoundment has been constructed and/or maintained as designed and in accordance with the approved plan and this chapter. The report shall include discussion of any appearance of instability, structural weakness or other hazardous condition, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability.

\* \* \* \* \*

(iv) In any State which authorizes land surveyors to prepare and certify plans in accordance with Section 780.25(a) of this chapter, a qualified registered professional land surveyor may inspect any temporary or permanent impoundment that does not meet the size or other criteria of Section 77.216(a) of this title and certify and submit the report required by paragraph (a)(10)(ii) of this section, except that all coal mine waste impounding structures covered by Section 816.84 of this chapter shall be certified by a qualified registered professional engineer. The professional land surveyor shall be experienced in the construction of impoundments.

\* \* \* \* \*

(c) \* \* \*

(2) In lieu of meeting the requirements in paragraph (a)(8)(i) of this section, the regulatory authority may approve an impoundment that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor in accordance with Section 780.25(a) of this chapter that the impoundment will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such an impoundment shall be located where failure would not be expected to cause loss of life or serious property damage, except where:

(A) In the case of an impoundment meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or

(B) In the case of an impoundment not meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

8. Section 816.84 is amended by removing the suspension of paragraph (b)(2), revising paragraph (b)(2), and adding paragraph (f) to read as follows:

**SECTION 816.84 - COAL MINE WASTE: IMPOUNDING STRUCTURES.**

\* \* \* \* \*

(b) \* \* \*

(2) Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of Section 77.216(a) of this title shall have sufficient spillway capacity to safely pass, adequate storage capacity to safely contain, or a combination of storage capacity and spillway capacity to safely control, the probable maximum precipitation of a 6-hour precipitation event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

(f) For an impounding structure constructed of or impounding coal mine waste, at least 90 percent of the water stored during the design precipitation event shall be removed within the 10-day period following the design precipitation event.

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

9. The authority citation for Part 817 is revised to read as follows:

Authority: Pub. L. 95-87, 30 U.S.C. 1201 et seq., as amended; Section 115 of Pub. L. 98-146, 30 U.S.C. 1257; and Pub. L. 100-34.

10. Section 817.46 is amended by revising paragraphs (b)(3) and (c)(2) to read as follows:

**SECTION 817.46 - HYDROLOGIC BALANCE: SILTATION STRUCTURES.**

\* \* \* \* \*

(b) \* \* \*

(3) Siltation structures for an area shall be constructed before beginning any underground mining activities in that area, and upon construction shall be certified by a qualified registered professional engineer, or in any State which

authorizes land surveyors to prepare and certify plans in accordance with Section 784.16(a) of this chapter a qualified registered professional land surveyor, to be constructed as designed and as approved in the reclamation plan.

\* \* \* \* \*

(c) \* \* \*

(2) Spillways. A sedimentation pond shall include either a combination of principal and emergency spillways or a single spillway configured as specified in paragraph (c)(2)(i) of this section, designed and constructed to safely pass the applicable design precipitation event specified in paragraph (c)(2)(ii) of this section, except as set forth in paragraph (c)(2)(iii) of this section.

(i) The regulatory authority may approve a single open-channel spillway that is:

(A) Of nonerodible construction and designed to carry sustained flows; or

(B) Earth- or grass-lined and designed to carry short-term infrequent flows at non-erosive velocities where sustained flows are not expected.

(ii) Except as specified in paragraph (c)(2)(iii) of this section, the required design precipitation event for a sedimentation pond meeting the spillway requirements of paragraph (c)(2) of this section is:

(A) For a sedimentation pond meeting the size or other criteria of Section 77.216(a) of this title, a 100-year 6-hour event, or greater event as specified by the regulatory authority.

(B) For a sedimentation pond not meeting the size or other criteria of Section 77.216(a) of this title, a 25-year 6-hour event, or greater event as specified by the regulatory authority.

(iii) In lieu of meeting the requirements in paragraph (c)(2)(i) of this section, the regulatory authority may approve a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor in accordance with Section 784.16(a) of this chapter that the sedimentation pond will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such a sedimentation pond shall be located where failure would not be expected to cause loss of life or serious property damage, except where:

(A) In the case of a sedimentation pond meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or

(B) In the case of a sedimentation pond not meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

11. Section 817.49 is amended by removing the suspension of paragraphs (a)(3), (a)(5)(i) and (a)(8), revising paragraphs (a)(1), (a)(3), (a)(5)(i), (a)(8), the introductory text of paragraph (a)(10), and paragraphs (a)(10)(ii), (a)(10)(iv), and (c)(2); and removing paragraph (b)(7) to read as follows:

#### **SECTION 817.49 - IMPOUNDMENTS.**

(a) \* \* \*

(1) An impoundment meeting the size or other criteria of Section 77.216(a) of this title shall comply with the requirements of Section 77.216 of this title and this section.

\* \* \* \* \*

(3) Stability.

(i) An impoundment meeting the size or other criteria of Section 77.216(a) of this title or located where failure would be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2.

(ii) Impoundments not meeting the size or other criteria of Section 77.216(a) of this title, except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious

property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions or meet the requirements of Section 784.16(c)(3).

\* \* \* \* \*

(5) Foundation.

(i) Foundations and abutments for an impounding structure shall be stable during all phases of construction and operation and shall be designed based on adequate and accurate information on the foundation conditions. For an impoundment meeting the size or other criteria of Section 77.216(a) of this title, foundation investigation, as well as any necessary laboratory testing of foundation material, shall be performed to determine the design requirements for foundation stability.

\* \* \* \* \*

(8) Spillways. An impoundment shall include either a combination of principal and emergency spillways or a single spillway configured as specified in paragraph (a)(8)(i) of this section, designed and constructed to safely pass the applicable design precipitation event specified in paragraph (a)(8)(ii) of this section, except as set forth in paragraph (c)(2) of this section.

(i) The regulatory authority may approve a single open-channel spillway that is:

(A) Of nonerodible construction and designed to carry sustained flows; or

(B) Earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected.

(ii) Except as specified in paragraph (c)(2) of this section, the required design precipitation event for an impoundment meeting the spillway requirements of paragraph (a)(8) of this section is:

(A) For an impoundment meeting the size or other criteria of Section 77.216(a) of this title, a 100-year 6-hour event, or greater event as specified by the regulatory authority.

(B) For an impoundment not meeting the size or other criteria of Section 77.216(a) of this title, a 25-year 6-hour event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

(10) Inspections. Except as provided in paragraph (a)(10)(iv) of this section, a qualified registered professional engineer or other qualified professional specialist under the direction of a professional engineer, shall inspect each impoundment as provided in paragraph (a)(10)(i) of this section. The professional engineer or specialist shall be experienced in the construction of impoundments.

\* \* \* \* \*

(ii) The qualified registered professional engineer, or qualified registered professional land surveyor as specified in paragraph (a)(10)(iv) of this section, shall promptly after each inspection required in paragraph (a)(10)(i) of this section provide to the regulatory authority a certified report that the impoundment has been constructed and/or maintained as designed and in accordance with the approved plan and this chapter. The report shall include discussion of any appearance of instability, structural weakness or other hazardous condition, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability.

\* \* \* \* \*

(iv) In any State which authorizes land surveyors to prepare and certify plans in accordance with Section 784.16(a) of this chapter, a qualified registered professional land surveyor may inspect any temporary or permanent impoundment that does not meet the size or other criteria of Section 77.216(a) of this title and certify and submit the report required by paragraph (a)(10)(ii) of this section, except that all coal mine waste impounding structures covered by Section 817.84 of this chapter shall be certified by a qualified registered professional engineer. The professional land surveyor shall be experienced in the construction of impoundments.

\* \* \* \* \*

(c) \* \* \*

(2) In lieu of meeting the requirements in paragraph (a)(8)(i) of this section, the regulatory authority may approve an impoundment that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor in accordance with Section 784.16(a) of this chapter that the impoundment will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such an impoundment shall be located where failure would not be expected to cause loss of life or serious property damage, except where:

(i) In the case of an impoundment meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the regulatory authority; or

(ii) In the case of an impoundment not meeting the size or other criteria of Section 77.216(a) of this title, it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

12. Section 817.84 is amended by removing the suspension of paragraph (b)(2), revising paragraph (b)(2), and adding paragraph (f) to read as follows:

**SECTION 817.84 - COAL MINE WASTE: IMPOUNDING STRUCTURES.**

\* \* \* \* \*

(b) \* \* \*

(2) Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of Section 77.216(a) of this title shall have sufficient spillway capacity to safely pass, adequate storage capacity to safely contain, or a combination of storage capacity and spillway capacity to safely control, the probable maximum precipitation of a 6-hour precipitation event, or greater event as specified by the regulatory authority.

\* \* \* \* \*

(f) For an impounding structure constructed of or impounding coal mine waste, at least 90 percent of the water stored during the design precipitation event shall be removed within the 10-day period following the design precipitation event.