

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

Sec.

- 817.1 Scope.
- 817.2 Objectives.
- 817.10 Information collection.
- 817.11 Signs and markers.
- 817.13 Casing and sealing of exposed underground openings: General requirements.
- 817.14 Casing and sealing of underground openings: Temporary.
- 817.15 Casing and sealing of underground openings: Permanent.
- 817.22 Topsoil and subsoil.
- 817.41 Hydrologic-balance protection.
- 817.42 Hydrologic balance: Water-quality standards and effluent limitations.
- 817.43 Diversions.
- 817.45 Hydrologic balance: Sediment control measures.
- 817.46 Hydrologic balance: Siltation structures.
- 817.47 Hydrologic balance: Discharge structures.
- 817.49 Impoundments.
- 817.56 Postmining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities.
- 817.57 Hydrologic balance: Stream buffer zones.
- 817.59 Coal recovery.
- 817.61 Use of explosives: General requirements.
- 817.62 Use of explosives: Preblasting survey.
- 817.64 Use of explosives: General performance standards.
- 817.66 Use of explosives: Blasting signs, warnings, and access controls.
- 817.67 Use of explosives: Control of adverse effects.
- 817.68 Use of explosives: Records of blasting operations.
- 817.71 Disposal of excess spoil: General requirements.
- 817.72 Disposal of excess spoil: Valley fills/head-of-hollow fills.
- 817.73 Disposal of excess spoil: Durable rock fills.
- 817.74 Disposal of excess spoil: Preexisting benches.
- 817.81 Coal mine waste: General requirements.
- 817.83 Coal mine waste: Refuse piles.
- 817.84 Coal mine waste: Impounding structures.
- 817.87 Coal mine waste: Burning and burned waste utilization.
- 817.89 Disposal of noncoal mine wastes.
- 817.95 Stabilization of surface areas.
- 817.97 Protection of fish, wildlife, and related environmental values.
- 817.99 Slides and other damage.
- 817.100 Contemporaneous reclamation.
- 817.102 Backfilling and grading: General requirements.
- 817.106 Backfilling and grading: Previously mined areas.
- 817.107 Backfilling and grading: Steep slopes.
- 817.111 Revegetation: General requirements.
- 817.113 Revegetation: Timing.
- 817.114 Revegetation: Mulching and other soil stabilizing practices.
- 817.116 Revegetation: Standards for success.
- 817.121 Subsidence control.
- 817.122 Subsidence control: Public notice.
- 817.131 Cessation of operations: Temporary.
- 817.132 Cessation of operations: Permanent.
- 817.133 Postmining land use.
- 817.150 Roads: General.

817.151 Primary roads.
817.180 Utility installations.
817.181 Support facilities.
817.200 Interpretative rules related to general performance standards.

Authority: 30 U.S.C. 1201 et seq., as amended; sec. 115 of Pub. L. 98-146, 30 U.S.C. 1257; Pub. L. 100-34; and Pub. L. 102-486.

Sec. 817.1 Scope.

FEDERAL REGISTER CITE: 44 FR 14902 (15422)
PUBLISHED DATE: 03/13/79
EFFECTIVE DATE: 04/12/79

This Part sets forth the minimum environmental protection performance standards to be adopted and implemented under regulatory programs for underground mining activities.

Sec. 817.2 Objectives.

FEDERAL REGISTER CITE: 44 FR 14902 (15422)
PUBLISHED DATE: 03/13/79
EFFECTIVE DATE: 04/12/79

This Part is intended to ensure that all underground mining activities are conducted in a manner which preserves and enhances environmental and other values in accordance with the Act.

Sec. 817.10 Information collection.

FEDERAL REGISTER CITE: 60 FR 16722 (16749)
PUBLISHED DATE: 03/31/95
EFFECTIVE DATE: 05/01/95

(a) The collections of information contained in Part 817 have been approved by Office of Management and Budget under 44 U.S.C. 3501 et seq. and assigned clearance number 1029-0048. The information will be used to meet the requirements of 30 U.S.C. 1211, 1251, 1266, and 1309a which provide, among other things, that permittees conducting underground coal mining operations will meet the applicable performance standards of the Act. This information will be used by the regulatory authority in monitoring and inspecting underground mining activities. The obligation to respond is required to obtain a benefit.

(b) Public reporting burden for this information is estimated to average 4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Sec. 817.11 Signs and markers.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)
PUBLISHED DATE: 09/30/83
EFFECTIVE DATE: 10/31/83

- (a) Specifications. Signs and markers required under this Part shall
- (1) Be posted, maintained, and removed by the person who conducts the

underground mining activities;

(2) Be of a uniform design throughout the activities that can be easily seen and read;

(3) Be made of durable material; and

(4) Conform to local laws and regulations.

(b) Duration of maintenance. Signs and markers shall be maintained during all activities to which they pertain.

(c) Mine and permit identification signs.

(1) Identification signs shall be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas for underground mining activities.

(2) Signs will show the name, business address, and telephone number of the person who conducts underground mining activities and the identification number of the current regulatory program permit authorizing underground mining activities.

(3) Signs shall be retained and maintained until after the release of all bonds for the permit area.

(d) Perimeter markers. Each person who conducts underground mining activities shall clearly mark the perimeter of all areas affected by surface operations or facilities before beginning mining activities.

(e) Buffer zone markers. Buffer zones required by Section 817.57 shall be clearly marked to prevent disturbance by surface operations and facilities.

(f) Topsoil markers. Where topsoil or other vegetation-supporting material is segregated and stockpiled as required under Section 817.22, the stockpiled material shall be clearly marked.

Sec 817.13 Casing and sealing of exposed underground openings: General requirements.

FEDERAL REGISTER CITE: 48 FR 43955 (43992)

PUBLISHED DATE: 09/26/83

EFFECTIVE DATE: 10/26/83

Each exploration hole, other drillhole or borehole, shaft, well, or other exposed underground opening shall be cased, lined, or otherwise managed as approved by the regulatory authority to prevent acid or other toxic drainage from entering ground and surface waters, to minimize disturbance to the prevailing hydrologic balance and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit area and adjacent area. Each exploration hole, drill hole or borehole or well that is uncovered or exposed by mining activities within the permit area shall be permanently closed, unless approved for water monitoring or otherwise managed in a manner approved by the regulatory authority. Use of a drilled hole or monitoring well as a water well must meet the provisions of Section 817.41 of this Part. This Section does not apply to holes drilled and used for blasting, in the area affected by surface operations.

Sec. 817.14 Casing and sealing of underground openings: Temporary.

FEDERAL REGISTER CITE: 44 FR 14902 (15423)

PUBLISHED DATE: 03/13/79

EFFECTIVE DATE: 04/12/79

(a) Each mine entry which is temporarily inactive, but has a further projected useful service under the approved permit application, shall be protected by barricades or other covering devices, fenced, and posted with

signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices shall be periodically inspected and maintained in good operating condition by the person who conducts the underground mining activities.

(b) Each exploration hole, other drill hole or borehole, shaft, well, and other exposed underground opening which has been identified in the approved permit application for use to return underground development waste, coal processing waste or water to underground workings, or to be used to monitor ground water conditions, shall be temporarily sealed until actual use.

Sec. 817.15 Casing and sealing of underground openings: Permanent.

FEDERAL REGISTER CITE: 48 FR 43955 (43992)

PUBLISHED DATE: 09/26/83

EFFECTIVE DATE: 10/26/83

When no longer needed for monitoring or other use approved by the regulatory authority upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under Section 817.41, each shaft, drift, adit, tunnel, exploratory hole, entry way or other opening to the surface from underground shall be capped, sealed, backfilled, or otherwise properly managed, as required by the regulatory authority in accordance with Section 817.13 and consistent with Section 75.1711 of this Title. Permanent closure measures shall be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

Sec. 817.22 Topsoil and subsoil.

FEDERAL REGISTER CITE: 48 FR 22091 (22101)

PUBLISHED DATE: 05/16/83

EFFECTIVE DATE: 06/15/83

(a) Removal. (1)(i) All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated.

(ii) Where the topsoil is of insufficient quantity or of poor quality for sustaining vegetation, the materials approved by the regulatory authority in accordance with Paragraph (b) of this Section shall be removed as a separate layer from the area to be disturbed, and segregated.

(2) If topsoil is less than 6 inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

(3) The regulatory authority may choose not to require the removal of topsoil for minor disturbances which--

(i) Occur at the site of small structures, such as power poles, signs, or fence lines; or

(ii) Will not destroy the existing vegetation and will not cause erosion.

(4) Timing. All materials to be removed under this Section shall be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

(b) Substitutes and supplements. Selected overburden materials may be substituted for, or used as a supplement to, topsoil if the operator demonstrates to the regulatory authority that the resulting soil medium is equal to, or more suitable for sustaining vegetation

than, the existing topsoil, and the resulting soil medium is the best available in the permit area to support revegetation.

(c) Storage. (1) Materials removed under Paragraph (a) of this Section shall be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas.

(2) Stockpiled materials shall--

(i) Be selectively placed on a stable site within the permit area;

(ii) Be protected from contaminants and unnecessary compaction that would interfere with revegetation;

(iii) Be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the regulatory authority; and

(iv) Not be moved until required for redistribution unless approved by the regulatory authority.

(3) Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials removed under Paragraph (a)(1) of this Section would be detrimental to the quality or quantity of those materials, the regulatory authority may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that--

(i) Such action will not permanently diminish the capability of the topsoil of the host site; and

(ii) The material will be retained in a condition more suitable for redistribution than if stockpiled.

(d) Redistribution. (1) Topsoil materials removed under Paragraph (a) of this Section shall be redistributed in a manner that--

(i) Achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems;

(ii) Prevents excess compaction of the materials; and

(iii) Protects the materials from wind and water erosion before and after seeding and planting.

(2) Before redistribution of the material removed under Paragraph (a) of this Section, the regarded land shall be treated if necessary to reduce potential slippage of the redistribution material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

(3) The regulatory authority may choose not to require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or of roads if it determines that--

(i) Placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation, and

(ii) Such embankments will be otherwise stabilized.

(4) Nutrients and soil amendments. Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the vegetative cover.

(e) Subsoil segregation. The regulatory authority may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the requirements of Paragraphs (c) and (d) of this Section if it finds that such subsoil layers are necessary to comply with the revegetation requirements of Sections 817.111, 817.113, 817.114, and 817.116.

Sec. 817.41 Hydrologic balance Protection.

FEDERAL REGISTER CITE: 60 FR 16722 (16749)

PUBLISHED DATE: 03/31/95

EFFECTIVE DATE: 05/01/95

(a) General. All underground mining and reclamation activities shall be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The regulatory authority may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented. Mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment.

(b) Ground-water protection. In order to protect the hydrologic balance underground mining activities shall be conducted according to the plan approved under Section 784.14(g) of this Chapter and the following:

(1) Ground-water quality shall be protected by handling earth materials and runoff in a manner that minimizes acidic, toxic, or other harmful infiltration to ground-water systems and by managing excavations and other disturbances to prevent or control the discharge of pollutants into the ground water.

(c) Ground-water monitoring. (1) Ground-water monitoring shall be conducted according to the ground-water monitoring plan approved under Section 784.14(h) of this Chapter. The regulatory authority may require additional monitoring when necessary.

(2) Ground-water monitoring data shall be submitted every 3 months to the regulatory authority or more frequently as prescribed by the regulatory authority. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, then the operator shall promptly notify the regulatory authority and immediately take the actions provided for in Sections 773.17(e) and 784.14(g) of this Chapter.

(3) Ground-water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with the procedures of Section 774.13 of this Chapter, the regulatory authority may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained under this Paragraph, that--

(i) The operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; or

(ii) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under Section 784.14(h) of this Chapter.

(4) Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of ground water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

(d) Surface-water protection. In order to protect the hydrologic balance, underground mining activities shall be conducted according to the plan approved under Section 784.14(g) of this Chapter, and the following:

(1) Surface-water quality shall be protected by handling earth

materials, ground-water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contribution of suspended solids to streamflow outside the permit area; and otherwise prevent water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet the requirements of this Section and Section 817.42, the operator shall use and maintain the necessary water-treatment facilities or water-quality controls.

(2) Surface-water quantity and flow rates shall be protected by handling earth materials and runoff in accordance with the steps outlined in the plan approved under Section 784.14(g) of this Chapter.

(e) Surface-water monitoring. (1) Surface-water monitoring shall be conducted according to the surface-water monitoring plan approved under Section 784.14(i) of this Chapter. The regulatory authority may require additional monitoring when necessary.

(2) Surface-water monitoring data shall be submitted every 3 months to the regulatory authority or more frequently as prescribed by the regulatory authority. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any surface-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the regulatory authority and immediately take the actions provided for in Sections 773.17(e) and 784.14(g) of this Chapter. The reporting requirements of this Paragraph do not exempt the operator from meeting any National Pollutant Discharge Elimination System (NPDES) reporting requirements.

(3) Surface-water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with Section 774.13 of this Chapter, the regulatory authority may modify the monitoring requirements, except those required by the NPDES permitting authority, including the parameters covered and sampling frequency if the operator demonstrates, using the monitoring data obtained under this Paragraph, that--

(i) The operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and

(ii) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under Section 784.14(i) of this Chapter.

(4) Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of surface water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

(f) Acid-and toxic-forming materials. (1) Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water shall be avoided by--

(i) Identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated, and

(ii) Storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water. Storage shall be limited to the period until burial and/or treatment first become feasible, and so long as storage will not result in any risk of water pollution or other environmental damage.

(2) Storage, burial or treatment practices shall be consistent with other material handling and disposal provisions of this Chapter.

(g) Transfer of wells. Before final release of bond, exploratory or

monitoring wells shall be sealed in a safe and environmentally sound manner in accordance with Sections 817.13 and 817.15. With the prior approval of the regulatory authority, wells may be transferred to another party for further use. However, at a minimum, the conditions of such transfer shall comply with State and local laws and the permittee shall remain responsible for the proper management of the well until bond release in accordance with Sections 817.13-817.15.

(h) Discharges into an underground mine. (1) Discharges into an underground mine are prohibited, unless specifically approved by the regulatory authority after a demonstration that the discharge will--

(i) Minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from underground mining activities;

(ii) Not result in a violation of applicable water quality standards or effluent limitations;

(iii) Be at a known rate and quality which shall meet the effluent limitations of Section 817.42 for pH and total suspended solids, except that the pH and total suspended solids limitations may be exceeded, if approved by the regulatory authority; and

(iv) Meet with the approval of the Mine Safety and Health Administration.

(2) Discharges shall be limited to the following:

(i) Water;

(ii) Coal-processing waste;

(iii) Fly ash from a coal-fired facility;

(iv) Sludge from an acid-mine-drainage treatment facility;

(v) Flue-gas desulfurization sludge;

(vi) Inert materials used for stabilizing underground mines; and

(vii) Underground mine development wastes.

(3) Water from one underground mine may be diverted into other underground workings according to the requirements of this Section.

(i) Gravity discharges from underground mines. (1) Surface entries and accesses to underground workings shall be located and managed to prevent or control gravity discharge of water from the mine. Gravity discharges of water from an underground mine, other than a drift mine subject to Paragraph (i)(2) of this Section, may be allowed by the regulatory authority if it is demonstrated that the untreated or treated discharge complies with the performance standards of this part and any additional NPDES permit requirements.

(2) Notwithstanding anything to the contrary in Paragraph (i)(1) of this Section, the surface entries and accesses of drift mines first used after the implementation of a State, Federal, or Federal Lands Program and located in acid-producing or iron-producing coal seams shall be located in such a manner as to prevent any gravity discharge from the mine.

(j) Drinking, domestic or residential water supply. The permittee must promptly replace any drinking, domestic or residential water supply that is contaminated, diminished or interrupted by underground mining activities conducted after October 24, 1992, if the affected well or spring was in existence before the date the regulatory authority received the permit application for the activities causing the loss, contamination or interruption. The baseline hydrologic information required in Secs. 780.21 and 784.14 of this chapter and the geologic information concerning baseline hydrologic conditions required in Secs. 780.21 and 784.22 of this chapter will be used to determine the impact of mining activities upon the water supply.

Sec. 817.42 Hydrologic balance: Water-quality standards and effluent

Limitations.

FEDERAL REGISTER CITE: 48 FR 43955 (44051)
PUBLISHED DATE: 09/26/83
EFFECTIVE DATE: 10/26/83

Discharges of water from areas disturbed by underground mining activities shall be made in compliance with all applicable State and Federal water quality laws and regulations and with the effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

Sec. 817.43 Diversions.

FEDERAL REGISTER CITE: 48 FR 43955 (43993)
PUBLISHED DATE: 09/26/83
EFFECTIVE DATE: 10/26/83

(a) General requirements. (1) With the approval of the regulatory authority, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria of Section 817.46 for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the regulatory authority in accordance with Section 817.41(h).

(2) The diversion and its appurtenant structures shall be designed, located, constructed, and maintained to--

- (i) Be stable;
- (ii) Provide protection against flooding and resultant damage to life and property;
- (iii) Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and
- (iv) Comply with all applicable local, State, and Federal laws and regulations.

(3) Temporary diversions shall be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored in accordance with this part. Before diversions are removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required. A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat.

(4) The regulatory authority may specify additional design criteria for diversions to meet the requirements of this Section.

(b) Diversion of perennial and intermittent streams.

(1) Diversion of perennial and intermittent streams within the permit area may be approved by the regulatory authority after making the finding relating to stream buffer zones called for in Section 817.57 that the

diversions will not adversely affect the water quantity and quality and related environmental resources of the stream.

(2) The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion.

(3) The requirements of Paragraph (a)(2)(ii) of this Section shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion.

(4) The design and construction of all stream channel diversions of perennial land intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards of this part and any design criteria set by the regulatory authority.

(c) Diversion of miscellaneous flows. (1) Miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the regulatory authority. Miscellaneous flows shall include ground-water discharges and ephemeral streams.

(2) The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the performance standards set forth in Paragraph (a) of this Section.

(3) The requirements of Paragraph (a)(2)(ii) of this Section shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

Sec. 817.45 Hydrologic balance: Sediment control measures.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)

PUBLISHED DATE: 09/30/83

EFFECTIVE DATE: 10/31/83

(a) Appropriate sediment control measures shall be designed, constructed, and maintained using the best technology currently available to:

(1) Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area,

(2) Meet the more stringent of applicable State or Federal effluent limitations,

(3) Minimize erosion to the extent possible.

(b) Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas shall reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include but are not limited to--

(1) Disturbing the smallest practicable area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation as required in Section 817.111(b);

(2) Stabilizing the backfilled material to promote a reduction of the rate and volume of runoff in accordance with the requirements of Section

817.102;

- (3) Retaining sediment within disturbed areas;
- (4) Diverting runoff away from disturbed areas;
- (5) Diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion;
- (6) Using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment;
- (7) Treating with chemicals; and
- (8) Treating mine drainage in underground sumps.

Sec. 817.46 Hydrologic balance: Siltation structures.

FEDERAL REGISTER CITE: 59 FR 53022 (53028)

PUBLISHED DATE: 10/20/94

EFFECTIVE DATE: 11/21/94

(a) For the purposes of this section only, disturbed areas shall not include those areas-

(1) In which the only surface mining activities include diversion ditches, siltation structures, or roads that are designed, constructed and maintained in accordance with this part; and

(2) For which the upstream area is not otherwise distributed by the operator.

(b) General requirements. (1) Additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area shall be prevented to the extent possible using the best technology currently available.

(2) All surface drainage from the disturbed area shall be passed through a siltation structure before leaving the permit area, except as provided in Paragraph (b)(5) or (e) of this Section.

(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 Sec. 784.16(a) of this chapter a qualified registered professional land surveyor, to be constructed as designed and as approved in the reclamation plan.

(4) Any siltation structure which impounds water shall be designed, constructed and maintained in accordance with Section 817.49 of this Chapter.

(5) Siltation structures shall be maintained until removal is authorized by the regulatory authority and the disturbed area has been stabilized and revegetated. In no case shall the structure be removed sooner than 2 years after the last augmented seeding.

(6) When the siltation structure is removed, the land on which the siltation structure was located shall be regraded and revegetated in accordance with the reclamation plan and Sections 817.111-817.116.

Sedimentation ponds approved by the regulatory authority for retention as permanent impoundments may be exempted from this requirement.

(7) Any point-source discharge of water from underground workings to surface waters which does not meet the effluent limitations of Section 817.42 shall be passed through a siltation structure before leaving the permit area.

(c) Sedimentation ponds. (1) Sedimentation ponds, when used, shall--

(i) Be used individually or in series;

(ii) Be located as near as possible to the disturbed area and out of perennial streams unless approved by the regulatory authority; and

(iii) Be designed, constructed, and maintained to--
 (A) Provide adequate sediment storage volume;
 (B) Provide adequate detention time to allow the effluent from the ponds to meet State and Federal effluent limitations;
 (C) Contain or treat the 10-year, 24-hour precipitation event ("design event") unless a lesser design event is approved by the regulatory authority based on terrain, climate, other site-specific conditions and on a demonstration by the operator that the effluent limitations of Section 817.42 will be met;
 (D) Provide a nonclogging dewatering device adequate to maintain the detention time required under Paragraph (c)(1)(iii)(B) of this Section;
 (E) Minimize, to the extent possible, short circuiting;
 (F) Provide periodic sediment removal sufficient to maintain adequate volume for the design event;
 (G) Ensure against excessive settlement;
 (H) Be free of sod, large roots, frozen soil, and acid- or toxic-forming coal-processing waste; and
 (I) Be compacted properly.

(2) Spillways. A sedimentation pond shall include either a combination of principal and emergency spillways or single spillway configured as specified in Sec. 817.49(a)(9).

(d) Other treatment facilities. (1) Other treatment facilities shall be designed to treat the 10-year, 24-hour precipitation even unless a lesser design event is approved by the regulatory authority based on terrain, climate, other site-specific conditions and a demonstration by the operator that the effluent limitations of Section 817.42 will met.

(2) Other treatment facilities shall be designed in accordance with the applicable requirements of Paragraph (c) of this Section.

(e) Exemptions. Exemptions to the requirements of this Section may be granted if--

(1) The disturbed drainage area within the total disturbed area is small; and

(2) The operator demonstrates that siltation structures and alternate sediment control measures are not necessary for drainage from the disturbed drainage areas to meet the effluent limitations under Section 817.42 and the applicable State and Federal water-quality standards for the receiving waters.

Sec. 817.47 Hydrologic balance: Discharge structures.

FEDERAL REGISTER CITE: 44 FR 14902 (15428)

PUBLISHED DATE: 03/13/79

EFFECTIVE DATE: 04/12/79

Discharge from sedimentation ponds, permanent and temporary impoundments, coal processing waste dams and embankments, and diversions shall be controlled, by energy dissipators, riprap channels, and other devices, where necessary, to reduce erosion, to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Discharge structures shall be designed according to standard engineering design procedures.

Sec. 817.49 Impoundments.

FEDERAL REGISTER CITE: 59 FR 53022 (53028)

PUBLISHED DATE: 10/20/94

EFFECTIVE DATE: 11/21/94

(a) General requirements. The requirements of this Paragraph apply to both temporary and permanent impoundments.

(1) Impoundments meeting the Class B or C criteria for dams in the U.S. Department of Agriculture, Soil Conservation Service Technical Release No. 60 (210-VI-TR60, Oct. 1985), "Earth Dams and Reservoirs," shall comply with the, "Minimum Emergency Spillway Hydrologic Criteria," table in TR-60 and the requirements of this section. The technical release is hereby incorporated by reference. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161, order No. PB 87-157509-AS. Copies can be inspected at the OSM Headquarters Office, Office of Surface Mining Reclamation and Enforcement, Administrative Record, Room 660, 800 North Capitol Street, Washington, DC or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

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

(3) Design certification. The design of impoundments shall be certified in accordance with Section 784.16(a) of this Chapter as designed to meet the requirements of this part using current, prudent, engineering practices and any design criteria established by the regulatory authority. The qualified, registered, professional engineer or qualified, registered, professional, land surveyor shall be experienced in the design and construction or impoundments.

(4) Stability. (i) An Impoundment meeting the SCS Class B or C criteria for dams in TR-60, or the size or other criteria of Sec. 77.216(a) of this title 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 included in paragraph (a)(4)(i) of this section, except for a coal mine waste impounding structure, 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 Sec. 784.16(c)(3).

(5) Freeboard. Impoundments shall have adequate freeboard to resist overtopping by waves and by sudden increases in storage volume. Impoundments meeting the SCS Class B or C criteria for dams in TR-60 shall comply with the freeboard hydrograph criteria in the "Minimum Emergency Spillway Hydrologic Criteria" table in TR-60.

(6) 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 SCS Class B or C criteria for dams in TR-60, or the size or other criteria of Sec. 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.

(ii) All vegetative and organic materials shall be removed and foundations excavated and prepared to resist failure. Cutoff trenches shall be installed if necessary to ensure stability.

(7) Slope protection shall be provided to protect against surface erosion at the site and protect against sudden drawdown.

(8) Faces of embankments and surrounding areas shall be vegetated, except that faces where water is impounded may be riprapped or otherwise stabilized in accordance with accepted design practices.

(9) 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 SCS Class B or C criteria for dams in TR-60, the emergency spillway hydrograph criteria in the "Minimum Emergency Spillway Hydrologic Criteria" table in TR-60, or greater event as specified by the regulatory authority.

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

(C) For an impoundment not included in paragraph (a)(9)(ii) (A) and (B) of this section, a 25-year 6-hour event, or greater event as specified by the regulatory authority.

(10) The vertical portion of any remaining highwall shall be located far enough below the low-water line along the full extent of highwall to provide adequate safety and access for the proposed water users.

(11) 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.

(i) Inspections shall be made regularly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond.

(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.

(iii) A copy of the report shall be retained at or near the minesite.

(iv) In any State which authorizes land surveyors to prepare and certify plans in accordance with Sec. 784.16(a) of this chapter, a qualified registered professional land surveyor may inspect any temporary or permanent impoundment that does not meet the SCS Class B or C criteria for dams in TR-60, or the size or other criteria of Sec. 77.216(a) of this title and certify and submit the report required by paragraph (a)(11)(ii) of this section, except that all coal mine waste impounding structures covered by Sec.

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.

(12) Impoundments meeting the SCS Class B or C criteria for dams in TR-60, or the size or other criteria of Sec. 77.216 of this title must be examined in accordance with Sec. 77.216-3 of this title. Impoundments not meeting the SCS Class B or C Criteria for dams in TR-60, or subject to Sec. 77.216 of this title, shall be examined at least quarterly. A qualified person designated by the operator shall examine impoundments for the appearance of structural weakness and other hazardous conditions.

(13) Emergency procedures. If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment shall promptly inform the regulatory authority of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the regulatory authority shall be notified immediately. The regulatory authority shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

(b) Permanent impoundments. A permanent impoundment of water may be created, if authorized by the regulatory authority in the approved permit based upon the following demonstration:

(1) The size and configuration of such impoundment will be adequate for its intended purposes.

(2) The quality of impounded water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable State and Federal water quality standards, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable State and Federal water quality standards.

(3) The water level will be sufficiently stable and be capable of supporting the intended use.

(4) Final grading will provide for adequate safety and access for proposed water users.

(5) The impoundment will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.

(6) The impoundment will be suitable for the approved postmining land use.

(c) Temporary impoundments. (1) The regulatory authority may authorize the construction of temporary impoundments as part of underground mining activities.

(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 Sec. 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) Impoundments meeting the SCS Class B or C criteria for dams in TR-60, or the size or other criteria of Sec. 77.216(a) of this title shall be designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event specified by the regulatory authority.

(ii) Impoundments not included in paragraph (c)(2)(i) of this section shall be designed to control the precipitation of the 100-year 6-hour event,

or greater event specified by the regulatory authority.

Sec. 817.56 Postmining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities.

FEDERAL REGISTER CITE: 48 FR 43955 (44006)
PUBLISHED DATE: 09/26/83
EFFECTIVE DATE: 10/26/83

Before abandoning a permit area or seeking bond release, the operator shall ensure that all temporary structures are removed and reclaimed, and that all permanent sedimentation ponds, diversions, impoundments, and treatment facilities meet the requirements of this Chapter for permanent structures, have been maintained properly and meet the requirements of the approved reclamation plan for permanent structures and impoundments. The operator shall renovate such structures if necessary to meet the requirements of this Chapter and to conform to the approved reclamation plan.

Sec. 817.57 Hydrologic balance: Stream buffer zones.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)
PUBLISHED DATE: 09/30/83
EFFECTIVE DATE: 10/31/83

(a) No land within 100 feet of a perennial stream or an intermittent stream shall be disturbed by underground mining activities, unless the regulatory authority specifically authorizes underground mining activities closer to, or through, such a stream. The regulatory authority may authorize such activities only upon finding that--

(1) Underground mining activities will not cause or contribute to the violation of applicable State or Federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of the stream; and

(2) If there will be a temporary or permanent stream-channel diversion, it will comply with Section 817.43.

(b) The area not to be disturbed shall be designated as a buffer zone, and operator shall mark it as specified in Section 817.11.

Sec. 817.59 Coal recovery.

FEDERAL REGISTER CITE: 44 FR 14902 (15430)
PUBLISHED DATE: 03/13/79
EFFECTIVE DATE: 04/12/79

Underground mining activities shall be conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that re-affecting the land in the future through surface coal mining operations is minimized.

Sec. 817.61 Use of explosives: General requirements.

FEDERAL REGISTER CITE: 51 FR 19444 (19461)
PUBLISHED DATE: 05/29/86
EFFECTIVE DATE: 06/30/86

(a) Sections 817.61-817.68 apply to surface blasting activities incident to

underground coal mining, including, but not limited to, initial rounds of slopes and shafts.

(b) Each operator shall comply with all applicable State and Federal laws and regulations in the use of explosives.

(c) Blasters. (1) No later than 12 months after the blaster certification program for a State required by Part 850 of this Chapter has been approved under the procedures of Subchapter C of this Chapter, all surface blasting operations incident to underground mining in that State shall be conducted under the direction of a certified blaster. Before that time, all such blasting operations in that State shall be conducted by competent, experienced persons who understand the hazards involved.

(2) Certificates of blaster certification shall be carried by blasters or shall be on file at the permit area during blasting operations.

(3) A blaster and at least one other person shall be present at the firing of a blast.

(4) Any blaster who is responsible for conducting blasting operations at a blasting site shall:

(i) Be familiar with the site-specific performance standards; and

(ii) Give direction and on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

(d) Blast design. (1) An anticipated blast design shall be submitted if blasting operations will be conducted within--

(i) 1,000 feet of any building used as a dwelling, public building, school, church or community or institutional building; or

(ii) 500 feet of active or abandoned underground mines.

(2) The blast design may be presented as part of a permit application or at a time, before the blast, approved by the regulatory authority.

(3) The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable airblast, flyrock, and ground-vibration standards in Section 817.67.

(4) The blast design shall be prepared and signed by a certified blaster.

(5) The regulatory authority may require changes to the design submitted.

Sec. 817.62 Use of explosives: Preblasting survey.

FEDERAL REGISTER CITE: 48 FR 9788 (9809)

PUBLISHED DATE: 03/08/83

EFFECTIVE DATE: 04/07/83

(a) At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within 1/2 mile of the permit area how to request a preblasting survey.

(b) A resident or owner of a dwelling or structure within 1/2 mile of any part of the permit area may request a preblasting survey. This request shall be made, in writing, directly to the operator or to the regulatory authority, who shall promptly notify the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or

owner.

(c) The operator shall determine the condition of the dwelling or structure and shall document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, and transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

(d) The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be promptly provided to the regulatory authority and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the operator and the regulatory authority a detailed description of the specific areas of disagreement.

(e) Any surveys requested more than 10 days before the planned initiation of blasting shall be completed by the operator before the initiation of blasting.

Sec. 817.64 Use of explosives: General performance standards.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)

PUBLISHED DATE: 09/30/83

EFFECTIVE DATE: 10/31/83

(a) The operator shall notify, in writing, residents within 1/2 mile of the blasting site and local governments of the proposed times and locations of blasting operations. Such notice of times that blasting is to be conducted may be announced weekly, but in no case less than 24 hours before blasting will occur.

(b) Unscheduled blasts may be conducted only where public or operator health and safety so require and for emergency blasting actions. When an operator conducts an unscheduled surface blast incidental to underground coal mining operations, the operator, using audible signals, shall notify residents within 1/2 mile of the blasting site and document the reason in accordance with Section 817.68(p).

(c) All blasting shall be conducted between sunrise and sunset unless nighttime blasting is approved by the regulatory authority based upon a showing by the operator that the public will be protected from adverse noise and other impacts. The regulatory authority may specify more restrictive time periods for blasting.

Sec. 817.66 Use of explosives: Blasting signs, warnings, and access control.

FEDERAL REGISTER CITE: 48 FR 9788 (9810)

PUBLISHED DATE: 03/08/83

EFFECTIVE DATE: 04/07/83

(a) Blasting signs. Blasting signs shall meet the specifications of Section 817.11. The operator shall--

(1) Conspicuously place signs reading "Blasting Area" along the edge of any blasting area that comes within 100 feet of any public-road right-of-way, and at the point where any other road provides access to the blasting area; and

(2) At all entrances to the permit area from public roads or highways, place conspicuous signs which state "Warning! Explosives in Use," which clearly list and describe the meaning of the audible blast warning and

all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.

(b) Warnings. Warning and all-clear signals of different character or pattern that are audible within a range of 1/2 mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within 1/2 mile of the permit area shall be notified of the meaning of the signals in the blasting notification required in Section 817.64(a).

(c) Access control. Access within the blasting areas shall be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that--

(1) No unusual hazards, such as imminent slides or undetonated charges, exist; and

(2) Access to and travel within the blasting area can be safely resumed.

Sec. 817.67 Use of explosives: Control of adverse effects.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)

PUBLISHED DATE: 09/30/83

EFFECTIVE DATE: 10/31/83

(a) General requirements. Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

(b) Airblast. (1) Limits. (i) Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area, except as provided in Paragraph (e) of this Section.

Lower frequency limit of measuring system, in Hz (+/- 3 dB)	Maximum level, in dB
0.1 Hz or lower--flat response ¹	134 peak.
2 Hz or lower--flat response	133 peak.
6 Hz or lower--flat response	129 peak.
C-weighted--slow response n1	105 peak dBC.

1 Only when approved by the regulatory authority.

(ii) If necessary to prevent damage, the regulatory authority may specify lower maximum allowable airblast levels than those of Paragraph (b)(1) (i) of this Section for use in the vicinity of a specific blasting operation.

(2) Monitoring. (i) The operator shall conduct periodic monitoring to ensure compliance with the airblast standards. The regulatory authority may require airblast measurement of any or all blasts and may specify the locations at which such measurements are taken.

(ii) The measuring systems used shall have an upper-end flat-frequency response of at least 200 Hz.

(c) Flyrock. Flyrock travelling in the air or along the ground shall not be cast from the blasting site--

(1) More than one-half the distance to the nearest dwelling or other occupied structure;

(2) Beyond the area of control required under Section 817.66(c); or

(3) Beyond the permit boundary.

(d) Ground vibration. (1) General. In all blasting operations, except as otherwise authorized in Paragraph (e) of this Section, the maximum ground vibration shall not exceed the values approved by the regulatory authority. The maximum ground vibration for protected structures listed in Paragraph (d)(2)(i) of this Section shall be established in accordance with either the maximum peak-particle-velocity limits of Paragraph (d)(2), the scaled-distance equation of Paragraph (d)(3), the blasting-level chart of Paragraph (d)(4), or by the regulatory authority under Paragraph (d)(5) of this Section. All structures in the vicinity of the blasting area not listed in Paragraph (d)(2)(i) of this Section, such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator and approved by the regulatory authority before the initiation of blasting.

(2) Maximum peak-particle velocity. (i) The maximum ground vibration shall not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area:

Distance (D) from the blasting site, in feet	Maximum allowable peak particle velocity (V max) for ground vibration, in inches/ second ¹	Scaled- distance factor to be applied without seismic monitoring ² (Ds)
0 to 300	1.25	50
301 to 5,000	1.00	55
5,001 and beyond	0.75	65

1 Ground vibration shall be measured as the particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements.

2 Applicable to the scaled-distance equation of Paragraph (d)(3)(i) of this Section.

(ii) A seismographic record shall be provided for each blast.

(3) Scaled-distance equation. (i) An operator may use the scaled-distance equation, $W = (D/D_s)^2$, to determine the allowable charge weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring; where W= the maximum weight of explosives, in pounds; D = the distance, in feet, from the blasting site to the nearest protected structure; and D_s = the scaled-distance factor, which may initially be approved by the regulatory authority using the values for scaled-distance factor listed in Paragraph (d)(2)(i) of this Section.

(ii) The development of a modified scaled-distance factor may be authorized by the regulatory authority on receipt of a written request by the operator, supported by seismographic records of blasting at the minesite. The modified scaled-distance factor shall be determined such that the particle velocity of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity of Paragraph (d)(2)(i) of this Section, at a 95-percent confidence level.

(4) Blasting-level chart. (i) An operator may use the ground-vibration limits in Figure 1 to determine the maximum allowable ground vibration.

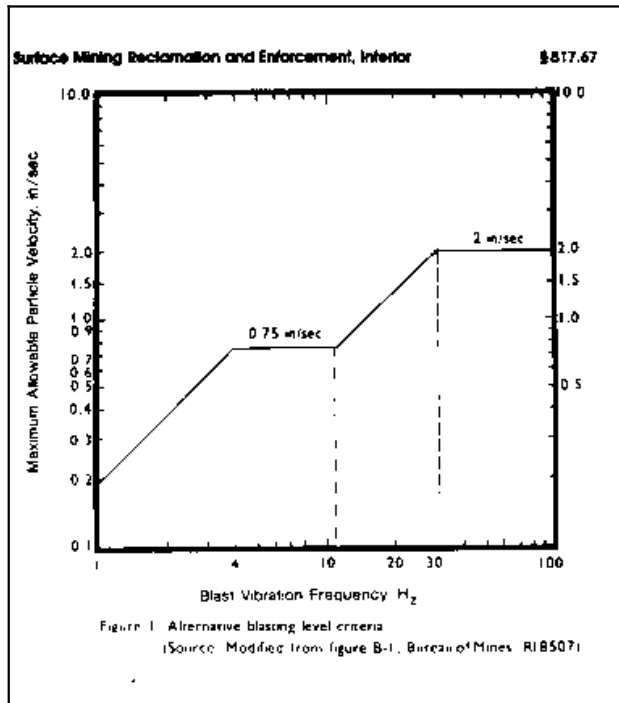


Figure 1. Alternative blasting level criteria.
(Source: Modified from figure B-1,
Bureau of Mines R18507)

(ii) If the Figure 1 limits are used, a seismographic record including both particle velocity and vibration-frequency levels shall be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records shall be approved by the regulatory authority before application on this alternative blasting criterion.

(5) The maximum allowable ground vibration shall be reduced by the regulatory authority beyond the limits otherwise provided by this Section, if determined necessary to provide damage protection.

(6) The regulatory authority may require an operator to conduct seismic monitoring of any or all blasts and may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

(e) The maximum airblast and ground-vibration standards of Paragraphs (b) and (d) of this Section shall not apply at the following locations:

(1) At structures owned by the permittee and not leased to another person,

(2) At structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the regulatory authority before blasting.

Sec. 817.68 Use of explosives: Records of blasting operations.

FEDERAL REGISTER CITE: 48 FR 9788 (9811)

PUBLISHED DATE: 03/08/83

EFFECTIVE DATE: 04/07/83

The operator shall retain a record of all blasts for at least 3 years.

Upon request, copies of these records shall be made available to the regulatory authority and to the public for inspection. Such records shall contain the following data:

- (a) Name of the operator conducting the blast.
- (b) Location, date, and time of the blast.
- (c) Name, signature, and certification number of the blaster conducting the blast.
- (d) Identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community, or institutional building outside the permit area, except those described in Section 817.67(e).
- (e) Weather conditions, including those which may cause possible adverse blasting effects.
- (f) Type of material blasted.
- (g) Sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern.
- (h) Diameter and depth of holes.
- (i) Types of explosives used.
- (j) Total weight of explosives used per hole.
- (k) The maximum weight of explosives detonated in an 8-millisecond period.
- (l) Initiation system.
- (m) Type and length of stemming.
- (n) Mats or other protections used.
- (o) Seismographic and airblast records, if required, which shall include--
 - (1) Type of instrument, sensitivity, and calibration signal or certification of annual calibration;
 - (2) Exact location of instrument and the date, time, and distance from the blast;
 - (3) Name of the person and firm taking the reading;
 - (4) Name of the person and firm analyzing the seismographic record; and
 - (5) The vibration and/or airblast level recorded.
- (p) Reasons and conditions for each unscheduled blast.

Sec. 817.71 Disposal of excess spoil: General requirements.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)

PUBLISHED DATE: 09/30/83

EFFECTIVE DATE: 10/31/83

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

- (1) Minimize the adverse effects of leachate and surfacewater runoff from the fill on surface and ground waters;
- (2) Ensure mass stability and prevent mass movement during and after construction; and
- (3) Ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

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

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

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

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

(2) When the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the regulatory authority based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to ensure stability of the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed in accordance with Section 784.19 of this Chapter to determine the size of rock toe buttresses and keyway cuts.

(e) Placement of excess spoil. (1) All vegetative and organic materials shall be removed from the disposal area prior to placement of excess spoil. Topsoil shall be removed, segregated and stored and redistributed in accordance with Section 817.22. If approved by the regulatory authority, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

(2) Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding 4 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material in accordance with Section 817.22 of this Chapter. The regulatory authority may approve a design which incorporates placement of excess spoil in horizontal lifts other than 4 feet in thickness when it is demonstrated by the operator and certified by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.

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

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

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

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

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

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

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

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

(1) Such inspections shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include at a minimum:

(i) Foundation preparation, including the removal of all organic material and topsoil;

(ii) Placement of underdrains and protective filter systems;

(iii) Installation of final surface drainage systems; and

(iv) The final graded and revegetated fill. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials.

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

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

(ii) Where excess durable rock spoil is placed in single or multiple lifts such that the underdrain system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, in accordance with Section 817.73, color photographs shall be taken of the underdrain as the underdrain system is being formed.

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

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

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

(1) Placed in accordance with Section 817.83;

(2) Nontoxic and nonacid forming; and

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

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

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

Sec. 817.72 Disposal of excess spoil: Valley fills/head-of-hollow fills.

FEDERAL REGISTER CITE: 48 FR 32909 (32928)

PUBLISHED DATE: 07/19/83

EFFECTIVE DATE: 08/18/83

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

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

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

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

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

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

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

1-percent slope toward the rock core.

Sec. 817.73 Disposal of excess spoil: Durable rock fills.

FEDERAL REGISTER CITE: 48 FR 32909 (32929)

PUBLISHED DATE: 07/19/83

EFFECTIVE DATE: 08/18/83

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

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

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

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

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

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

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

Sec. 817.74 Disposal of excess spoil: Preexisting benches.

FEDERAL REGISTER CITE: 56 FR 65612 (65635)

PUBLISHED DATE: 12/17/91

EFFECTIVE DATE: 01/16/92

(a) The regulatory authority may approve the disposal of excess spoil through placement on a preexisting bench if the affected portion of the preexisting bench is permitted and the standards set forth in Sec. 817.102 (c), (e) through (h), and (j), and the requirements of this section are met.

(b) All vegetation and organic materials shall be removed from the affected portion of the preexisting bench prior to placement of the excess spoil. Any available topsoil on the bench shall be removed, stored and redistributed in accordance with Sec. 817.22 of this part. Substitute or supplemental materials may be used in accordance with Sec. 817.22(b) of this part.

(c) The fill shall be designed and constructed using current, prudent engineering practices. The design will be certified by a registered professional engineer. The spoil shall be placed on the solid portion of the bench in a controlled manner and concurrently compacted as necessary to attain

a long term static safety factor of 1.3 for all portions of the fill. Any spoil deposited on any fill portion of the bench will be treated as excess spoil fill under Sec. 817.71.

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

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

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

(3) Minimize erosion and water pollution both on and off the site; and

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

(e) All disturbed areas, including diversion channels that are not ripped or otherwise protected, shall be revegetated upon completion of construction.

(f) Permanent impoundments may not be constructed on preexisting benches backfilled with excess spoil under this regulation.

(g) Final configuration of the backfill must be compatible with the natural drainage patterns and the surrounding area, and support the approved postmining landuse.

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

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

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

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

(4) Excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity-transport courses properly prepared according to Section 817.22. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity-transport course between the two benches and each transport course shall be reclaimed in accordance with the requirements of this part.

Sec. 817.81 Coal mine waste: General requirements.

FEDERAL REGISTER CITE: 56 FR 65612 (65635)

PUBLISHED DATE: 12/17/91

EFFECTIVE DATE: 01/16/92

(a) General. All coal mine waste disposed of in an area other than the mine

workings or excavations shall be placed in new or existing disposal areas within a permit area, which are approved by the regulatory authority for this purpose. Coal mine waste shall be hauled or conveyed and placed for final placement in a controlled manner to --

(1) Minimize adverse effects of leachate and surface-water runoff on surface- and ground-water quality and quantity;

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

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

(4) Not create a public hazard; and

(5) Prevent combustion.

(b) Coal mine waste materials from activities located outside a permit area may be disposed of in the permit area only if approved by the regulatory authority. Approval shall be based upon a showing that such disposal will be in accordance with the standards of this Section.

(c) Design certification. (1) The disposal facility shall be designed using current, prudent engineering practices and shall meet any design criteria established by the regulatory authority. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall certify the design of the disposal facility.

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

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

(e) Emergency procedures. If any examination or inspection discloses that a potential hazard exists, the regulatory authority shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented the regulatory authority shall be notified immediately. The regulatory authority shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

(f) Underground disposal. Coal mine waste may be disposed of in underground mine workings, but only in accordance with a plan approved by the regulatory authority and MSHA under Section 784.25 of this Chapter.

Sec. 817.83 Coal mine waste: Refuse piles.

FEDERAL REGISTER CITE: 51 FR 41952 (41960)

PUBLISHED DATE: 11/20/86

EFFECTIVE DATE: 12/20/86

Refuse piles shall meet the requirements of Section 817.81, the additional requirements of this Section, and the requirements of Sections 77.214 and 77.215 of this title.

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

(2) Uncontrolled surface drainage may not be diverted over the outslope

of the refuse pile. Runoff from areas above the refuse pile and runoff from the surface of the refuse pile shall be diverted into stabilized diversion channels designed to meet the requirements of Section 817.43 to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff diverted from undisturbed areas need not be commingled with runoff from the surface of the refuse pile.

(3) Underdrains shall comply with the requirements of Section 817.71(f) (3).

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

(c) Placement. (1) All vegetative and organic materials shall be removed from the disposal area prior to placement of coal mine waste. Topsoil shall be removed, segregated and stored or redistributed in accordance with Section 817.22. If approved by the regulatory authority, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

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

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

(4) Following final grading of the refuse pile, the coal mine waste shall be covered with a minimum of 4 feet of the best available, nontoxic and noncombustible material, in a manner that does not impede drainage from the underdrains. The regulatory authority may allow less than 4 feet of cover material based on physical and chemical analyses which show that the requirements of Sections 817.111-817.116 will be met.

(d) Inspections. A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, shall inspect the refuse pile during construction. The professional engineer or specialist shall be experienced in the construction of similar earth and waste structures.

(1) Such inspection shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include, at a minimum:

(i) Foundation preparation including the removal of all organic material and topsoil;

(ii) Placement of underdrains and protective filter systems;

(iii) Installation of final surface drainage systems; and

(iv) The final graded and revegetated facility. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of coal mine waste materials. More frequent inspections shall be conducted if a danger of harm exists to the public health and safety or the environment. Inspections shall continue until the refuse pile has been finally graded and revegetated or until a later time as required by the regulatory authority.

(2) The qualified registered professional engineer shall provide a certified report to the regulatory authority promptly after each inspection

that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and this Chapter. The report shall include appearances of instability, structural weakness, and other hazardous conditions.

(3) The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with coal mine waste. If the underdrain system is constructed in phases, each phase shall be certified separately. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site.

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

Sec. 817.84 Coal mine waste: Impounding structures.

FEDERAL REGISTER CITE: 53 FR 43584 (43606)

PUBLISHED DATE: 10/27/88

EFFECTIVE DATE: 11/28/88

New and existing impounding structures constructed of coal mine waste or intended to impound coal mine waste shall meet the requirements of Section 817.81.

(a) Coal mine waste shall not be used for construction of impounding structures unless it has been demonstrated to the regulatory authority that the stability of such a structure conforms to the requirements of this part and that the use of coal mine waste will not have a detrimental effect on downstream water quality or the environment due to acid seepage through the impounding structure. The stability of the structure and the potential impact of acid mine seepage through the impounding structure shall be discussed in detail in the design plan submitted to the regulatory authority in accordance with Section 780.25 of this Chapter.

(b)(1) Each impounding structure constructed of coal mine waste or intended to impound coal mine waste shall be designed, constructed, and maintained in accordance with Section 817.49 (a) and (c). Such structures may not be retained permanently as part of the approved postmining land use.

(2) Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of Sec. 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.

(c) Spillways and outlet works shall be designed to provide adequate protection against erosion and corrosion. Inlets shall be protected against blockage.

(d) Drainage control. Runoff from areas above the disposal facility or runoff from the surface of the facility that may cause instability or erosion of the impounding structure shall be diverted into a stabilized diversion channels designed to meet the requirements of Section 817.43 and designed to safely pass the runoff from a 100-year, 6-hour design precipitation event.

(e) Impounding structures constructed of or impounding coal mine waste 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.

(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.

Sec. 817.87 Coal mine waste: Burning and burned waste utilization.

FEDERAL REGISTER CITE: 48 FR 43955 (44031)
PUBLISHED DATE: 09/26/83
EFFECTIVE DATE: 10/26/83

(a) Coal mine waste fires shall be extinguished by the person who conducts the surface mining activities, in accordance with a plan approved by the regulatory authority and the Mine Safety and Health Administration. The plan shall contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, shall be involved in the extinguishing operations.

(b) No burning or unburned coal mine waste shall be removed from a permitted disposal area without a removal plan approved by the regulatory authority. Consideration shall be given to potential hazards to persons working or living in the vicinity of the structure.

Sec. 817.89 Disposal of noncoal mine wastes.

FEDERAL REGISTER CITE: 56 FR 65612 (65635)
PUBLISHED DATE: 12/17/91
EFFECTIVE DATE: 01/16/92

(a) Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities shall be placed and stored in a controlled manner in a designated portion of the permit area. Placement and storage shall ensure that leachate and surface runoff do not degrade surface or ground water, that fires are prevented, and that the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings.

(b) Final disposal of noncoal mine wastes shall be in a designated disposal site in the permit area or a State-approved solid waste disposal area. Disposal sites in the permit area shall be designed and constructed to ensure that leachate and drainage from the noncoal mine waste area does not degrade surface or underground water. Wastes shall be routinely compacted and covered to prevent combustion and windborne waste. When the disposal is completed, a minimum of 2 feet of soil cover shall be placed over the site, slopes stabilized, and revegetation accomplished in accordance with Sections 817.111-817.116. Operation of the disposal site shall be conducted in accordance with all local, State, and Federal requirements.

(c) At no time shall any noncoal mine waste be deposited in a refuse pile or impounding structure, nor shall any excavation for a noncoal mine waste disposal site be located within 8 feet of any coal outcrop or coal storage area.

Sec. 817.95 Stabilization of surface areas.

FEDERAL REGISTER CITE: 48 FR 1159 (1163)
PUBLISHED DATE: 01/10/83
EFFECTIVE DATE: 01/10/83

(a) All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion.

(b) Rills and gullies which form in areas that have been regraded and topsoiled and which either--

(1) Disrupt the approved postmining land use or the reestablishment of the vegetative cover, or

(2) Cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

Sec. 817.97 Protection of fish, wildlife, and related environmental values.

FEDERAL REGISTER CITE: 52 FR 47352 (47359)

PUBLISHED DATE: 12/11/87

EFFECTIVE DATE: 01/11/88

(a) The operator shall, to the extent possible using the best technology currently available, minimize disturbances and adverse impacts on fish, wildlife, and related environmental values and shall achieve enhancement of such resources where practicable.

(b) Endangered and threatened species. No underground mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary or which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The operator shall promptly report to the regulatory authority any State- or federally-listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the regulatory authority shall consult with appropriate State and Federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

(c) Bald and golden eagles. No underground mining activity shall be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. The operator shall promptly report to the regulatory authority any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the regulatory authority shall consult with the U.S. Fish and Wildlife Service and also, where appropriate, the State fish and wildlife agency and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

(d) Nothing in this Chapter shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

(e) Each operator shall, to the extent possible using the best technology currently available--

(1) Ensure that electric powerlines and other transmission facilities used for, or incidental to, underground mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the regulatory authority determines that such requirements are unnecessary;

(2) Locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law;

(3) Design fences, overland conveyors, and other potential barriers to permit passage for large mammals except where the regulatory authority

determines that such requirements are unnecessary; and

(4) Fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

(f) Wetlands and habitats of unusually high value for fish and wildlife. The operator conducting underground mining activities shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Underground mining activities shall avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

(g) Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas shall be selected on the basis of the following criteria:

(1) Their proven nutritional value for fish or wildlife.

(2) Their use as cover for fish or wildlife.

(3) Their ability to support and enhance fish or wildlife habitat after the release of performance bonds. The selected plants shall be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

(h) Where cropland is to be the postmining land use, and where appropriate for wildlife- and crop-management practices, the operator shall intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals.

(i) Where residential, public service, or industrial uses are to be the postmining land use and where consistent with the approved postmining land use, the operator shall intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

Sec. 817.99 Slides and other damage.

FEDERAL REGISTER CITE: 44 FR 14902 (15437)

PUBLISHED DATE: 03/13/79

EFFECTIVE DATE: 04/12/79

At any time a slide occurs which may have a potential adverse effect on public, property, health, safety, or the environment, the person who conducts the underground mining activities shall notify the regulatory authority by the fastest available means and comply with any remedial measures required by the regulatory authority.

Sec. 817.100 Contemporaneous reclamation.

FEDERAL REGISTER CITE: 48 FR 24637 (24652)

PUBLISHED DATE: 06/01/83

EFFECTIVE DATE: 07/01/83

Reclamation efforts, including but not limited to backfilling, grading, topsoil replacement, and revegetation, on all areas affected by surface impacts incident to an underground coal mine shall occur as contemporaneously as practicable with mining operations, except when such mining operations are conducted in accordance with a variance for concurrent surface and underground mining activities issued under Section 785.18 of this Chapter. The regulatory authority may establish schedules that define contemporaneous reclamation.

Sec. 817.102 Backfilling and grading: General requirements.

FEDERAL REGISTER CITE: 48 FR 41719 (41735)
PUBLISHED DATE: 09/16/83
EFFECTIVE DATE: 10/17/83

(a) Disturbed areas shall be backfilled and graded to--

(1) Achieve the approximate original contour, except as provided in Paragraph(k) of this Section.

(2) Eliminate all highwalls, spoil piles, and depressions, except as provided in Paragraph (h) (small depressions) and in Paragraph (k)(2) (previously mined highwalls) of this Section;

(3) Achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides;

(4) Minimize erosion and water pollution both on and off the site; and

(5) Support the approved postmining land use.

(b) Spoil, except as provided in Paragraph (1) of this Section, and except excess spoil disposed of in accordance with Sections 817.71-817.74, shall be returned to the mined-out surface area.

(c) Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials.

(d) Spoil may be placed on the area outside the mined-out surface area in nonsteep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met:

(1) All vegetative and organic materials shall be removed from the area.

(2) The topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with Section 817.22.

(3) The spoil shall be backfilled and graded on the area in accordance with the requirements of this Section.

(e) Disposal of coal processing waste and underground development waste in the mined-out surface area shall be in accordance with Sections 817.81 and 817.83, except that a long-term static safety factor of 1.3 shall be achieved.

(f) Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining shall be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water in accordance with Section 817.41, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

(g) Cut-and-fill terraces may be allowed by the regulatory authority where--

(1) Needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or

(2) Specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land-use plan.

(h) Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

(i) Permanent impoundments may be approved if they meet the requirements of Sections 817.49 and 817.56 and if they are suitable for the approved postmining land use.

(j) Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion and provides a surface for replacement of topsoil that will minimize slippage.

(k) The postmining slope may vary from the approximate original contour when approval is obtained from the regulatory authority for--

(1) A variance from approximate original contour requirements in accordance with Section 785.16 of this Chapter; or

(2) Incomplete elimination of highwalls in previously mined areas in accordance with Section 817.106.

(l) Regrading of settled and revegetated fills to achieve approximate original contour at the conclusion of underground mining activities shall not be required if the conditions of Paragraph (1)(1) or (1)(2) of this Section are met.

(1)(i) Settled and revegetated fills shall be composed of spoil or nonacid- or nontoxic-forming underground development waste.

(ii) The spoil or underground development waste shall not be located so as to be detrimental to the environment, to the health and safety of the public, or to the approved postmining land use.

(iii) Stability of the spoil or underground development waste shall be demonstrated through standard geotechnical analysis to be consistent with backfilling and grading requirements for material on the solid bench (1.3 static safety factor) or excess spoil requirements for material not placed on a solid bench (1.5 static safety factor).

(iv) The surface of the spoil or underground development waste shall be vegetated according to Section 817.116, and surface runoff shall be controlled in accordance with Section 817.43.

(2) If it is determined by the regulatory authority that disturbance of the existing spoil or underground development waste would increase environmental harm or adversely affect the health and safety of the public, the regulatory authority may allow the existing spoil or underground development waste pile to remain in place. The regulatory authority may require stabilization of such spoil or underground development waste in accordance with the requirements of Paragraphs (1)(1)(i)-(1)(1)(iv) of this Section.

Sec. 817.106 Backfilling and grading: Previously mined areas.

FEDERAL REGISTER CITE: 51 FR 41734 (41737)

PUBLISHED DATE: 11/18/86

EFFECTIVE DATE: 12/18/86

(a) Remining operations on previously mined areas that contain a preexisting highwall shall comply with the requirements of Sections 817.102-817.107, except as provided in this Section.

(b) The requirements of Section 817.102 (a)(1) and (a)(2) requiring that elimination of highwalls shall not apply to remining operations where the volume of all reasonably available spoil is demonstrated in writing to the regulatory authority to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

(1) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remining operation shall be included within the permit area.

(2) The backfill shall be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.

(3) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The operator shall

demonstrate, to the satisfaction of the regulatory authority, that the highwall remnant is stable.

(4) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

Sec. 817.107 Backfilling and grading: Steep slopes.

FEDERAL REGISTER CITE: 48 FR 41719 (41735)

PUBLISHED DATE: 09/16/83

EFFECTIVE DATE: 10/17/83

(a) Underground mining activities on steep slopes shall be conducted so as to meet the requirements of Sections 817.102-817.106 and the requirements of this Section.

(b) The following materials shall not be placed on the downslope:

- (1) Spoil.
- (2) Waste materials of any type.
- (3) Debris, including that from clearing and grubbing.
- (4) Abandoned or disabled equipment.

(c) Land above the highwall shall not be disturbed unless the regulatory authority finds that this disturbance will facilitate compliance with the environmental protection standards of this Subchapter and the disturbance is limited to that necessary to facilitate compliance.

(b) Woody materials shall not be buried in the backfilled area unless the regulatory authority determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

Sec. 817.111 Revegetation: General requirements.

FEDERAL REGISTER CITE: 48 FR 40139 (40161)

PUBLISHED DATE: 09/02/83

EFFECTIVE DATE: 10/03/83

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

- (1) Diverse, effective, and permanent;
- (2) Comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the regulatory authority;
- (3) At least equal in extent of cover to the natural vegetation of the area; and
- (4) Capable of stabilizing the soil surface from erosion.

(b) The reestablished plant species shall--

- (1) Be compatible with the approved postmining land use;
- (2) Have the same seasonal characteristics of growth as the original vegetation;
- (3) Be capable of self-regeneration and plant succession;
- (4) Be compatible with the plant and animal species of the area; and
- (5) Meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

(c) The regulatory authority may grant exception to the requirements of

Paragraphs (b)(2) and (b)(3) of this Section when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

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

Sec. 817.113 Revegetation: Timing.

FEDERAL REGISTER CITE: 48 FR 40139 (40161)

PUBLISHED DATE: 09/02/83

EFFECTIVE DATE: 10/03/83

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

Sec. 817.114 Revegetation: Mulching and other soil stabilizing practices.

FEDERAL REGISTER CITE: 48 FR 40139 (40161)

PUBLISHED DATE: 09/02/83

EFFECTIVE DATE: 10/03/83

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

Sec. 817.116 Revegetation: Standards for success.

FEDERAL REGISTER CITE: 60 FR 58480 (58491)

PUBLISHED DATE: 11/27/95

EFFECTIVE DATE: 12/27/95

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

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

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

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

(1) For areas developed for use as grazing land or pasture land, the

ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the regulatory authority.

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

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

(i) Minimum stocking and planting arrangements shall be specified by the regulatory authority on the basis of local and regional conditions and after consultation with and approval by the State agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may occur on either a programwide or a permit-specific basis.

(ii) Trees and shrubs that will be used in determining the success of stocking and the adequacy of the plant arrangement shall have utility for the approved postmining land use. Trees and shrubs counted in determining such success shall be healthy and have been in place for not less than two growing seasons. At the time of bond release, at least 80 percent of the trees and shrubs used to determine such success shall have been in place for 60 percent of the applicable minimum period of responsibility.

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

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

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

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

(2) In areas of more than 26.0 inches of annual average precipitation, the period of responsibility shall continue for a period of not less than:

(i) Five full years, except as provided in paragraph (c)(2)(ii) of this section. The vegetation parameters identified in paragraph (b) of this section for grazing land, pasture land, or cropland shall equal or exceed the approved success standard during the growing season of any 2 years of the responsibility period, except the first year. Areas approved for the other uses identified in paragraph (b) of this section shall equal or exceed the applicable success standard during the growing season of the last year of the responsibility period.

(ii) Two full years for lands eligible for remining included in permits issued before September 30, 2004, or any renewals thereof. To the extent that the success standards are established by paragraph (b)(5) of this section, the lands shall equal or exceed the standards during the growing season of the last year of the responsibility period.

(3) In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than:

(i) Ten full years, except as provided in paragraph (c)(3)(ii) of this section. Vegetation parameters identified in paragraph (b) of this section shall equal or exceed the approved success standard for at least the

last two consecutive years of the responsibility period.

(ii) Five full years for lands eligible for re-mining included in permits issued before September 30, 2004, or any renewals thereof. To the extent that the success standards are established by paragraph (b)(5) of this section, the lands shall equal or exceed the standards during the growing seasons of the last two consecutive years of the responsibility period.

(4) The regulatory authority may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, provided it obtains prior approval from the Director in accordance with Sec. 732.17 of this chapter that the practices are normal husbandry practices, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal husbandry practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding, and transplanting specifically necessitated by such actions.

Sec. 817.121 Subsidence control.

FEDERAL REGISTER CITE: 60 FR 16722 (16749)

PUBLISHED DATE: 03/31/95

EFFECTIVE DATE: 05/01/95

(a) Measures to prevent or minimize damage. (1) The permittee must either adopt measures consistent with known technology that prevent subsidence from causing material damage to the extent technologically and economically feasible, maximize mine stability, and maintain the value and reasonably foreseeable use of surface lands or adopt mining technology that provides for planned subsidence in a predictable and controlled manner.

(2) If a permittee employs mining technology that provides for planned subsidence in a predictable and controlled manner, the permittee must take necessary and prudent measures, consistent with the mining method employed, to minimize material damage to the extent technologically and economically feasible to non-commercial buildings and occupied residential dwellings and structures related thereto except that measures required to minimize material damage to such structures are not required if:

(i) The permittee has the written consent of their owners or

(ii) Unless the anticipated damage would constitute a threat to health or safety, the costs of such measures exceed the anticipated costs of repair.

(3) Nothing in this part prohibits the standard method of room-and-pillar mining.

(b) The operator shall comply with all provisions of the approved subsidence control plan prepared pursuant to Section 784.20 of this Chapter.

(c) Repair of damage.

(1) Repair of damage to surface lands. The permittee must correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses that it was capable of supporting before subsidence damage.

(2) Repair or compensation for damage to non-commercial buildings and dwellings and related structures. The permittee must promptly repair, or

compensate the owner for, material damage resulting from subsidence caused to any non-commercial building or occupied residential dwelling or structure related thereto that existed at the time of mining. If repair option is selected, the permittee must fully rehabilitate, restore or replace the damaged structure. If compensation is selected, the permittee must compensate the owner of the damaged structure for the full amount of the decrease in value resulting from the subsidence-related damage. The permittee may provide compensation by the purchase, before mining, of a non-cancelable premium-prepaid insurance policy. The requirements of this paragraph apply only to subsidence-related damage caused by underground mining activities conducted after October 24, 1992.

(3) Repair or compensation for damage to other structures. The permittee must, to the extent required under applicable provisions of State law, either correct material damage resulting from subsidence caused to any structures or facilities not protected by paragraph (c)(2) of this section by repairing the damage or compensate the owner of the structures or facilities for the full amount of the decrease in value resulting from the subsidence. Repair of damage includes rehabilitation, restoration, or replacement of damaged structures or facilities. Compensation may be accomplished by the purchase before mining of a non-cancelable premium-prepaid insurance policy.

(4) Rebuttable presumption of causation by subsidence. -(i) Rebuttable presumption of causation for damage within angle of draw. If damage to any non-commercial building or occupied residential dwelling or structure related thereto occurs as a result of earth movement within an area determined by projecting a specified angle of draw from the outermost boundary of any underground mine workings to the surface of the land, a rebuttable presumption exists that the permittee caused the damage. The presumption will normally apply to a 30-degree angle of draw. A State regulatory authority may amend its program to apply the presumption to a different angle of draw if the regulatory authority shows in writing that the angle has a more reasonable basis than the 30-degree angle of draw, based on geotechnical analysis of the factors affecting potential surface impacts of underground coal mining operations in the State.

(ii) Approval of site-specific angle of draw. A permittee or permit applicant may request that the presumption apply to an angle of draw different from that established in the regulatory program. The regulatory authority may approve application of the presumption to a site-specific angle of draw different than that contained in the State or Federal program based on a site-specific analysis submitted by an applicant. To establish a site-specific angle of draw, an applicant must demonstrate and the regulatory authority must determine in writing that the proposed angle of draw has a more reasonable basis than the standard set forth in the State or Federal program, based on a site-specific geotechnical analysis of the potential surface impacts of the mining operation.

(iii) No presumption where access for pre-subsidence survey is denied. If the permittee was denied access to the land or property for the purpose of conducting the pre-subsidence survey in accordance with Sec. 784.20(a) of this chapter, no rebuttable presumption will exist.

(iv) Rebuttal of presumption. The presumption will be rebutted if, for example, the evidence establishes that: The damage predated the mining in question; the damage was proximately caused by some other factor or factors and was not proximately caused by subsidence; or the damage occurred outside the surface area within which subsidence was actually caused by the mining in question.

(v) Information to be considered in determination of causation. In any determination whether damage to protected structures was caused by

subsidence from underground mining, all relevant and reasonably available information will be considered by the regulatory authority.

(5) Adjustment of bond amount for subsidence damage. When subsidence-related material damage to land, structures or facilities protected under paragraphs (c)(1) through (c)(3) of this section occurs, or when contamination, diminution, or interruption to a water supply protected under Sec. 817.41 (j) occurs, the regulatory authority must require the permittee to obtain additional performance bond in the amount of the estimated cost of the repairs if the permittee will be repairing, or in the amount of the decrease in value if the permittee will be compensating the owner, or in the amount of the estimated cost to replace the protected water supply if the permittee will be replacing the water supply, until the repair, compensation, or replacement is completed. If repair, compensation, or replacement is completed within 90 days of the occurrence of damage, no additional bond is required. The regulatory authority may extend the 90-day time frame, but not to exceed one year, if the permittee demonstrates and the regulatory authority finds in writing that subsidence is not complete, that not all probable subsidence-related material damage has occurred to lands or protected structures, or that not all reasonably anticipated changes have occurred affecting the protected water supply, and that therefore it would be unreasonable to complete within 90 days the repair of the subsidence-related material damage to lands or protected structures, or the replacement of protected water supply.

(d) Underground mining activities shall not be conducted beneath or adjacent to--

- (1) Public buildings and facilities;
- (2) Churches, schools, and hospitals; or

(3) Impoundments with a storage capacity of 20 acre-feet or more or bodies of water with a volume of 20 acre-feet or more, unless the subsidence control plan demonstrates that subsidence will not cause material damage to, or reduce the reasonably foreseeable use of, such features or facilities. If the regulatory authority determines that it is necessary in order to minimize the potential for material damage to the features or facilities described above or to any aquifer or body of water that serves as a significant water source for any public water supply system, it may limit the percentage of coal extracted under or adjacent thereto.

(e) If subsidence causes material damage to any of the features or facilities covered by Paragraph (d) of this Section, the regulatory authority may suspend mining under or adjacent to such features or facilities until the subsidence control plan is modified to ensure prevention of further material damage to such features or facilities.

(f) The regulatory authority shall suspend underground mining activities under urbanized areas, cities, towns, and communities, and adjacent to industrial or commercial buildings, major impoundments, or perennial streams, if imminent danger is found to inhabitants of the urbanized areas, cities, towns, or communities.

(g) Within a schedule approved by the regulatory authority, the operator shall submit a detailed plan of the underground workings. The detailed plan shall include maps and descriptions, as appropriate, of significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measures taken to prevent or minimize subsidence and related damage, areas of full extraction, and other information required by the regulatory authority. Upon request of the operator, information submitted with the detailed plan may be held as confidential, in accordance with the requirements of Section 773.13(d) of this Chapter.

Sec. 817.122 Subsidence control: Public notice.

FEDERAL REGISTER CITE: 48 FR 24637 (24652)
PUBLISHED DATE: 06/01/83
EFFECTIVE DATE: 07/01/83

At least 6 months prior to mining, or within that period if approved by the regulatory authority, the underground mine operator shall mail a notification to all owners and occupants of surface property and structures above the underground workings. The notification shall include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

Sec. 817.131 Cessation of operations: Temporary.

FEDERAL REGISTER CITE: 44 FR 14902 (15441)
PUBLISHED DATE: 03/13/79
EFFECTIVE DATE: 04/12/79

(a) Each person who conducts underground mining activities shall effectively support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit. Temporary abandonment shall not relieve a person of his or her obligation to comply with any provisions of the approved permit.

(b) Before temporary cessation of mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, each person who conducts underground mining activities shall submit to the regulatory authority a notice of intention to cease or abandon operations. This notice shall include a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area prior to cessation or abandonment, the extent and kind of surface area reclamation which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures, and water-treatment activities that will continue during the temporary cessation.

Sec. 817.132 Cessation of operations: Permanent.

FEDERAL REGISTER CITE: 44 FR 14902 (15441)
PUBLISHED DATE: 03/13/79
EFFECTIVE DATE: 04/12/79

(a) The person who conducts underground mining activities shall close or backfill or otherwise permanently reclaim all affected areas, in accordance with this Chapter and according to the permit approved by the regulatory authority.

(b) All surface equipment, structures, or other facilities not required for continued underground mining activities and monitoring, unless approved as suitable for the postmining land use or environmental monitoring, shall be removed and the affected lands reclaimed.

Sec. 817.133 Postmining land use.

FEDERAL REGISTER CITE: 56 FR 65612 (65635)
PUBLISHED DATE: 12/17/91
EFFECTIVE DATE: 01/16/92

(a) General. All disturbed areas shall be restored in a timely manner to conditions that are capable of supporting--

- (1) The uses they were capable of supporting before any mining; or
- (2) Higher or better uses.

(b) Determining premining uses of land. The premining uses of land to which the postmining land use is compared shall be those uses which the land previously supported, if the land has not been previously mined and has been properly managed. The postmining land use for land that has been previously mined and not reclaimed shall be judged on the basis of the land use that existed prior to any mining; Provided that, If the land cannot be reclaimed to the land use that existed prior to any mining because of the previously mined condition, the postmining land use shall be judged on the basis of the highest and best use that can be achieved which is compatible with surrounding areas and does not require the disturbance of areas previously unaffected by mining.

(c) Criteria for alternative postmining land uses. Higher or better uses may be approved by the regulatory authority as alternative postmining land uses after consultation with the landowner or the land management agency having jurisdiction over the lands, if the proposed uses meet the following criteria:

- (1) There is a reasonable likelihood for achievement of the use.
- (2) The use does not present any actual or probable hazard to public health and safety, or threat of water diminution or pollution.
- (3) The use will not--
 - (i) Be impractical or unreasonable;
 - (ii) Be inconsistent with applicable land use policies or plans;
 - (iii) Involve unreasonable delay in implementation; or
 - (iv) Cause or contribute to violation of Federal, State, or local law.

(d) Approximate original contour: Criteria for variance. Surface coal mining operations that meet the requirements of this Paragraph may be conducted under a variance from the requirement to restore disturbed areas to their approximate original contour, if the following requirements are satisfied:

- (1) The regulatory authority grants the variance under a permit issued in accordance with Section 785.16 of this Chapter.
- (2) The alternative postmining land use requirements of Paragraph (c) of this Section are met.
- (3) All applicable requirements of the act and the regulatory program, other than the requirement to restore disturbed areas to their approximate original contour, are met.
- (4) After consultation with the appropriate land use planning agencies, if any, the potential use is shown to constitute an equal or better economic or public use.
- (5) The proposed use is designed and certified by a qualified registered professional engineer in conformance with professional standards established to assure the stability, drainage, and configuration necessary for the intended use of the site.
- (6) After approval, where required, of the appropriate State environmental agencies, the watershed of the permit and adjacent areas is shown to be improved.
- (7) The highwall is completely backfilled with spoil material, in a

manner which results in a static factor of safety of at least 1.3, using standard geotechnical analysis.

(8) Only the amount of spoil as is necessary to achieve the postmining land use, ensure the stability of spoil retained on the bench, and meet all other requirements of the Act and this Chapter is placed off the mine beach. All spoil not retained on the bench shall be placed in accordance with Sections 817.71-817.74.

(9) The surface landowner of the permit area has knowingly requested, in writing, that a variance be granted, so as to render the land after reclamation, suitable for an industrial, commercial, residential, or public use (including recreational facilities.)

(10) Federal, State, and local government agencies with an interest in the proposed land use have an adequate period in which to review and comment on the proposed use.

Sec. 817.150 Roads: General.

FEDERAL REGISTER CITE: 53 FR 45190 (45213)

PUBLISHED DATE: 11/08/88

EFFECTIVE DATE: 12/08/88

(a) Road classification system. (1) Each road, as defined in Sec. 701.5 of this chapter, shall be classified as either a primary road or an ancillary road.

(2) A primary road is any road which is --

(i) Used for transporting coal or spoil;

(ii) Frequently used for access or other purposes for a period in excess of six months; or

(iii) To be retained for an approval postmining land use.

(3) An ancillary road is any road not classified as a primary road

(b) Performance standards. Each road shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

(1) Control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust and dust occurring on other exposed surfaces, by measures such as vegetating, watering, using chemical or other dust suppressants, or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices;

(2) Control or prevent damage to fish, wildlife, or other habitat and related environmental values;

(3) Control or prevent additional contributions of suspended solids to streamflow or runoff outside the permit area;

(4) Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standard applicable to receiving waters;

(5) Refrain from seriously altering the normal flow of water in streambeds or drainage channels;

(6) Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress; and

(7) Use nonacid- and nontoxic-forming substances in road surfacing.

(c) Design and construction limits and establishment of design criteria. To ensure environmental protection appropriate for their planned duration and use, including consideration of the type and size of equipment used, the

design and construction or reconstruction of roads shall incorporate appropriate limits for grade, width, surface materials, surface drainage control, culvert placement, and culvert size, in accordance with current, prudent engineering practices, and any necessary design criteria established by the regulatory authority.

(d) Location. (1) No part of any road shall be located in the channel of an intermittent or perennial stream unless specifically approved by the regulatory authority in accordance with applicable Sections 817.41 through 817.43 and 817.57 of this chapter.

(2) Roads shall be located to minimize downstream sedimentation and flooding.

(e) Maintenance.

(1) A road shall be maintained to meet the performance standards of this part and any additional criteria specified by the regulatory authority;

(2) A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.

(f) Reclamation. A road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer needed for mining and reclamation operations. This reclamation shall include:

(1) Closing the road to traffic;

(2) Removing all bridges and culverts unless approved as part of the postmining land use;

(3) Removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements;

(4) Reshaping cut and fill slopes as necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain;

(5) Protecting the natural drainage patterns by installing dikes or cross drains as necessary to control surface runoff and erosion; and

(6) Scarifying or ripping the roadbed, replacing topsoil or substitute material and revegetating disturbed surfaces in accordance with Sections 817.22 and 817.111 through 817.116 of this chapter.

Sec. 817.151 Primary roads.

FEDERAL REGISTER CITE: 53 FR 45190 (45213)

PUBLISHED DATE: 11/08/88

EFFECTIVE DATE: 12/08/88

Primary roads shall meet the requirements of Sec. 817.150 and the additional requirements of this section.

(a) Certification. The construction or reconstruction of primary roads shall be certified in a report to the regulatory authority by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the construction or reconstruction of primary roads, a qualified registered professional land surveyor, with experience in the design and construction of roads. The report shall indicate that the primary road has been constructed or reconstructed as designed and in accordance with the approved plan.

(b) Safety Factor. Each primary road embankment shall have a minimum static factor of 1.3 or meet the requirements established under Sec. 784.24(c).

(c) Location. (1) To minimize erosion, a primary road shall be located, insofar as is practicable, on the most stable available surface.

(2) Fords of perennial or intermittent streams by primary roads are

prohibited unless they are specifically approved by the regulatory authority as temporary routes during periods of road construction.

(d) Drainage control. In accordance with the approved plan --

(1) Each primary road shall be constructed or reconstructed, and maintained to have adequate drainage control, using structures such as, but not limited to bridges, ditches, cross drains, and ditch relief drains. The drainage control system shall be designed to safely pass the peak runoff from a 10-year, 6-hour precipitation event, or greater event as specified by the regulatory authority;

(2) Drainage pipes and culverts shall be installed as designed, and maintained in a free and operating condition and to prevent or control erosion at inlets and outlets;

(3) Drainage ditches shall be constructed and maintained to prevent uncontrolled drainage over the road surface and embankment;

(4) Culverts shall be installed and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road;

(5) Natural stream channels shall not be altered or relocated without the prior approval of the regulatory authority in accordance with applicable Sections 816.41 through 816.43 and 816.57 of this chapter; and

(6) Except as provided in paragraph (c)(2) of this section, structures for perennial or intermittent stream channel crossings shall be made using bridges, culverts, low-water crossings, or other structures designed, constructed, and maintained using current, prudent engineering practices. The regulatory authority shall ensure that low-water crossings are designed, constructed, and maintained to prevent erosion of the structure or streambed and additional contributions of suspended solids to streamflow.

(e) Surfacing. Primary roads shall be surfaced with material approved by the regulatory authority as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

Sec. 817.180 Utility installations.

FEDERAL REGISTER CITE: 48 FR 20391 (20401)

PUBLISHED DATE: 05/05/83

EFFECTIVE DATE: 06/06/83

All underground mining activities shall be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the regulatory authority.

Sec. 817.181 Support facilities.

FEDERAL REGISTER CITE: 48 FR 20391 (20401)

PUBLISHED DATE: 05/05/83

EFFECTIVE DATE: 06/06/83

(a) Support facilities shall be operated in accordance with a permit issued for the mine or coal preparation plant to which it is incident or from which its operation results.

(b) In addition to the other provisions of this part, support facilities shall be located, maintained, and used in a manner that--

(1) Prevents or controls erosion and siltation, water pollution, and

damage to public or private property; and

(2) To the extent possible using the best technology currently available--

(i) Minimizes damage to fish, wildlife, and related environmental values; and

(ii) Minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any such contributions shall not be in excess of limitations of State or Federal law.

Sec. 817.200 Interpretative rules related to general performance.

FEDERAL REGISTER CITE: 48 FR 44777 (44781)

PUBLISHED DATE: 09/30/83

EFFECTIVE DATE: 10/31/83

The following interpretations of rules promulgated in Part 817 of this Chapter have been adopted by the Office.

(a) and (b) [Reserved]

(c) Interpretation of Section 817.22(e)--Topsoil removal.

(1) Results of physical and chemical analyses of overburden and topsoil to demonstrate that the resulting soil medium is equal to or more suitable for sustaining revegetation than the available topsoil, provided that trials and tests are certified by an approved laboratory in accordance with Section 817.22(e)(1)(ii), may be obtained from any one or a combination of the following sources:

(i) U.S. Department of Agriculture Soil Conservation Service published data based on established soil series;

(ii) U.S. Department of Agriculture Soil Conservation Service Technical Guides;

(iii) State agricultural agency, university, Tennessee Valley Authority, Bureau of Land Management or U.S. Department of Agriculture Forest Service published data based on soil series properties and behavior; or

(iv) Results of physical and chemical analyses, field site trials, or greenhouse tests of the topsoil and overburden materials (soil series) from the permit area.

(2) If the operator demonstrates through soil survey or other data that the topsoil and unconsolidated material are insufficient and substitute materials will be used, only the substitute materials must be analyzed in accordance with Section 817.22(e)(i).

(d) Interpretation of Section 817.133: Postmining land use.

(1) The requirements of Section 784.15(a)(2) of this Chapter, for approval of an alternative postmining land use, may be met by requesting approval through the permit revision procedures of Section 774.13 of this Chapter rather than requesting such approval through the permit application. The original permit application, however, must demonstrate that the land will be returned to its premining land use capability as required by Section 817.133(a).

An application for a permit revision of this type--(i) Must be submitted in accordance with the filing deadlines of Section 774.13 of this Chapter,

(ii) Shall constitute a significant alteration from the mining operations contemplated by the original permit, and

(iii) Shall be subject to the requirements of Sections 773 and 775 of this Chapter.