

TITLE 62: MINING
CHAPTER I: DEPARTMENT OF NATURAL RESOURCES

PART 1816
PERMANENT PROGRAM PERFORMANCE STANDARDS - SURFACE
MINING ACTIVITIES

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AUTHORITY: Implementing and authorized by the Surface Coal Mining Land Conservation and Reclamation Act [225 ILCS 720].

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Section 1816.11 Signs and Markers

- a) Specifications. Signs and markers required under this Part shall:
 - 1) Be posted and maintained by the person who conducts the surface mining activities;
 - 2) Be of a uniform design throughout the operation that can be easily seen and read;
 - 3) Be made of durable material; and

- 4) Conform to local ordinances and codes.
- b) Duration of maintenance. Signs and markers shall be maintained during the conduct of all activities to which they pertain.
- c) Mine and permit identification signs.
 - 1) Identification signs shall be displayed at each point of access to the permit area from public roads.
 - 2) Signs shall show the name, business address, and telephone number of the person who conducts the surface mining activities and the identification number of the current permit authorizing surface mining activities.
 - 3) Signs shall be retained and maintained until after the release of all bonds for the permit area.
- d) Perimeter markers. The perimeter of a permit area shall be clearly marked before the beginning of surface mining activities.
- e) Buffer zone markers. Buffer zones shall be marked along their boundaries as required under Section 1816.57.
- f) Topsoil markers. Where topsoil or other vegetation supporting material is segregated and stockpiled as required under Section 1816.22, the stockpiled material shall be clearly marked.
- g) Where required by State law, the operator shall replace section, township and other legal markers which serve to delineate political or geographic boundaries.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.13 Casing and Sealing of Drilled Holes: General Requirements

Each exploration hole, other drill or borehole, well, or other exposed underground opening shall be cased, sealed, or otherwise managed, as approved by the Illinois Department of Natural Resources, Office of Mines and Minerals (Department), to prevent acid or other toxic drainage from entering ground or 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 and adjacent area. If these openings are uncovered or exposed by surface mining activities within the permit area they shall be permanently closed, unless approved for water monitoring, or otherwise managed in a manner approved by the Department. Use of a drilled hole or borehole or

monitoring well as a water well must meet the provisions of Section 1816.41. This Section does not apply to holes solely drilled and used for blasting.

(Source: Amended at 20 Ill. Reg. 2027, effective January 19, 1996)

Section 1816.14 Casing and Sealing of Drilled Holes: Temporary

Each exploration hole, other drill or boreholes, wells, and other exposed underground openings which have been identified in the approved permit application for use to return coal processing waste or water to underground workings, or to be used to monitor ground water conditions, shall be temporarily sealed before use and protected during use by barricades, or fences, or other protective devices approved by the Department. These devices shall be periodically inspected and maintained in good operating condition by the person who conducts the surface mining activities.

Section 1816.15 Casing and Sealing of Drilled Holes: Permanent

When no longer needed for monitoring or other use approved by the Department upon a finding of no adverse environmental or health and safety effect, or unless approved for transfer as a water well under Section 1816.41, each exploration hole, other drilled hole or borehole, well, and other exposed underground opening shall be capped, sealed, backfilled, or otherwise properly managed, as required by the Department, under Section 1816.13 and consistent with 30 CFR 75.1711. Permanent closure measures shall be designed to prevent access to the mine workings by people, livestock, fish and wildlife, and machinery, and to keep acid or other toxic drainage from entering ground or surface waters.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.22 Topsoil and Subsoil

- a) Removal.
 - 1) All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. Where topsoil is of insufficient quantity or poor quality for sustaining vegetation, the materials approved by the Department in accordance with subsection (b) shall be removed as a separate layer from the area to be disturbed, and segregated.
 - 2) If topsoil is less than six (6) inches thick and no substitutes or supplements are approved in accordance with subsection (b), the operator shall remove a six (6) inch layer that includes the A horizon and the unconsolidated materials immediately below or the A horizon and all unconsolidated

materials if the total available is less than six (6) inches and treat the mixture as topsoil.

- 3) The Department shall not require the removal of topsoil for minor disturbances which:
 - A) Occur at the site of small structures, such as power poles, signs, fence lines or markers; or
 - B) Will not destroy the existing vegetation, will not cause erosion and will not degrade the quality or limit the future use of the soil.
- 4) All material 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 Department 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. The demonstration shall be based upon the information requirements of 62 Ill. Adm. Code 1780.18(b)(4).

c) Storage.

- 1) Materials removed under subsection (a) if not redistributed immediately shall be segregated and stockpiled.
- 2) Stockpiled materials shall:
 - A) Be selectively placed on a stable site within the permit area;
 - B) Be protected from contaminants and unnecessary compaction that would interfere with revegetation;
 - C) Be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures equally effective in controlling erosion approved by the Department; and

- D) Not be moved until required for redistribution unless approved by the Department.
- 3) Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials removed under subsection (a)(1) would be detrimental to the quality or quantity of those materials, the Department 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:
- A) Such action will not permanently diminish the capability of the topsoil of the host site; and
 - B) The material will be retained in a condition more suitable for redistribution than if stockpiled.
- d) Redistribution.
- 1) Topsoil materials removed under subsection (a) shall be redistributed in a manner that:
 - A) Achieves an approximate uniform, stable thickness consistent with the approved post-mining land use, contours and surface-water drainage systems;
 - B) Prevents excess compaction of the materials; and
 - C) Protects the materials from wind and water erosion and contamination before and after seeding and planting.
 - 2) Before redistribution of the material removed under subsection (a) the regraded land shall be treated if necessary to reduce potential slippage of the redistributed 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 Department shall not require the redistribution of topsoil or topsoil substitutes on the approved post-mining embankments of permanent impoundments or of roads if it determines that:

- A) 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
 - B) Such embankments will be otherwise stabilized.
- 4) Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the required vegetative cover.
- e) Subsoil segregation. The Department 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 subsections (c) and (d) if it finds that such subsoil layers are necessary to comply with the revegetation requirements of Sections 1816.111, 1816.113, 1816.114, 1816.116 and 1816.117.

(Source: Amended at 20 Ill. Reg. 2027, effective January 19, 1996)

Section 1816.41 Hydrologic Balance Protection

- a) General. All surface 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, such as diminution of recharge capacity, to prevent violations of State and Federal water quality standards and effluent limitations, to assure the protection or replacement of water rights, and to support approved post-mining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this Part. The Department shall require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented if the current approved plan is not sufficient to achieve this protection. 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, surface mining activities shall be conducted according to the plan approved under 62 Ill. Adm. Code 1780.21(h) 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.
- 2) Ground water quantity shall be protected by handling earth materials and runoff in a manner that will restore the approximate premining recharge capacity of the reclaimed area as a whole, excluding coal mine waste disposal areas and fills, so as to allow the movement of water to the ground water system.
- c) Ground water monitoring.
- 1) Ground water monitoring shall be conducted according to the ground water monitoring plan approved under 62 Ill. Adm. Code 1780.21(i). If unanticipated conditions develop, or if an approved operation or reclamation plan is modified or revised such that the current monitoring program would not detect possible adverse impacts to the hydrologic balance as a result of this change, then the Department shall require additional monitoring including, but not limited, to increased monitoring frequency, additional monitoring wells or changes in the number of parameters being monitored, when it is determined that the proposed, or approved, monitoring plan is not adequate to detect adverse impacts to the hydrologic balance.
 - 2) Ground water monitoring data shall be submitted every 3 months to the Department or more frequently as prescribed by the Department. Ground water monitoring reports shall be submitted by the first day of the second month following the reporting period, unless the Department specifies an alternative reporting schedule. 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 Department and immediately take the actions provided for in 62 Ill. Adm. Code 1773.17(e) and 1780.21(h).
 - 3) Ground water monitoring shall proceed through mining and continue during reclamation until bond release. Consistent with the procedures of 62 Ill. Adm. Code 1774.13, the Department may modify the monitoring requirements when such changes to the approved plan do not diminish the ability to detect adverse impacts to the hydrologic balance, including the parameters covered and the sampling frequencies, if the operator demonstrates, using the monitoring data obtained under this subsection that:

- A) 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 quality and quantity are suitable to support approved post-mining land uses; and the water rights of other users have been protected or replaced; or
 - B) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under 62 Ill. Adm. Code 1780.21.
- 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, except as provided for under subsection (g).
- d) Surface water protection. In order to protect the hydrologic balance, surface mining activities shall be conducted according to the plan approved under 62 Ill. Adm. Code 1780.21(h) 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 contributions of suspended solids to streamflow outside the permit area; and otherwise prevents 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 1816.42, 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 62 Ill. Adm. Code 1780.21(h).
- e) Surface water monitoring.
- 1) Surface water monitoring shall be conducted according to the surface water monitoring plan approved under 62 Ill. Adm. Code 1780.21(j). If unanticipated conditions develop, or if an approved operation or reclamation plan is modified or revised such that the current monitoring

program would not detect possible adverse impacts to the hydrologic balance as a result of this change, then the Department shall require additional monitoring including, but not limited to, changes in the number of parameters or frequency of sample collection, when it is determined that the approved plan is not designed to detect adverse impacts to the hydrologic balance.

- 2) Surface water monitoring data shall be submitted to the Department every 3 months, or more frequently as prescribed by the Department in those circumstances where a more frequent monitoring schedule is necessary to detect adverse impacts to the surface water system. This shall include, but not necessarily be limited to, copies of reports submitted for the National Pollutant Discharge Elimination System (NPDES) sent to the Illinois Environmental Protection Agency (EPA). Copies of NPDES reports shall be sent to the Department by the first day of the second month following the reporting period. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analytical results of any surface water sample indicates noncompliance with the permit conditions, the operator shall notify the Department within 5 days and immediately take the actions provided for in 62 Ill. Adm. Code 1773.17(e) and 1780.21(h). The reporting requirements of this paragraph do not exempt the operator from meeting any NPDES reporting requirements.
- 3) Surface water monitoring shall proceed through mining and continue until bond release. Consistent with 62 Ill. Adm. Code 1774.13, the Department may modify the monitoring requirements, except those required by the Illinois EPA, when such changes to the approved plan do not diminish the ability to detect adverse impacts to the hydrologic balance, including the parameters covered and sampling frequency if the operator demonstrates using the monitoring data that:
 - A) 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 post-mining land uses; and the water rights of other users have been protected or replaced; or
 - B) Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under 62 Ill. Adm. Code 1780.21(j).

- 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, except as provided for in Section 1816.49(b).
- f) Acid- and toxic-forming materials.
- 1) Drainage from acid- and toxic-forming materials into surface water and ground water shall be avoided by:
 - A) 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
 - B) 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 Section 1816.102.
- g) Before final release of bond, exploratory or monitoring wells shall be sealed in a safe and environmentally sound manner in accordance with Sections 1816.13 through 1816.15. With prior approval of the Department, wells may be transferred to another party for further use. At a minimum, the conditions of such transfer shall comply with State and local law and the permittee shall remain responsible for the proper management of the well until bond release in accordance with Sections 1816.13 through 1816.15.
- h) Any person who conducts surface mining activities shall replace the water supply of an owner of interest in real property who obtains all or part of his or her supply of water for domestic, agricultural, industrial, or other legitimate use from an underground or surface source, where the water supply has been adversely impacted by contamination, diminution, or interruption proximately resulting from the surface mining activities. Information used to determine the extent of the impact of mining upon ground water and surface water shall include, but not be

limited to, baseline hydrologic information required in 62 Ill. Adm. Code 1780.21 and 1780.22.

- i) Discharges into an underground mine.
 - 1) Discharges into an underground mine are prohibited, unless specifically approved by the Department after a demonstration that the discharge will:
 - A) Minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from surface mining activities;
 - B) Not result in a violation of water quality standards or effluent limitations set forth in Section 1816.42;
 - C) Be at a known rate and quality which shall meet the effluent limitations of Section 1816.42 for pH and total suspended solids, except that the Department may allow pH and total suspended solids to exceed effluent limits so long they will not result in any adverse impacts to the hydrologic balance, and
 - D) Meet with the approval of the Mine Safety and Health Administration.
 - 2) Discharges shall be limited to the following:
 - A) Water;
 - B) Coal processing waste;
 - C) Fly ash from a coal-fired facility;
 - D) Sludge from an acid-mine drainage treatment facility;
 - E) Flue-gas desulfurization sludge;
 - F) Inert materials used for stabilizing underground mines; and
 - G) Underground mine development wastes.

(Source: Amended at 26 Ill. Reg. 4232, effective March 6, 2002)

Section 1816.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations

Discharges of water from areas disturbed by surface mining activities shall be made in compliance with the Federal Water Pollution Control Act of 1972 as amended, (30 U.S.C. 1251 et seq.), the Environmental Protection Act (Ill. Rev. Stat. 1991, ch. 111 1/2, pars. 1001 et seq.) (415 ILCS 5/1) and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR 434 (1992). 40 CFR 434 (1992) does not include any later amendments or editions.

(Source: Amended at 17 Ill. Reg. 11031, effective July 1, 1993)

Section 1816.43 Diversions

- a) General Requirements.
 - 1) With the approval of the Department, 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 1816.46 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 Department under Section 1816.41(i).
 - 2) The diversion and its appurtenant structures shall be designed, located, constructed, maintained and used to:
 - A) Be stable;
 - B) Provide protection against flooding and resultant damage to life and property;
 - C) Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to stream flow outside the permit area. Appropriate sediment control measures for diversions may include, but not be limited to, maintenance of appropriate gradients, channel lining, revegetation, roughness structures, and detention basins; and

- D) Comply with the Rivers, Lakes, and Streams Act (Ill. Rev. Stat. 1991, ch. 19, pars. 52-79) (615 ILCS 5), Section 404 of the Federal Water Pollution Control Act of 1972, as amended (30 U.S.C. 1344), and all local ordinances.
- 3) Temporary diversions shall be removed promptly 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 permittee from maintaining water treatment facilities as otherwise required. When permanent diversions are constructed or stream channels restored prior to the removal of temporary diversions the permittee shall:
- A) Establish, restore, enhance where practicable, or maintain natural riparian vegetation on the banks of the stream, including any area that is subject to annual inundation;
 - B) Establish, or restore the stream to its natural meandering shape and to an environmentally acceptable gradient, as determined by the Department; and
 - C) Establish or restore the stream to a longitudinal profile and cross-section, including aquatic habitats (usually a pattern of riffles, pools, and drops rather than uniform depth) that approximate premining stream channel characteristics.
- 4) Diversion design shall incorporate the following:
- A) Channel lining shall be designed using standard engineering practices to pass safely the design velocities. Riprap shall consist of non-degradable, non-acid or toxic-forming rock such as sandstone, limestone, or other durable rock that will not slake in water and will be free of coal, clay or shale;
 - B) Freeboard shall be no less than 0.3 feet, except as provided for in subsection (a)(5). Protection shall be provided for transition of flows and for critical areas such as swales and curves. Where the area protected is a critical area, as determined by the Department, the design freeboard may be increased;

- C) Energy dissipaters shall be installed, when necessary, at discharge points where diversions intersect with natural streams and exit velocity of the diversion ditch flow is greater than that of the receiving stream;
 - D) Excess excavated material not necessary for diversion channel geometry or regrading of the channel shall be disposed of in accordance with Sections 1816.71 through 1816.74; and
 - E) Topsoil shall be handled in compliance with Section 1816.22.
- 5) If the terrain is such that out-of-bank flows can accommodate the design precipitation event without endangering health or the environment as a result of flooding, such as physical harm or slope failure, the need for diversion ditches may be modified by taking into account channels, banks, and flood plains.
- b) Diversions of perennial and intermittent streams.
- 1) Diversions of perennial and intermittent streams within the permit area are subject to Department approval pursuant to Section 1816.57(a).
 - 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 subsection (a)(2)(B) shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank, and floodplain configuration is adequate to pass safely the peak runoff of a ten (10) year, six (6) hour precipitation event for a temporary diversion and a one hundred (100) year, six (6) hour precipitation event for a permanent diversion.
 - 4) The longitudinal profile of the stream, the channel, and the floodplain shall be designed and constructed to remain stable. Erosion control structures such as channel lining structures, retention basins, and artificial channel roughness structures shall be used in diversions only when approved by the Department as being necessary to control erosion.

- 5) The design and construction of all stream channel diversions of perennial and intermittent streams shall be sealed by a qualified registered professional engineer as meeting the performance standards of this Part.
- 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 Department to lessen environmental impact. 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 subsection (a).
 - 3) The requirements of subsection (a)(2)(B) 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 two (2) year, six (6) hour precipitation event for a temporary diversion and a ten (10) year, six (6) hour precipitation event for a permanent diversion.

(Source: Amended at 17 Ill. Reg. 11031, effective July 1, 1993)

Section 1816.45 Hydrologic Balance: Sediment Control Measures

- 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 streamflow or to runoff outside the permit area;
 - 2) Meet the more stringent of applicable State or Federal effluent limitations; and
 - 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 area 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 1816.111(b);
- 2) Stabilizing the backfill material to promote a reduction in the rate and volume of runoff, in accordance with the requirements of Section 1816.101;
- 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; and
- 7) Treating with chemicals.

Section 1816.46 Hydrologic Balance: Siltation Structures

- a) Definitions. For the purpose of this Section only:
 - 1) Siltation structure means a sedimentation pond, a series of sedimentation ponds, or other treatment facility.
 - 2) Disturbed area shall not include those areas:
 - A) 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
 - B) For which the upstream area is not otherwise disturbed by the permittee.

- 3) Other treatment facilities means any chemical treatments, such as flocculation, or mechanical structures, such as clarifiers, that have a point-source discharge and that are utilized to prevent additional contributions of suspended solids to stream flow or runoff outside the permit area, or to comply with all applicable State and federal water quality laws and regulations.
- b) General Requirements
- 1) Additional contributions of suspended solids sediment to stream flow 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 subsection (b)(5) or (e).
 - 3) Siltation structures for an area shall be constructed before beginning any surface mining activities in that area and, upon construction, shall be sealed by a qualified registered professional engineer 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 1816.49.
 - 5) Siltation structures shall be maintained until removal is authorized by the Department and the disturbed area has been stabilized and revegetated. In no case shall the structure be removed sooner than two years after the last augmented seeding.
 - 6) When a 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 1816.111 through 1816.117. Sedimentation ponds approved by the Department for retention as permanent impoundments shall be exempted from this requirement.
 - 7) The Department encourages the retention of sedimentation ponds which will receive drainage from agricultural areas in the post-mining land use plan.
- c) Sedimentation ponds.

- 1) When used, sedimentation ponds shall:
 - A) Be used individually or in series;
 - B) Be located as near as possible to the disturbed area and out of perennial streams unless approved by the Department in accordance with Section 1816.57; and
 - C) Be designed, constructed, and maintained to:
 - i) Provide adequate sediment storage volume;
 - ii) Provide adequate detention time to allow the effluent from the ponds to meet effluent limitations specified in Section 1816.42;
 - iii) Contain or treat the ten year, 24 hour precipitation event ("design event") unless a lesser design event is approved by the Department based on terrain, climate, other site specific conditions, and on a demonstration by the permittee that the effluent limitations of Section 1816.42 will be met;
 - iv) Provide a nonclogging dewatering device adequate to maintain the detention time required under subsection (c)(1)(C)(ii);
 - v) Minimize, to the extent possible, short circuiting;
 - vi) Provide periodic sediment removal sufficient to maintain adequate volume for the design event;
 - vii) Ensure against excessive settlement;
 - viii) Be free of sod, large roots, frozen soil, and acid- or toxic-forming coal processing waste; and
 - ix) Be compacted properly.
- 2) Spillways. A sedimentation pond shall include either a combination of principal and emergency spillways or a single spillway configured as specified in Section 1816.49(a)(9) of this Part.

- d) Other treatment facilities.
 - 1) Other treatment facilities shall be designed to treat the ten year, 24 hour precipitation event unless a lesser design event is approved by the Department based on terrain, climate, other site specific conditions, and a demonstration by the permittee that the effluent limitations of Section 1816.42 will be met.
 - 2) Other treatment facilities shall be designed in accordance with the applicable requirements of subsection (c).
- e) Exemptions. Exemptions to the requirements to pass all drainage from disturbed areas through a siltation structure may be granted if the disturbed drainage area within the total disturbed area is small; and
 - 1) Alternate sediment control measures as described in Section 1816.45(b) are used in lieu of a siltation structure, and the permittee demonstrates that siltation structures are not necessary for drainage from the disturbed area to meet the effluent limitations and water quality standards for the receiving waters set forth in Section 1816.42; or
 - 2) The permittee demonstrates that siltation structures and alternate sediment control measures are not necessary for drainage from the disturbed area to meet the effluent limitations and water quality standards for the receiving waters set forth in Section 1816.42.

(Source: Amended at 24 Ill. Reg. 5967, effective March 21, 2000)

Section 1816.47 Hydrologic Balance: Discharge of Structures

Discharge from sedimentation ponds, permanent and temporary impoundments, coal processing waste dams and embankments, and diversions shall be controlled, by energy dissipaters, 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.

Section 1816.49 Impoundments

- a) The requirements of this subsection 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, October 1985), "Earth Dams and Reservoirs," shall comply with "Minimum Emergency Spillway Hydrologic Criteria" table in TR-60 and the requirements of this Section.
- 2) Impoundments meeting the size and other qualifying criteria of 30 CFR 77.216(a) shall comply with the requirements of 30 CFR 77.216 (1998) and this Section. 30 CFR 77.216 does not include any later editions or amendments. The plan required to be submitted to the District Manager of the Mine Safety and Health Administration (MSHA) under 30 CFR 77.216 shall also be submitted to the Department as part of the permit application insofar as the MSHA informational design standard requirements are duplicative of the requirements of 62 Ill. Adm. Code 1780. In addition, the permittee shall submit to the Department any certification issued by MSHA with respect to the design plan.
- 3) The design of impoundments shall be sealed in accordance with 62 Ill. Adm. Code 1780.25(a) as designed to meet the requirements of this Part using current, prudent engineering practices. The qualified registered professional engineer shall be experienced in the design and construction of impoundments.
- 4) Stability.
 - A) An impoundment meeting the Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR 77.216(a), 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.
 - B) Impoundments not included in subsection (a)(4)(A), except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions, or meet the design, construction and maintenance requirements of U.S. Natural Resources Conservation Service Practice Standard IL 378, "Ponds," June 1992. Practice Standard 378 is hereby incorporated by reference and does not include later editions or amendments.

- 5) 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 hydrology criteria in the "Minimum Emergency Spillway Hydrologic Criteria" table in TR-60.
- 6) Foundations.
 - A) 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 Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR 77.216(a), foundation investigation, as well as any necessary laboratory testing of foundation material, shall be performed to determine the design requirements for foundation stability.
 - B) 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) Impoundments shall include a combination of principal and emergency spillways which shall be designed and constructed to safely pass the design precipitation event specified in subsection (b) or (c).
- 10) Inspections. A qualified registered professional engineer or other qualified professional specialist, under the direction of the professional engineer, shall inspect the impoundment. The professional engineer or specialist shall be experienced in the construction of impoundments, as evidenced by the placement of a registered professional engineer's seal on the inspection report.
 - A) Impoundments meeting the SCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR 77.216(a), shall be inspected, examined and certified in accordance with 30 CFR

- 77.216. Annual status reports required under 30 CFR 77.216-4 shall be submitted to the Department within 30 days after the reporting period.
- B) All other impoundments shall be inspected at least quarterly during construction, provided at least one inspection is conducted for impoundments completed in less than one quarter, and upon completion of construction. The qualified registered professional engineer shall submit to the Department within 30 days after each inspection, a sealed report that the impoundment has been constructed as designed and in accordance with the approved plan and these regulations.
- C) A copy of the reports required in subsections (a)(10)(A) and (B), and the examination reports required in subsection (a)(11), shall be retained at or near the mine site. The Department may approve reports being retained at a different location if there is no permanent mine office.
- 11) Impoundments which do not meet the SCS Class B or C criteria for dams in TR-60, or subject to 30 CFR 77.216, shall be examined at least quarterly by a qualified person designated by the permittee for appearances of instability, structural weakness or other hazardous conditions. At least one of the quarterly examinations conducted during the calendar year shall be sealed by a qualified registered professional engineer and shall include a discussion of any appearances of instability, structural weakness or other hazardous conditions, and any other aspects of the structure affecting stability, and a statement indicating the pond has been maintained in accordance with the approved plan and these regulations. This examination shall be conducted during the period of October 1 through December 31 of each calendar year. The sealed examination report shall be submitted to the Department within 30 days after the examination. Impoundment examinations shall be conducted until the impoundment has been removed or until final bond release in accordance with 62 Ill. Adm. Code 1800.40. If the permittee can demonstrate that failure of the structure would not create a potential threat to public health and safety or threaten significant environmental harm, the following impoundments shall be exempt from all examination requirements of this subsection, following approval by the Department:
- A) Impoundments that are completely incised;

- B) Water impounding structures that impound water to a design elevation no more than five feet above the upstream toe of the structure and that can have a storage volume of not more than 20 acre-feet; provided the exemption request is accompanied by a report sealed by a registered professional engineer licensed in the State of Illinois, accurately describing the hazard potential of the structure. Hazard potential must be such that failure of the structure would not create a potential threat to public health and safety or threaten significant environmental harm. The report shall be field verified by the Department prior to approval and periodically thereafter. The Department may terminate the exemption if so warranted by changes in the area downstream of the structure or in the structure itself; and
 - C) Impoundments that do not facilitate mining or reclamation including, but not limited to, sewage lagoons, landscaping ponds, pools or wetlands in replaced stream channels, existing impoundments not yet used to facilitate mining, ephemeral waterbodies, active mining pits and differential settlement pools.
- 12) If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment shall promptly inform the Department of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Department shall be notified immediately. The Department 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 Department in the approved permit, based upon the following demonstration:
- 1) The size and configuration of the impoundment is 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 water quality standards set forth in Section 1816.42, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below water quality standards set forth in Section 1816.42.

- 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 post-mining land use.
- 7) The impoundment perimeter slopes shall be consistent with the intended use of the impoundment, not be steeper than the angle of repose and comply with subsection (a)(4). Where surface runoff enters the impoundment area, the side slope shall be protected against erosion.
 - A) Runoff from above the slope shall be diverted to erosion free outlets.
 - B) Grading of slopes shall be scheduled to be completed at the onset of the most favorable seeding period.
- 8) Embankment ponds, those having embankment heights of three feet or greater above natural ground elevation, shall have outslopes of 1v:2h or less and interior slopes to the normal pool elevation of 1v:2h or less.
- 9) Permanent impoundments
 - A) Permanent impoundments not meeting the Class B or C criteria for dams in TR-60, or the size or other qualifying criteria of 30 CFR 77.216(a), shall be provided with a spillway that will safely discharge a 25 year, six hour precipitation event, or such larger event as may be specified by the Department based on factors such as terrain, topography and soil type.
 - B) Permanent impoundments meeting the size or other criteria of 30 CFR 77.216(a) shall be provided with a spillway that will safely discharge a 100 year, six hour precipitation event, or such larger event as may be specified by the Department based on factors such as terrain, topography and soil type.

- C) Permanent impoundments meeting the Class B or C criteria for dams in TR-60 shall be provided with a spillway that meets the criteria in the "Minimum Emergency Spillway Hydrologic Criteria" table in TR-60, or such larger event as may be specified by the Department based on factors such as terrain, topography and soil type.
- 10) In lieu of the combination principal and emergency spillway requirements of Section 1816.49(a)(9), an impoundment may have a single spillway configured as set forth in subsections (b)(10)(A) and (b)(10)(B) that is designed and constructed to safely pass the applicable design precipitation specified in subsection (b)(9). The Department shall 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.
- c) Temporary impoundments.
- 1) Temporary impoundments not meeting the Class B or C criteria for dams in TR-60, or the size or other qualifying criteria of 30 CFR 77.216(a), shall be provided with a spillway that will safely discharge a 25 year, six hour precipitation event or such larger event as may be required by the Department based on factors such as terrain, topography and soil type. Temporary impoundments meeting the size or other criteria of 30 CFR 77.216(a) shall be provided with a spillway that will safely discharge a 100 year, six hour precipitation event, or such larger event as may be specified by the Department based on factors such as terrain, topography and soil type. Temporary impoundments meeting the Class B or C criteria for dams in TR-60 shall be provided with a spillway that meets the criteria in the "Minimum Emergency Spillway Hydrologic Criteria" table in TR-60 or such larger event as may be specified by the Department based on factors such as terrain, topography and soil type.
 - 2) In lieu of the combination principal and emergency spillway requirements of Section 1816.49(a)(9), an impoundment may have either:

- A) A single spillway configured as set forth in subsection (c)(2)(A)(i) or (c)(2)(A)(ii) that is designed and constructed to safely pass the applicable design precipitation specified in subsection (c)(1). The Department shall approve a single open-channel spillway that is:
- i) Of nonerodible construction and designed to carry sustained flows; or
 - ii) Earth or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected; or
- B) 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 design precipitation event when it is demonstrated by the permittee and certified by a qualified registered professional engineer in accordance with 62 Ill. Adm. Code 1780.25(a) 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. Impounding structures relying on this method to control runoff shall be located where failure would not be expected to cause loss of life or serious property damage, except where:
- i) In the case of an impoundment meeting the SCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR 77.216(a), it is designed to control the precipitation of the probably maximum precipitation of a 6-hour event, or greater event as specified by the Department.
 - ii) In the case of an impoundment not included in subsection (c)(2)(B)(i), it is designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Department.

(Source: Amended at 24 Ill. Reg. 5967, effective March 21, 2000)

Section 1816.56 Post-Mining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments, and Treatment Facilities

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 these regulations 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 these regulations and to conform to the approved reclamation plan.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.57 Hydrologic Balance: Stream Buffer Zones

- a) No land within one hundred (100) feet of the top of the bank of the normal channel of a perennial stream or an intermittent stream shall be disturbed by surface mining activities, except in accordance with Section 1816.43, unless the Department specifically authorizes surface mining activities close to or through such a stream upon finding:
 - 1) That the original stream channel and its associated riparian vegetation will be restored; and surface mining activities will not cause or contribute to a violation of Section 1816.42 and will not adversely affect the water quantity and quality or other environmental resources of the stream;
 - 2) If there will be a temporary or permanent stream channel diversion, it will comply with Section 1816.43.
- b) The area not to be disturbed shall be designated a buffer zone and marked as specified in Section 1816.11.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.59 Coal Recovery

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

Section 1816.61 Use of Explosives: General Requirements

- a) Each person who conducts surface mining activities shall comply with all applicable State and Federal laws in the use of explosives.

- b) All blasting operations shall be conducted by persons certified by the Department in accordance with 62 Ill. Adm. Code 1850.
- c) Blast design.
 - 1) An anticipated blast design shall be submitted if blasting operations will be conducted within:
 - A) One thousand (1,000) feet of any building used as a dwelling, public building, school, church, or community or institutional building outside the permit area; or
 - B) Five hundred (500) feet of an active or abandoned underground mine.
 - 2) The blast design may be presented as part of the permit application or at a time, before the blast, approved by the Department.
 - 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 air blast, flyrock, and ground vibration standards in Section 1816.67.
 - 4) The blast design shall be prepared and signed by a certified blaster.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.62 Use of Explosives: Pre-Blasting Survey

- a) At least thirty (30) days before initiation of blasting in a permit area, the operator shall notify, in writing, all residents or owners of structures located within one-half ($\frac{1}{2}$) mile of the permit area how to request a pre-blast or condition survey.
- b) Upon written request to the Department and the person who conducts the surface mining activities by a resident or owner of a dwelling or structure that is located within one-half ($\frac{1}{2}$) mile of any portion of the permitted area, or by the owner of a dwelling or structure at a distance greater than one-half ($\frac{1}{2}$) mile from the permit area but within one (1) mile of the blasting area and within an area determined by the Department to be appropriate in a particular situation on the basis of complaints or other information received by the Department, the person who

conducts the surface mining activities shall promptly conduct a pre-blasting survey or a condition survey of the dwelling or structure. For any structure where, in accordance with this Section, a survey has been requested by a previous resident or previous owner and the survey has been conducted by the permittee and copies of the survey report have been provided to the previous owner or resident and the Department, the permittee shall only be required to provide a copy of the previously completed survey report to any new or subsequent owner upon written request by the new or subsequent owner. If a structure is renovated, modified, or added to, subsequent to a pre-blast survey or a condition survey, then upon request to the Department a survey of such additions, modifications and renovations shall be performed in accordance with this Section.

- c) The survey shall determine the condition of the dwelling or structure and document any pre-blasting or existing damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cisterns, wells and other water systems warrant special attention such as the review of construction, drilling or completion specifications; however, the assessment of these structures may be limited to surface conditions.
- d) Any surveys requested more than ten (10) calendar days prior to the published scheduled beginning of blasting shall be completed by the operator before the start of blasting. If the request is made after the start of blasting the person who conducts the surface mining activity shall conduct a condition survey of the dwelling or structure. A condition survey shall contain information identical to a pre-blasting survey. The intent of this Section is to provide for either a pre-blasting or condition survey only.
- e) A written report of the survey shall be prepared and signed by the person who conducted the survey. The report may include recommendations of any special conditions or proposed adjustments to the blasting procedure which should be incorporated into the blasting plan to prevent damage. Copies of the report shall be provided to the person requesting the survey and to the Department within thirty (30) days of the date the survey was completed. If the person requesting the survey disagrees with the results of the survey, he or she may notify, in writing, both the permittee and the Department of the specific areas of disagreement. Instructions as to whom and to where the written comments on the results of the survey should be forwarded shall be included with the survey report.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.64 Use of Explosives: Public Notice of Blasting Schedule

- a) All blasting shall be conducted from sunrise to sunset, and at times announced in the blasting schedule. The Department shall limit the area covered, timing and sequence of blasting, as listed in the schedule, if such limitations are necessary and reasonable in order to protect public health, safety or welfare.
- b) Unscheduled blasting may be conducted only where public or operator health and safety so require. When an operator conducts an unscheduled blast, the operator, using audible warning signals, shall notify residents within one-half mile of the blasting site and document the reason(s) for the unscheduled blast in accordance with Section 1816.68(a)(17). Unscheduled blasting does not include nighttime blasting, which is prohibited at all times.
- c) Blasting schedule publication.
 - 1) Each person who conducts surface mining activities shall publish a blasting schedule at least ten days, but not more than 30 days, before beginning a blasting program in which blasts that use more than five (5) pounds of explosive or blasting agent are detonated. The blasting schedule shall be published in a newspaper of general circulation in the locality of the blasting site.
 - 2) Copies of the schedule shall be distributed by mail to local governments and public utilities and mailed or delivered to each residence within one-half mile of the proposed blasting area and to every other person within or outside such area to whom the Department requires to be mailed, and daily notices shall be provided to such persons prior to any blasting.
 - 3) The person who conducts the surface mining activities shall republish and redistribute the schedule by mail at least every 12 months and revise and republish the schedule at least ten days but not more than 30 days before blasting in areas not covered in the current schedule or if the actual blasting times differ from the time periods listed in the current schedule for more than 20% of the blasts fired.
- d) The blasting schedule shall contain at a minimum:
 - 1) Identification of the specific areas in which blasting will take place;
 - 2) Dates and time periods when explosives are to be detonated;
 - 3) Methods to be used to control access to the blasting area;

- 4) Types of audible warnings and all-clear signals to be used before and after blasting, and
 - 5) Name, address, and telephone number of operator.
- e) Public notice of changes in blasting schedules. Before blasting in areas or at times not in a previous schedule, the person who conducts the surface mining activities shall prepare a revised schedule according to the procedures in subsections (c) and (d).

(Source: Amended at 22 Ill. Reg. 20228, effective November 5, 1998)

Section 1816.66 Use of Explosives: Blasting Signs, Warnings, and Access Control

- a) Blasting signs shall meet the specifications of Section 1816.11. The operator shall:
- 1) Conspicuously display 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" and 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) Warning and all-clear signals of different character or pattern that are audible within one-half mile of the blast shall be given. Each person within the permit area and each person who resides or regularly works within one-half mile of the permit area shall be notified of the meaning of the signals in the blasting schedule. The requirement to supply daily notice may be fulfilled by the audible warning signals.
- c) Access to the blasting area shall be controlled to prevent the presence of livestock or unauthorized personnel during blasting and until an authorized representative of the person who conducts the surface mining activities has reasonably determined:
- 1) That no unusual circumstances, such as imminent slides or undetonated charges, exist; and

- 2) That access to and travel in or through the area can be safely resumed.
- d) Proximity to buildings and other facilities
 - 1) Blasting shall not be conducted within 300 feet of any building used as a dwelling unless waived by the owner or within 300 feet of a school, church, hospital, or nursing facility.
 - 2) Blasting shall not be conducted within 100 feet of facilities including, but not limited to, disposal wells, petroleum or gas storage facilities, municipal water storage facilities, fluid-transmission pipelines, or water and sewage lines unless a waiver is obtained from the owner of the facility and submitted to the Department prior to blasting within 100 feet.

(Source: Amended at 22 Ill. Reg. 20228, effective November 5, 1998)

Section 1816.67 Use of Explosives: Control of Adverse Effects

- a) 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 ground or surface water outside the permit area.
- b) Air blast limits
 - 1) Air blast shall be controlled so that it does not exceed the values specified below at any dwelling, public building, school, church, or commercial or institutional structure, unless such structure is owned by the person who conducts the surface mining activities and is not leased to any other person. If a building owned by the person conducting surface mining activities is leased to another person, the lessee may sign a waiver relieving the operator from meeting the air blast limitations of this subsection. The waiver shall be submitted to the Department before beginning blasting.

Lower frequency limit of measuring system, Hz +3dB	Maximum level in dB
0.1 Hz or lower--flat response*	134 peak
2.0 Hz or lower--flat response	133 peak
6.0 Hz or lower--flat response	129 peak

*Only when approved by the Department

- 2) The measuring systems used shall have a flat frequency response of at least 200 Hz at the upper end.
 - 3) The person who conducts blasting may satisfy the provisions of subsection (b) by meeting any of the three specifications in the chart in subsection (b)(1).
 - 4) If necessary to prevent damages specified in subsection (a), the Department shall specify lower maximum allowable air blast levels than those in subsection (b)(1) for use in the vicinity of a specific blasting operation.
- c) Air blast monitoring
- 1) When the cube root scaled distance, as defined in subsection (c)(2), to the nearest dwelling, public building, school, church, or commercial or institutional structure has a value less than 350 and when the burden to hole depth ratio is greater than 1.0, or the top stemming height is less than 70% of the burden dimension, the air blast produced by that blast shall be measured, recorded, analyzed, and reported pursuant to subsection (g) of this Section and Section 1816.68(b). This subsection shall not apply to horizontal blast holes drilled from the floor of the pit.
 - 2) Cube root scaled distance equals the distance, in feet, from the blast to a specified location divided by the cube root of the maximum weight of explosives, in pounds, to be detonated in any eight millisecond period.
 - 3) To ensure compliance with the limits contained in this Section, the Department may require an air blast measurement of any or all blasts, and may specify the location of such measurements.
- d) Flyrock, including blasted material traveling in the air, or along the ground, shall not be cast beyond the permit boundaries or beyond the area of regulated access required under Section 1816.66(c), or more than one-half the distance to the nearest dwelling or other occupied structure.
- e) Ground vibration limits
- 1) In all blasting operations, except as otherwise authorized in this Section, the maximum peak particle velocity shall not exceed one inch per second at the location of any dwelling, public building, school, church, or commercial or institutional building. At distances greater than 5,000 feet

from the blast to any structures described in this subsection, the maximum allowable peak particle velocity shall not exceed 0.75 inch per second at the locations of the structures described in this subsection. At distances less than 300 feet from the blast to any structures described in this subsection, the maximum allowable peak particle velocity shall not exceed 1.25 inch per second at the locations of the structures described in this subsection. These limits shall apply separately to each component of motion as defined in subsection (g). The Department shall reduce peak particle velocity limits if determined necessary to provide damage protection, if so recommended in any pre-blast survey or condition survey report provided pursuant to Section 1816.62.

- 2) Blasting shall be conducted to prevent adverse impacts on any underground mine and changes in the course, channel, or availability of ground or surface water outside the permit area. Ground vibration limits, including the maximum peak particle velocity limitation of subsection (e)(1), shall not apply at the following locations:
 - A) At structures owned by the person conducting the mining activity, and not leased to another party; and
 - B) At structures owned by the person conducting the mining activity, and leased to another party, if a written waiver by the lessee is submitted to the Department prior to blasting.
- f) Ground vibration monitoring.
 - 1) When the scaled distance, as defined below, has a value less than 65 at the nearest dwelling, public building, school, church, or commercial or institutional structure, a seismograph recording shall be made at or near the closest structure requiring protection.
 - 2) Scaled Distance = The distance, in feet, from the blast to a specified location divided by the square root of the maximum weight of explosives, in pounds, to be detonated in any eight (8) millisecond period.
 - 3) To ensure compliance with the limits contained in this Section, the Department may require a seismograph recording of any or all blasts and may specify the location at which such recordings are made.
- g) As used herein, seismograph recording or record or air blast recording or record shall mean:

A visually inspectable cartesian representation of the time history of the particle velocity levels or air blast levels versus time. Time is represented on the "X" axis. The particle velocity is shown by three traces representing mutually perpendicular components of motion. The components are oriented vertically, transversely, and longitudinally to the horizontal direction from the recording location to the location of the blast. The air blast time history is represented by a single trace. The record or recording includes either an analog representation of, or a written description of the vertical scale for the particle velocity traces and the air blast trace. The units for the particle velocity traces and scale are in inches per second. The units for the air blast trace and scale are millibars, pounds per square inch, or decibels. The recording also includes an analog of descriptive time scale. The time units are in seconds.

(Source: Amended at 22 Ill. Reg. 20228, effective November 5, 1998)

Section 1816.68 Use of Explosives: Records of Blasting Operations

- a) A record of each blast, including seismograph reports, shall be retained by the operator for at least three (3) years and shall be available for inspection by the Department and the public on request. The record is to be completed by the end of the work day following the day in which the blast occurred, including the seismograph meter reading, if available, and shall contain the following data:
- 1) Name of the operator conducting the blast;
 - 2) Location, date, and time of blast;
 - 3) Name, signature, and certification number of the blaster conducting the blast;
 - 4) The name of the owner or resident of, and the direction and distance, in feet, to the nearest dwelling, school, church, or commercial, or institutional building either:
 - A) Not located in the permit area; or
 - B) Not owned by the person who conducts the surface mining activities.
 - 5) Type of material blasted;
 - 6) Number of holes, burden, and spacing;

- 7) Diameter and depth of holes;
 - 8) Types of explosives used;
 - 9) Total weight of explosives used;
 - 10) Weight of explosives used per hole;
 - 11) Maximum weight of explosives detonated within any eight (8) millisecond period;
 - 12) Maximum number of holes or decks detonated within any eight (8) millisecond period;
 - 13) Initiation system;
 - 14) Type and length of stemming;
 - 15) Type of delay detonator and delay periods used;
 - 16) Sketch of the delay pattern, including decking;
 - 17) Reasons and conditions for each unscheduled blast;
 - 18) Wind velocity and direction; and
 - 19) Weather conditions, including those which may cause possible adverse blasting effects.
- b) Air blast and/or ground vibration recordings, or photographic copies thereof, where required, shall be kept at the mine site office for a period of three (3) years following the date of the blast, and shall be available for inspection by the Department and the public on request. The recordings shall include the following:
- 1) Maximum air blast and/or ground vibration levels recorded;
 - 2) The exact location of the monitoring equipment, and its distance from the blast, and the date and time of the recording;
 - 3) Name of the person and firm making the recording;

- 4) Name of the person and firm analyzing the recording. The recording shall be signed and dated by the person performing the analysis; and
- 5) The type of instrument, sensitivity, and calibration signal or certification of annual calibration. When the recordings required at Sections 1816.67(c) and 1816.67(g) are produced via digitized systems, the sampling rate of the digitizer, in samples per second, shall be stated.

(Source: Amended at 15 Ill. Reg. 17166, effective January 1, 1992)

Section 1816.71 Disposal of Excess Spoil: General Requirements

- a) Excess spoil shall be placed in designated disposal areas within a permit area, in a controlled manner to:
 - 1) Minimize the adverse effects of leachate and surface water runoff from the fill on surface and ground waters;
 - 2) Ensure mass stability and prevent mass movement during and after construction; and
 - 3) Ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use.
- b) Design certification.
 - 1) The fill and appurtenant structures shall be designed using current, prudent engineering practices. A qualified registered professional engineer experienced in the design of earth and rock fills shall seal 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) All vegetative and organic materials shall be removed from the disposal area prior to placement of the excess spoil. Topsoil shall be removed, segregated, and stored or replaced in accordance with Section 1816.22. If approved by the Department, 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.

- d) 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 from erosion, shall be vegetated upon completion of construction.
- e) The disposal areas shall be located on the most moderately sloping and naturally stable areas available as approved by the Department. Fill materials suitable for disposal shall be placed upon or above a natural terrace, bench or berm if such placement provides additional stability and prevents mass movement.
- f) Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding four (4) feet in thickness, concurrently compacted as necessary to ensure mass stability and 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 1816.22. The Department may approve a design which incorporates placement of excess spoil in horizontal lifts other than four (4) feet in thickness when it is demonstrated by the operator and sealed by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other requirements of this Section.
- g) The final configuration of the fill must be suitable for the approved post-mining land use. In addition:
 - 1) No permanent impoundments are allowed on the completed fill. Small depressions shall be allowed by the Department 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, as set forth in Sections 1816.41(a), 1816.97(a) and 1816.111;
 - 2) Box cut spoils shall blend with undisturbed land with a maximum outslope steepness of twenty-five (25) percent (4h:lv);
 - 3) Other direct cast spoil placed onto unmined land shall be graded so as to reduce the slope to the maximum extent by grading toward and over the mined area, and blending with the unmined land with an outslope that does not exceed fifteen (15) percent; and
 - 4) Drainage from the interior portion of the spoil shall not be directed over the outside slope of the box cut spoil unless an erosion control system is designated to accommodate the runoff from the interior area.

- h) 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 post-mining land use, as set forth in Sections 1816.41(a) and 1816.111(a). The grade of the outslope between terrace benches shall not be steeper than 2h:1v (fifty (50) percent). Terrace(s) are required where the vertical height of the excess spoil exceeds forty (40) feet.
- I) Where the slope in the disposal area exceeds 1v:2.8h (thirty-six (36) percent), or such lesser slope designated by the Department based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to stabilize the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed in accordance with 62 Ill. Adm. Code 1780.35(c) to determine the size of rock toe buttresses and keyway cuts.
- j) A qualified registered professional engineer or other qualified professional specialist under the direction of a registered professional engineer, experienced in the construction of earth and rockfill embankments, shall periodically inspect the fill during construction. Such inspections shall be made at least quarterly throughout construction and during the critical construction periods. Critical construction periods shall include at a minimum:
- 1)
 - A) Foundation preparation, including the removal of all organic material and topsoil;
 - B) Placement of underdrain and protective filter systems;
 - C) Installation of final surface drainage systems; and
 - D) The final graded and revegetated fill.
 - E) Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials.
 - 2) The qualified registered professional engineer shall provide to the Department a sealed report within two (2) weeks after each inspection that the fill has been constructed and maintained as designed and in accordance with the approved plan and 62 Ill. Adm. Code 1700 through 1850. The report shall include appearances of instability, structural weakness and other hazardous conditions.

- 3) The sealed report on the drainage system and protective filters shall include color photographs of the structure 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 sealed separately.
 - 4) 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 1816.74, color photographs shall be taken of the underdrain as the underdrain system is being formed.
 - 5) The photographs accompanying each sealed 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.
 - 6) A copy of each inspection report shall be retained at or near the mine site.
- k) Coal processing wastes shall not be disposed of in head-of-hollow or valley fills, and may only be disposed of in other excess spoil fills, if such waste is:
- 1) Placed in accordance with Section 1816.83;
 - 2) Demonstrated to be nontoxic- and nonacid-forming; and
 - 3) Demonstrated to be consistent with the design stability of the fill.
- l) Drainage control. If the disposal area contains springs, natural or manmade watercourses, 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.
- 1) Diversions shall comply with the requirements of Section 1816.43.
 - 2) Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall away from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid-, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone,

or other durable rock) that does not slake in water or degrade to soil material, and which is free of coal, clay or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

- m) The foundation and abutments of the fill shall be stable under all conditions of construction and operation. Sufficient foundation investigation, as well as any necessary laboratory testing of foundation materials, shall be performed in order to determine the design requirements for stability of the foundation. Analyses of foundation conditions shall include the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures.
- n) Excess spoil may be returned to underground mine workings, but only in accordance with a disposal program approved by the Department and MSHA under 62 Ill. Adm. Code 1784.25.
- o) 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 1816.41, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved post-mining land use as set forth in Section 1816.111(a).

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.72 Disposal of Excess Spoil: Valley Fills/Head-of-Hollow Fills

Valley fills and head-of-hollow-fills shall meet all of the requirements of Section 1816.71 and the additional requirements of this Section.

- a) The fill shall be designed to attain a long-term static safety factor of 1.5 based upon data obtained from subsurface exploration, geotechnical testing, foundation design, and accepted engineering analyses.
- b) 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 1816.43 and, in addition, to safely pass the runoff from a one hundred (100) year, six (6) hour precipitation event.
- c) 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 two hundred and fifty thousand (250,000) cubic yards of material and upstream drainage is diverted around the fill. The alternative rock-core chimney drain system shall be incorporated into the design and construction of the fill as follows:
- 1) The fill shall have, along the vertical projection of the main buried stream channel or rill, a vertical core of durable rock at least sixteen (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 1816.71(1).
 - 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 (three (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 ten thousand (10,000) cubic feet of water. Terraces on the fill shall be graded with a three (3) to five (5) percent grade toward the fill and a one (1) percent slope toward the rock core.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.74 Disposal of Excess Spoil: Durable Rock Fills

The Department 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 1816.71 are met.
- b) The excess spoil consists of at least eighty (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 twenty (20) percent of the fill volume, as determined by tests performed by a registered professional engineer and approved by the Department, is not durable rock.
- c) A qualified registered professional engineer seals that the design will ensure the stability of the fill and meet all other applicable requirements of this Part.
- 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 in Section 1816.71 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 1816.43 and to safely pass the runoff from a one hundred (100) year, six (6) hour precipitation event.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.75 Disposal of Excess Spoil: Preexisting Benches

- a) The Department may approve the disposal of excess spoil through placement on preexisting benches, provided that all the standards set forth in Section 1816.71(a), (b)(1), (d) through (i) and the requirements of this Section are met.

- b) Excess spoil shall be placed only on the solid portion of the preexisting bench.
- c) The fill shall be designed, using current, prudent engineering practices, to attain a long-term static safety factor of 1.3 for all portions of the fill.
- d) The preexisting bench shall be backfilled and graded to:
 - 1) Achieve the most moderate slope possible which does not exceed the angle of repose; and
 - 2) Eliminate the highwall to the maximum extent technically practical.
- e) Disposal of excess spoil from an upper actively mined bench to a lower preexisting bench by means of gravity transport may be approved by the Department 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 Department 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 as determined by factors such as excessive sloughing and cracking;
 - 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 1816.22. 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.

(Source: Added 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.79 Protection of Underground Mining

No surface mining activities shall be conducted closer than five hundred (500) feet to any point of either an active or abandoned underground mine, except to the extent that:

- a) The activities result in improved resource recovery, abatement of water pollution, or elimination of hazards to the health and safety of the public; and
- b) The nature, timing and sequence of the activities that propose to mine closer than five hundred (500) feet to an active underground mine are jointly approved by the Department and the Mine Safety and Health Administration (MSHA).

(Source: Amended at 20 Ill. Reg. 2027, effective January 19, 1996)

Section 1816.81 Coal Mine Waste: General Requirements

- a) All coal mine waste shall be placed in new or existing disposal areas approved by the Department for this purpose. These areas shall be within a permit area. Coal mine waste shall be placed in a controlled manner to:
 - 1) Minimize adverse effects of leachate and surface water runoff on surface and ground water quality and quantity in accordance with Section 1816.41;
 - 2) Ensure mass stability and prevent mass movement during and after construction by:
 - A) Spreading the coal mine waste in layers no more than twenty-four (24) inches in thickness;
 - B) Compacting the coal mine waste to prevent spontaneous combustion and to provide the strength required for stability of the coal processing waste bank.
 - C) Variations shall be allowed in these requirements for the disposal of dewatered fine coal mine waste (minus twenty-eight (28) sieve size) with approval of the Department, if, because of site-specific

conditions, compliance with the requirements of subsections (c)(1) and (c)(2) is not necessary to meet the performance standards of this Part;

- 3) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use;
 - 4) Not create a public safety hazard; and
 - 5) Prevent combustion.
- b) Coal mine waste materials from activities located outside a permit area, such as those activities at other mines or abandoned mine waste piles may be disposed of in the permit area only if approved by the Department. Approval shall be based on a showing by the person who conducts surface mining activities in the permit area 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 Department. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall seal 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, such as on-site investigations and test borings, 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 Department shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If procedures cannot be formulated or implemented to ensure compliance with subsection (a), the Department shall be notified immediately. The Department

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 Department and MSHA under 62 Ill. Adm. Code 1784.25.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.83 Coal Mine Waste: Refuse Piles

Refuse piles shall meet the requirements of Section 1816.81, the additional requirements of this Section, and the requirements of 30 CFR 77.214 and 77.215 (1989). 30 CFR 77.214 and 77.215 (1989) do not include any subsequent amendments or editions.

- a) Drainage control
 - 1) If the disposal area contains springs, natural or man-made 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 piles. Runoff from the 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 1816.43 to safely pass the runoff from a 100 year, six 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 1816.71(1)(2).
- b) Surface area stabilization. Slope protection shall be provided to minimize erosion at the site. All disturbed areas, including diversion channels that are not riprapped or otherwise protected from erosion, 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 1816.22.

If approved by the Department, 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 post-mining land use. Terraces may be constructed on the outslope of the refuse pile if required for stability, erosion control, conservation of soil moisture, or facilitation of the approved post-mining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50%).
 - 3) No permanent impoundments shall be allowed on the completed refuse pile. Small depressions may be allowed by the Department if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation, and if they are not incompatible with stability of the refuse pile.
 - 4) Following final grading of the refuse pile, the coal mine waste shall be covered with a minimum of four feet of the best available, nontoxic and noncombustible material, in a manner that does not impede drainage from the underdrains. The Department may allow less than four feet of cover material based on physical and chemical analyses which show that the requirements of Section 1816.111 through 1816.117 will be met. The Department shall require the addition of neutralization material to be added to the coal mine waste if, based on physical and chemical analyses, this material is needed to prevent acid mine drainage. This subsection (c)(4) is also applicable to the reclamation of fine coal waste (slurry) not meeting the definition of refuse piles.
- 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 inspections shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include foundation preparation including the removal of all organic material and topsoil; placement of underdrains and protective filter systems; installation of final surface drainage systems; and 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.

- 2) The qualified registered professional engineer shall provide a sealed report to the Department promptly after each inspection that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and 62 Ill. Adm. Code 1700 through 1850. The report shall include appearances of instability, structural weakness, and other hazardous conditions.
- 3) The sealed 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 sealed 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.

(Source: Amended at 22 Ill. Reg. 20228, effective November 5, 1998)

Section 1816.84 Coal Mine Waste: Impounding Structures

New and existing impounding structures constructed of coal mine waste or intended to impound coal mine waste shall meet the requirements of Section 1816.81.

- a) Coal mine waste shall not be used for construction of impounding structures unless it has been demonstrated to the Department that the stability of such a structure conforms to the requirements of this Part and 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 Department in accordance with 62 Ill. Adm. Code 1780.25.
- b) Construction Requirements
 - 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 1816.49(a) and (c). Such structures may not be retained permanently as part of the approved post-mining land use.

- 2) Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of 30 CFR 77.216(a) 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 Department after consideration of factors such as watershed size and characteristics necessary to ensure design in accordance with prudent engineering practices.
- c) Spillways and outlet works shall be designed to provide adequate protection against erosion and corrosion in accordance with Section 1816.47. 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 causes instability or erosion of the impounding structure shall be diverted into stabilized diversion channels designed to meet the requirements of Section 1816.43 and designed to safely pass the runoff from a one hundred (100) year, six (6) hour design precipitation event.
- e) Impounding structures constructed of or impounding coal mine waste shall be designed so that at least ninety (90) percent of the water stored during the design precipitation event can be removed within a ten (10) day period.
- f) For an impounding structure constructed of or impounding coal mine waste, at least ninety (90) percent of the water stored during the design precipitation event shall be removed within the 10-day period following the design precipitation event.

(Source: Added at 17 Ill. Reg. 11031, effective July 1, 1993)

Section 1816.87 Coal Mine Waste: Burned Waste Utilization

- a) Coal mine waste fires shall be extinguished by the person who conducts the surface mining activities, in accordance with the plan approved by the Department and the MSHA. 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 extinguishing operations.

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

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.89 Disposal of Noncoal Mine Wastes

- a) Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible material generated during surface 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, 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 to a permitted 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 two feet of soil cover shall be placed over the site, slopes stabilized, and revegetation accomplished in accordance with Sections 1816.111 through 1816.117. Operation of the disposal site shall be conducted in accordance with all local, State, and Federal requirements. Areas reclaimed to cropland capability shall have a minimum of four feet of suitable soil cover.
- 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 eight feet of any coal outcrop or coal storage area.
- d) Notwithstanding any other provision in 62 Ill. Adm. Code 1700 through 1850 any noncoal mine waste defined as "hazardous" under Section 3001 of the Resource Conservation and Recovery Act (RCRA) (P. L. 94-580, as amended) and 40 CFR 261 shall be handled in accordance with the requirements of Subtitle C of RCRA and in accordance with the Illinois Environmental Protection Act as implemented by Title 35, Subtitle G, Part 721.

(Source: Amended at 24 Ill. Reg. 5967, effective March 21, 2000)

Section 1816.95 Stabilization of Surface Areas

- a) All exposed surface areas shall be protected and stabilized to control erosion and air pollution attendant to erosion in accordance with Section 1816.45(a).
- b) Rills and gullies, deeper than nine (9) inches, which form in areas that have been regraded and topsoiled and rills and gullies of lesser size which the Department determines either disrupt the approved post-mining land use or the reestablishment of the vegetative cover, or cause or contribute to a violation of Section 1816.42 for receiving streams shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

(Source: Added 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.97 Protection of Fish, Wildlife, and Related Environmental Values

- a) The operator shall, to the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the activities on fish, wildlife, and related environmental values, and shall achieve enhancement of such resources where practicable.
- b) No surface mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary of the United States Department of the Interior (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 immediately report to the Department any State- or federally-listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the Department 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) No surface 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 Department any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the Department 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 in order to ensure that the operation is not in violation of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq.).

- d) Nothing in these regulations 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, surface mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Department determines that such requirements are unnecessary, due to factors such as the absence of raptors;
 - 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 specified in 62 Ill. Adm. Code 1773.12;
 - 3) Design fences, overland conveyers, and other potential barriers to permit passage for large mammals, except where the Department determines that such requirements are unnecessary, due to factors such as the absence of large mammals; and
 - 4) Fence, cover, or use of other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.
- f) The operator conducting surface 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. Surface mining activities shall avoid disturbances to, enhance where practicable, or restore, habitats of unusually high value for fish and wildlife such as wetlands and riparian vegetation.
- g) Where fish and wildlife habitat is to be a post-mining 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 post-mining land use, 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 post-mining land use, and where consistent with the approved post-mining land use, the operator shall intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

(Source: Amended at 20 Ill. Reg. 2027, effective January 19, 1996)

Section 1816.99 Slides and Other Damage

- a) An undisturbed natural barrier or constructed outcrop shall be provided beginning at the elevation of the lowest coal seam to be mined and extending from the outslope for such distance as may be determined by the Department as is needed to assure stability. The barrier shall be retained in place to prevent slides and erosion.
- b) 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 surface mining activities shall notify the Department by the fastest available means and comply with any remedial measures required by the Department.
- c) Operators that remove and do not replace the lateral support within a three (3) month period shall not, unless mutually agreed upon by the operator and the adjacent property owner, approach property lines, established right-of-way lines of any public roads, streets or highways closer than a distance, measured horizontally from the property line or right-of-way, equal to ten (10) feet plus one and one-half (1 1/2) times the depth of any excavation except where consolidated materials or materials of sufficient hardness or ability to resist weathering and to inhibit erosion or sloughing exists in the excavation, the distance from the property line or any established right-of-way line shall not, unless mutually agreed, be closer than a distance equal to ten (10) feet plus one and one-half (1 1/2) times the depth from the natural ground surface to the top of the consolidated material or materials. When the operator desires to remove the lateral support and replace it

within a three (3) month period, the operator shall submit to the Department a written request for said purpose, outlining how the lateral support shall be replaced within three (3) months. Said request shall be approved or denied by the Department in accordance with 62 Ill. Adm. Code 1774.

(Source: Amended at 14 Ill. Reg. 11830, effective January 1, 1991)

Section 1816.100 Contemporaneous Reclamation

Reclamation efforts, including, but not limited to, backfilling, grading, topsoil replacement, and revegetation, on all land that is disturbed by surface mining activities shall occur as contemporaneously as practicable with mining operations, considering possible environmental ramifications except when such mining operations are conducted in accordance with a variance for concurrent surface and underground mining activities issued under 62 Ill. Adm. Code 1785.18. The Department shall not deny a reasonable extension under Sections 1816.101 through 1816.106 if a permittee can demonstrate that an act of God, strikes, inability to receive ordered equipment or extended periods of unseasonable and not to be expected weather have made completion within time limits impossible. Such extensions shall be made until a specific date determined by the Department.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.101 Backfilling and Grading: General Requirements

Timing of backfilling and grading.

- a) Contour mining. Rough backfilling and grading shall follow coal removal by not more than sixty (60) days or one thousand, five hundred (1,500) linear feet. The Department may grant additional time for rough backfilling and grading if the permittee can demonstrate, through a detailed written analysis under 62 Ill. Adm. Code 1780.18(b)(3), that additional time is necessary.

- b)
 - 1) Area surface mining. Rough backfilling and grading shall be completed within one hundred eighty (180) days following coal removal and shall not be more than four (4) spoil ridges behind the pit being worked, the spoil from the active pit being considered the first ridge. The Department may grant additional time for rough backfilling and grading if the permittee can demonstrate, through a detailed written analysis under 62 Ill. Adm. Code 1780.18(b)(3), that additional time is necessary.

- 2) Final grading (root medium placement, topsoil/substitute material placement, erosion control system installation) shall be completed in accordance with the approved reclamation plan prior to the expiration of fifteen (15) months after June 30th of the fiscal year in which coal removal occurred.
- c) Other Disturbed Areas: All backfilling, rough grading, and final grading of all other disturbed areas shall be completed in accordance with the approved reclamation plan not later than twelve (12) months after cessation of active use as determined by the Department.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.102 Backfilling and Grading: General Grading Requirements

- a) Disturbed areas shall be backfilled and graded to:
 - 1) Achieve the approximate original contour, except as provided in subsection (k);
 - 2) Eliminate all highwalls, spoil piles, and depressions, except as provided in subsection (h) (small depressions) and in subsection (k)(3)(C) (previously mined highwalls);
 - 3) Achieve a post-mining 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 in accordance with Sections 1816.42 and 1816.95; and
 - 5) Support the approved post-mining land use.
- b) Spoil, except excess spoil disposed of in accordance with Sections 1816.71 through 1816.74, shall be returned to the mined-out area.
- c) Spoil and waste materials shall be compacted to ensure stability or to prevent leaching of toxic materials.
- d) Spoil may be placed on the area outside the mined-out 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 material shall be removed from the area.
 - 2) The topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with Section 1816.22.
 - 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 area shall be in accordance with Sections 1816.81 and 1816.83, 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 material, or treated, to control the impact on surface and groundwater in accordance with Section 1816.41, to prevent sustained combustion, and to be in compliance with the revegetation requirements of Section 1816.111(a) and the approved post-mining land use.
 - g) Cut-and-fill terraces may be allowed by the Department where:
 - 1) Needed to conserve soil moisture to ensure revegetation, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved post-mining land use in accordance with Sections 1816.41, 1816.95 and 1816.111; or
 - 2) Specialized grading, foundation conditions, or roads are required for the approved post-mining land use, in which case the final grading may include a terrace to ensure the safety, stability, and erosion control necessary to implement the post-mining land use plan.
 - h) Small depressions may be constructed if they are needed to minimize erosion, create and enhance wildlife habitat, or assist revegetation by retaining moisture, in accordance with Sections 1816.41, 1816.95, 1816.97 and 1816.111.
 - I) Permanent impoundments may be approved if they meet the requirements of Sections 1816.49 and 1816.56.
 - j) Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion in accordance with Section 1816.45 and provides a surface for replacement of topsoil that will minimize slippage such as discing and scarification.

- k) The post-mining slope may vary from the approximate original contour when:
 - 1) The standards for thin overburden in Section 1816.104 are met;
 - 2) The standards for thick overburden in Section 1816.105 are met; or
 - 3) Approval is obtained from the Department for:
 - A) Mountaintop removal operations in accordance with 62 Ill. Adm. Code 1785.14;
 - B) A variance from approximate original contour requirements in accordance with 62 Ill. Adm. Code 1785.16; or
 - C) Incomplete elimination of highwalls in previously mined areas in accordance with Section 1816.106.

(Source: Amended at 14 Ill. Reg. 11830, effective January 1, 1991)

Section 1816.104 Backfilling and Grading: Thin Overburden

In surface coal mining which is carried out at the same location over a substantial period of time where the operation transects the coal deposit and where the thickness of the coal deposit relative to the thickness of the overburden is large and where the operator demonstrates that the spoil and other waste materials available from the entire permit area are insufficient, giving due consideration to volumetric expansion, to restore the disturbed area to its approximate original contour, the operator shall, at a minimum:

- a) Use all available spoil and waste materials to attain the lowest practicable grade, but not more than the angle of repose; and
- b) Meet the requirements of Sections 1816.102(a)(2) through 1816.102(j).

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.105 Backfilling and Grading: Thick Overburden

In surface coal mining where the thickness of the overburden is large relative to the thickness of the coal deposit and where the operator demonstrates that the volume of the spoil and other waste materials is more than sufficient to restore the disturbed area to approximate original contour, the operator shall, at a minimum, after restoring to approximate original contour:

- a) Use the spoil and waste materials to attain the lowest practicable grade, but not more than the angle of repose;
- b) Meet the requirements of Sections 1816.102(a)(2) through 1816.102(j); and
- c) Dispose of any excess spoil in accordance with Sections 1816.71 through 1816.74.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.106 Backfilling and Grading: Previously Mined Areas

Remining operations on previously mined areas that contain a preexisting highwall shall comply with the requirements of Sections 1816.102 through 1816.107 except as provided in this Section. The requirements of Section 1816.102(a)(1) and (2) requiring the elimination of highwalls shall not apply to remining operations where the volume of all reasonably available spoil is demonstrated in writing to the Department 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:

- a) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil from the previous mining operation in the immediate vicinity of the remining operation shall be included within the permit area.
- b) The backfill shall be graded to a slope which is compatible with the approved post-mining land use and which provides drainage and long-term stability in accordance with Sections 1816.41(a) and 1816.102(a)(3).
- c) Any highwall remnant shall be stable, as determined by factors such as excessive sloughage and cracking, and not pose a hazard to the public health and safety or to the environment. The operator shall demonstrate that the highwall remnant is stable.
- d) 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.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.107 Backfilling and Grading: Steep slopes

- a) Surface mining activities on steep slopes shall be conducted so as to meet the requirements of Sections 1816.102 through 1816.106, and the requirements of this Section except where mining is conducted on flat or gently rolling terrain with an occasional steep slope through which the mining proceeds and leaves a plain or predominantly flat area or where operations are conducted in accordance with 62 Ill. Adm. Code 1824.
- 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 Department finds that this disturbance will facilitate compliance with the environmental protection standards of 62 Ill. Adm. Code 1810 through 1828 and the disturbance is limited to that necessary to facilitate compliance.
- d) Woody materials shall not be buried in the backfilled area unless the Department determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

(Source: Added at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.111 Revegetation: General Requirements

- a) The permittee shall establish on regraded areas and on all other disturbed areas except areas where vegetative cover is inconsistent with the approved post-mining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan 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 post-mining land use and approved by the Department;
 - 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 post-mining 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 the Illinois Noxious Weed Law [505 ILCS 100], the Illinois Seed Law [505 ILCS 110] and the Illinois Pesticide Act [415 ILCS 60].
- c) In order to prevent soil erosion, the Department shall grant an exemption to the requirements of subsections (b)(2) and (b)(3) when the reestablished species will 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 Department approved a cropland post-mining land use, the permittee shall be exempt from the requirements of subsections (a)(1), (a)(3), (b)(2), and (b)(3). The requirements of 62 Ill. Adm. Code 1823.15 apply to areas identified as prime farmland.

(Source: Amended at 24 Ill. Reg. 5967, effective March 21, 2000)

Section 1816.113 Revegetation: Timing

- a) 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.
- b) When the approved reclamation plan includes the planting of trees and/or shrubs, the trees and/or shrubs shall be planted within 2 years after replacement of the plant-growth medium.

(Source: Amended at 26 Ill. Reg. 4232, effective March 6, 2002)

Section 1816.114 Revegetation: Mulching and Other Soil Stabilizing Practices

- a) Mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Department shall 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.
- b) Mulches shall be mechanically or chemically anchored to the soil surface to assure effective protection of the soil and vegetation. The Department shall waive the mulch anchoring requirement where seasonal, soil, and/or slope factors result in a condition where anchoring is not necessary to stabilize the mulch.

(Source: Amended at 10 Ill. Reg. 8985, effective July 1, 1986)

Section 1816.116 Revegetation: Standards for Success

- a) Success of Revegetation
 - 1) Success of revegetation shall be judged in accordance with this Section and Section 1816.117.
 - 2) Requirements
 - A) 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 Department in accordance with subsection (a)(2)(C).
 - B) The period of extended responsibility shall continue for a period of not less than 5 full years, except that on lands eligible for re-mining, the period of responsibility (until September 30, 2004) shall be 2 full years. Vegetation parameters identified in subsection (a)(1) shall equal or exceed the approved success standard set forth in subsection (a)(3).
 - C) The Department shall approve selective husbandry practices, excluding irrigation or augmented seeding or augmented fertilization, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the post-mining land use or if

discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal conservation and land use management practices within the region for unmined lands having land uses similar to the approved post-mining land use of the disturbed area, including such practices as disease, pest, and vermin control; any pruning, reseeding and/or transplanting specifically necessitated by such actions; approved agricultural practices described in the Illinois Agronomy Handbook, 23rd Edition (University of Illinois at Champaign-Urbana, College of Agriculture, Consumer and Environmental Science, 1917 Wright St., Champaign IL 61820 (2001-2002; this incorporation includes no later amendments or editions)); and those practices that are a part of an approved conservation plan subject to the Farm Security and Rural Investment Act of 2002 (P.L. 107-171; 116 Stat. 134). On all lands with a postmining land use other than cropland, any areas reseeded or replanted as a part or result of a normal husbandry practice must be sufficiently small in size and limited in extent of occurrence, or part of a hay management plan which is an agricultural practice described by the Illinois Agronomy Handbook or as part of an approved conservation plan subject to the Farm Security and Rural Investment Act of 2002, and the reestablished vegetation must be in place for a sufficient length of time so as not to adversely affect the Department's ability to make a valid determination at the time of bond release as to whether the site has been properly reclaimed to a condition in which it will support a diverse, effective, permanent vegetative cover of the required nature and productivity. Copies of the Illinois Agronomy Handbook and the Farm Security and Rural Investment Act of 2002 are available at the Department's Springfield office.

- D) Rill and gully repair on cropland-capable reclaimed land will not be considered augmentation if a permittee has an approved erosion control plan in place in the field pursuant to 62 Ill. Adm. Code 1823.14(g) or 1825.14(f), and shortly after the first rainfall event after the repair, the Department makes the following determinations:
- i) the area is a minor erosional feature;
 - ii) the area is small;

- iii) the erosion is not expected to recur; and
- iv) the area is stable.

The Department shall notify the permittee in writing whether or not a repair is augmentative. Such written notice shall be in the form of an inspection report or other document issued by the Department.

- E) Rill and gully repair on noncropland-capable land will not be considered augmentation if, shortly after the first rainfall event after the repair, the Department makes the following determinations:

- i) the area is a minor erosional feature;
- ii) the area is small;
- iii) the erosion is not expected to recur; and
- iv) the area is stable.

The Department shall notify the permittee in writing whether or not a repair is augmentative. Such written notice shall be in the form of an inspection report or other document issued by the Department.

- F) Augmentation

Wetlands shall be considered augmented when significant alterations are made to the size or character of the watershed, pumping is used to maintain water levels, or neutralizing agents, chemical treatments or fertilizers are applied to the wetland area, except that wetlands managed as wildlife food plot areas using agricultural techniques shall not be considered augmented when normal agricultural husbandry practices, such as routine liming and fertilization, are used. Water level management using permanent water control structures is considered a normal husbandry practice.

- G) Other Management Practices

The Department shall approve the use of deep tillage for prime farmland and high capability land as a beneficial practice that will not restart the 5 year period of responsibility, if the following conditions are met:

- i) The permittee has submitted a request to use the practice and has identified the field that will be deep tilled;
- ii) One or more hay crops, or other acceptable row crops, have been grown or will be grown to dry out the subsoil prior to deep tilling the field; and
- iii) The Department has determined that the use of deep tillage will be beneficial to the soil structure and long term crop production of the field and the benefits will continue well beyond the responsibility period.

The Department shall notify the permittee in writing of its decision. Such written notice shall be in the form of an inspection report or other document issued by the Department.

- 3) Ground cover and production shall be considered equal to the approved success standard when they are not less than 90% of the success standard. The sampling techniques for measuring success shall use a 90% statistical confidence interval (i.e., one-sided t test with a 0.10 alpha error). Vegetative ground cover shall be measured using the technique set forth in 62 Ill. Adm. Code 1816.117(d). Standards for success shall be applied in accordance with the approved post-mining land use and, at a minimum, the following conditions:
 - A) The vegetative ground cover for areas previously disturbed by mining operations that were not reclaimed to the requirements 62 Ill. Adm. Code 1810 through 1828 and that are remined or otherwise redisturbed by surface coal mining operations, shall not be less than the greater of 70% or the percentage of ground cover existing before redisturbance, and shall be adequate to control erosion during the last year of the responsibility period;
 - B) 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 and shall not be less than 70%;

- C) For areas designated in the approved reclamation plan as cropland, except those cropland areas subject to 62 Ill. Adm. Code 1823.15, success of revegetation of cropland areas shall be determined in accordance with subsection (a)(4) or (a)(6). Crop production shall be considered successful if it is 90% of that crop production required in subsection (a)(4) or (a)(6) with 90% statistical confidence (i.e., one-sided t test with a 0.10 alpha error) for a minimum of any 2 crop years of a 10 year period prior to release of the performance bond, except the first year of the 5 year responsibility period. During the extended 5 year responsibility period, erosion from cropland must be minimized using equivalent or better management practices than surrounding unmined cropland. The 5 year responsibility period shall begin after the last year of augmented seeding, fertilizing, or soil treatment and at the time of the planting of the crops to be grown for the productivity showing or crops grown in rotation. Crop production for proof of productivity purposes shall be initiated within 10 years after completion of backfilling and final grading. All cropland shall be maintained using proper management practices as set forth in subsection (a)(2)(C) until the end of the responsibility period. Once chosen by the permittee, the productivity alternative in subsection (a)(6) may not be modified without approval from the Department;
- D) For areas to be developed for fish and wildlife habitat (including shelter belts), recreation, or forest products land uses, success of revegetation shall be determined on the basis of tree and shrub populations and ground cover. The tree and shrub population and ground cover shall meet the standards described in Section 1816.117;
- E) For areas designated as pasture and/or hayland or grazing land in the approved reclamation plan, except for erosion control devices and other structures (i.e., levees, ditches, waterways, impounding structures, etc.) productivity success (tons of grasses and/or legumes per acre) shall be determined in accordance with subsection (a)(4) or (a)(6). Productivity shall be considered successful if it is 90% of the productivity required in subsection (a)(4) or (a)(6) with 90% statistical confidence (i.e., one-sided t test

with a 0.10 alpha error) for a minimum of any 2 crop years of a 10 year period prior to release of the performance bond, except the first year of the 5 year extended responsibility period. All pasture, hayland and grazing land shall be maintained using proper management practices as set forth in subsection (a)(2)(C) until the end of the responsibility period. Production for proof of productivity purposes shall be initiated within 10 years after completion of backfilling and final grading. Ground cover shall be considered successful if it is 90% with 90% statistical confidence (i.e., one sided t test with a 0.10 alpha error) for a minimum of any 2 years of a 10 year period prior to the release of the performance bond, except the first year of the 5 year extended responsibility period. On high capability land, the Department shall allow the permittee to substitute corn production for hay production. If determined to be a proper management practice in accordance with subsection (a)(2)(C), the Department shall allow the permittee to substitute one year of crop production of an allowable crop specified in subsection (a)(4)(D) for one year of hay production on limited capability land. Once chosen by the permittee, the productivity alternative in subsection (a)(6) may not be modified without approval from the Department;

F) Non-contiguous areas less than or equal to 4 acres which were disturbed from activities such as, but not limited to, signs, boreholes, power poles, stockpiles and substations shall be considered successfully revegetated if the permittee can demonstrate that the soil disturbance was minor, i.e., the majority of the subsoil remains in place, the soil has been returned to its original capability and the area is supporting its approved post-mining land use at the end of the responsibility period.

4) In order to use the Agricultural Lands Productivity Formula, Appendix A of this Part, or the alternative in subsection (a)(6), to determine success of revegetation, the following shall apply:

A) The permittee shall submit annually, by February 15, a one inch equals 500 feet or larger scale drawing or aerial photograph delineating:

i) Field boundaries, a field numbering scheme and the total acreage for each field which will be cropped to demonstrate proof of productivity for the coming crop year. The

Department shall approve such submittal if the information is correct and accurate. Once field boundaries are established in a submittal, the boundaries shall not be changed without recommencing the responsibility period, unless the submittal is amended in accordance with subsection (a)(4)(A)(ii); and

- ii) The crop (e.g., hay, wheat, corn, soybeans, sorghum, etc.) which will be grown on each field to demonstrate proof of productivity for the coming crop year. The permittee may amend its scale drawing in accordance with 62 Ill. Adm. Code 1774.13(b)(2) until July 15 of the submittal year. Each such amendment shall contain a written explanation of changes from the original submittal and include a map reflecting the changes. A field is an area of land reclaimed by a single reclamation technique that comprises either high capability land or prime farmland or limited capability pasture land. The size of the field and its boundaries are determined by such factors which include, but are not limited to, contour, non-cropped boundaries and size of farming equipment.
- B) Fields identified in subsection (a)(4)(A) to be measured for success of revegetation for cropland shall be planted annually to a single approved crop. The sampling method of Appendix A shall apply. Soil and water conservation practices approved in the permit application including but not limited to grass waterways, diversion ditches, contour grass strips, and sedimentation ponds within the boundaries of a field shall be excluded from the sampling requirements of Section 1816. Appendix A and shall remain vegetated with permanent ground cover species, where appropriate, to conserve soil and water resources. Subject to rulemaking, the Department in cooperation with the Illinois Department of Agriculture may determine if a portion of a field is a representative sample of the entire field when technology has developed to make it possible through physical and chemical agronomic testing to demonstrate success of vegetation through soil surveys or when statistically valid sampling procedures are developed for determining success of revegetation based upon cropping and sampling a representative portion of the field.

- C) Adjustments for abnormal growing conditions shall be accepted by the Department if the adjustments are certified by a qualified professional (American Society of Agronomy certified) or National Association of State Departments of Agriculture crop enumerators used under this Section, whose ability to perform such adjustments has been previously approved by the Department.
 - D) The crops to be grown shall include those commonly grown on surrounding unmined cropland such as corn, soybeans, hay, sorghum or wheat. The Department may approve a hay crop use where this is a common use of unmined cropland in the surrounding area. Prime farmland and other cropland areas must include a minimum of one successful year of corn and if the Department has approved its use, a maximum of one successful year each of hay and wheat crops may be used for the productivity demonstration. If deep tillage has been completed to a minimum depth of 36 inches prior to bond release, the applicant may use more than one successful year of hay or wheat as a crop to be used for the productivity demonstration. The requirement for one successful year of corn remains unchanged under this subsection (a)(4)(D).
- 5) Wetland revegetation shall be deemed successful when:
- A) The wetland vegetation criteria in the Corps of Engineers Wetlands Delineation Manual (Department of the Army Technical Report Y-87-1, January 1987, published by the Department of the Army, Waterways Experiment Station, Corps of Engineers, P.O. Box 631, Vicksburg, Mississippi 39180-0631) have been achieved following sampling procedures specified in that manual, which does not include any later amendments or editions and is available for inspection and copying at the Department's Springfield office; and
 - B) Areas designed to support vegetation in the approved plan shall have a minimum areal coverage of 30%. The testing procedure in Section 1816.117(d)(1) through (3) shall be used to evaluate the extent of cover. Areal cover shall be determined to be present if any approved wetland species is measured at the increment. The percentage of areal cover shall be established for the area tested by taking the total number of measurements where areal cover was determined to be present.

- 6) In order to use the alternative to the Agricultural Lands Productivity Formula, Appendix A, to determine success of revegetation, the following shall apply: use of this alternative is contingent upon the permittee demonstrating for the entire field that the soil strength of the entire soil profile will average ≤ 200 psi or has been deep tilled to a minimum depth of 36 inches prior to bond release, and soil fertility will average Optimum Management for pH, P and K values as defined under the current Illinois Agronomy Handbook, and intensive land leveling is implemented, as needed, for the entire field. Areas to be tested are allowed under the provisions of subsections (a)(3)(C) or (E).

- A) The following substitution of Column F of Appendix A (County Average Yield File) shall read:

Column F is a derived optimum management production (see the equation below) obtained by multiplying the figures in Column D times the figures in Column E. This production figure will normally exceed actual production because the optimum level management yield is used. The purpose of using the optimum management production is to derive a weighted average optimum management yield that is the total optimum management production (Column F) divided by the total grain acres in the county (Column D). The weighted optimum management yield figure will be used to derive a "factor" as described below:

$$\text{Factor} = \frac{\text{Average of Official County Crop Yield for the Five Previous Years}}{\text{Average of Weighted Optimum Management Yield for the Five Years}}$$

- B) When the factor derived in subsection (a)(6)(A) and hand sampling are used, the harvest loss will be calculated by averaging the harvest loss of the 5 previous years for the crop being tested.

- b) The person who conducts surface mining activities shall:

- 1) Conduct periodic measurements of vegetation, soils, and water prescribed or approved by the Department, to identify if remedial actions are necessary during the applicable period of liability specified in subsection (a); and

- 2) Initiate a soil compaction and fertility testing plan, subject to the approval of the Department, for areas that have incurred 5 unsuccessful attempts to meet the production required by subsection (a)(3)(C) or (E) or 62 Ill. Adm. Code 1823.15, or shall initiate deep tillage on the areas.
- 3) Permittees shall submit by February 15 of each year a report of reclamation activities conducted during the previous calendar year, which initiate or may alter the responsibility period or are specifically required by the Department to evaluate a normal husbandry practice, using forms provided by the Department. Examples of reclamation activities to be reported and/or evaluated include but are not limited to crops used in temporary and permanent seedings, grasses and legumes planted, trees and shrubs planted, soil amendments added, and location and type of augmentation activities. The forms shall be submitted with a copy of the approved post-mining land use and capability map depicting the location of such activities. The map shall be planned as a continuous map so the reclamation activities conducted each year may be added and indicated on the map by the dates the activities were conducted.

(Source: Amended at 29 Ill. Reg. 10599, effective July 7, 2005)

Section 1816.117 Revegetation: Tree, Shrub, and Herbaceous Wildlife Vegetation

- a) For areas to be developed for fish and wildlife habitat (including shelter belts), recreation, or forest products land uses, success of vegetation shall be determined on the basis of tree and shrub population and vegetative ground cover. Such parameters are described as follows:
 - 1) Trees and shrubs that will be used in determining the success of vegetation and the adequacy of plant arrangement shall have utility for the approved post-mining land use. Tree and/or shrub population shall be considered successful if it meets the population required in subsection (b) below with 90% statistical confidence (i.e., one-sided t test with a 0.10 alpha error) during the fifth year of the responsibility period or later in the responsibility period. On lands eligible for re-mining, the period of responsibility (until September 30, 2004) shall be 2 full years. Trees and shrubs counted in determining such success shall be healthy, e.g. not demonstrating abnormal growth, coloring, leaf drop or disease. At the time of bond release such trees and shrubs shall be alive, and shall have been in place for at least 3 growing seasons, i.e. 3 years. Until September 30, 2004, on lands eligible for re-mining, trees and shrubs need not have been in place for 3 years; however, such trees and shrubs shall not be counted in

- determining success during the same calendar year in which they were planted.
- 2) Vegetative ground cover shall not be less than required to achieve the approved post-mining land use and shall be adequate to control erosion and shall not be less than 70% during the last year of the responsibility period.
 - 3) Permanent roads, parking lots and similar impervious structures on the revegetated area shall not require the planting of trees and shrubs or herbaceous ground cover. Erosion control structures, including pond embankments, shall not require the planting of trees and shrubs.
 - 4) For purposes of this Section, herbaceous species means: grasses, legumes and nonleguminous forbs; woody plants means woody shrubs, trees and vines; and ground cover means the area of ground covered by the combined above ground parts of vegetation and the litter that is produced naturally on site.
 - 5) For purposes of this Section, normal husbandry and conservation practices shall include pruning, disease, pest, vermin and herbaceous vegetation control including mowing, replanting and rill and gully repairs. The replanting of trees and shrubs in areas described in Section 1816.116(a)(2)(C) shall be limited to 20% of the original approved planting rate during the first year of the responsibility period and 10% of the original approved planting rate during the second year of the responsibility period. The repair of rills and gullies shall be limited to those approved as a normal conservation practice under Section 1816.116(a)(2)(C), (D) and (E).
- b) For areas where woody plants are used for fish and wildlife habitat (including shelter belts), or recreation land uses, the area shall have a minimum population of 250 trees or shrubs per acre. Planting arrangements such as hedgerows, border plantings, clump plantings, shelterbelts, and open herbaceous areas which increase diversity within wildlife areas may be approved by the Department on a case-by-case basis prior to planting such areas. Where woody plants are used for forest products land uses, the area shall have a minimum population of 450 trees or shrubs per acre.
 - c) For areas planted to trees or shrubs including wildlife habitat (including shelter belts), recreation, and forest products land uses, the sampling procedure for measuring populations is described as follows:

- 1) The permittee shall submit a scale drawing or aerial photograph delineating the fields to be sampled and the total number of acres in each field. A one inch equals 500 feet or larger scale shall be used. Once field boundaries are established in a submittal, the boundaries shall not be changed unless the Department approves a request in accordance with 62 Ill. Adm. Code 1774.13.
- 2) One of the following circular plot sizes shall be selected by the sample enumerator:

Plot Size/Acres	Radius/Feet
1/160	9.31
1/120	10.75
1/100	11.78
1/90	12.41
1/80	13.17
1/70	14.07
1/60	15.20
1/50	16.65
1/40	18.61
1/30	21.50
1/20	26.33
1/10	37.24
1/5	52.66
1/4	58.88

- 3) The number of plots needed to sample 2.5% of the area will be calculated employing the following formula:
 Number of Plots equals 2.5% multiplied by Sample Area in acres divided by plot size.
- 4) Based on the number of plots needed to be sampled and plot size, locate transect lines an equal distance apart throughout the area to be sampled. Position individual plots an equal distance apart along transect lines. Determine the total length of all transect lines combined and then divide by the total number of plots needed to be sampled. When an individual plot is positioned within 60 feet of the boundary of the area to be sampled, the location of the plot shall be moved perpendicular to the transect line until the plot is 60 feet from the boundary of the area to be sampled or the greatest distance possible where 60 feet cannot be achieved.

- 5) Sample each plot for compliance with subsections (a)(1) and (b) and record live trees and/or shrubs and species.
 - 6) Calculate population levels as follows:
 - A) Average number of live trees and/or shrubs per plot equals total number of live trees and/or shrubs divided by number of plots; and
 - B) Number of live trees and/or shrubs per acre equals average number of live trees and/or shrubs per plot multiplied by plot size denominator.
 - 7) Representatives of the Department shall administer all sampling.
- d) Vegetative ground cover shall be measured by the following technique:
- 1) Twenty random points shall be identified in the area to be tested.
 - 2) A 20 feet engineer's tape shall be extended directly south of each point. If the tape extends beyond the boundary of the area to be tested or extends into an area where herbaceous ground cover has been controlled with herbicides to minimize competition with woody plants, the tape shall be rotated in 90 degree increments until the entire 20 feet length is within the boundary of the area to be tested or area not treated with the herbicide.
 - 3) A measurement shall be taken at each .2 foot increment directly above or below the tape.
 - 4) Ground cover shall be determined to be present if any vegetation identified in subsection (a)(4) is measured at the increment.
 - 5) A percentage of ground cover shall be established for the area tested by taking the total number of measurements where ground cover was determined to be present.
- e) For areas where herbaceous vegetation plants are used for fish and wildlife habitat (including shelterbelts), or recreation land uses, vegetative ground cover of approved species shall not be less than required to achieve the approved post-mining land use and shall be adequate to control erosion and shall not be less than 70% during the last year of the responsibility period. Planting arrangements such as hedgerows, border plantings, clump plantings, shelterbelts, and open

herbaceous area that increase diversity within wildlife areas may be approved by the Department on a case-by-case basis prior to planting those areas.

(Source: Amended at 26 Ill. Reg. 4232, effective March 6, 2002)

Section 1816.131 Cessation of Operations: Temporary

- a) Each person who conducts surface mining activities shall effectively secure surface facilities in areas in which there are no current operations, but in which operations are to be resumed under an approved permit. Temporary abandonment shall not relieve a person of their obligation to comply with any provisions of the approved permit.
- b) Before temporary cessation of mining and reclamation operations for a period of thirty (30) days or more, or as soon as it is known that a temporary cessation will extend beyond thirty (30) days, persons who conduct surface mining activities shall submit to the Department a notice of intention to cease or abandon mining and reclamation operations. This notice shall include a statement of the exact number of acres which will have been affected in the permit area, prior to such temporary cessation, the extent and kind of reclamation of those areas which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, and water treatment activities that will continue during the temporary cessation.

Section 1816.132 Cessation of Operations: Permanent

- a) Persons who cease surface mining activities permanently shall close or backfill or otherwise permanently reclaim all affected areas, in accordance with this Chapter and the permit approved by the Department.
- b) All underground openings, equipment, structures, or other facilities not required for monitoring, unless approved by the Department as suitable for the post mining land use or environmental monitoring, shall be removed and the affected land reclaimed.

Section 1816.133 Post-Mining Land Capability

- a) All disturbed areas shall be restored in a timely manner to a condition capable of supporting:
 - 1) The uses which they were capable of supporting prior to any mining; or

- 2) Higher or better uses of which there is a reasonable likelihood of restoration: Provided that, no plan of restoration shall be approved unless use of the area as proposed does not:
 - A) Present any actual or probable hazard to public health or safety;
 - B) Pose any actual threat of diminution or pollution pursuant to Section 1816.41; or
 - C) That the proposed land use following restoration is not found to be impracticable or unreasonable by the Department or determined by the Department to be inconsistent with land use policies and plans which are applicable, or to involve unreasonable delay in implementation. No restoration plan shall be approved if the proposed land use following reclamation is violative of other applicable law.
- b) The premining capability of land to which the post-mining land capability is compared shall be the capabilities that the land would have supported if it had not been previously mined and had been properly managed. The post-mining land capability for land that has been previously mined and not reclaimed shall be judged on the basis of the land capability that existed prior to any mining: provided that, if the land cannot be reclaimed to the land capability that existed prior to any mining because of the previously mined condition, the post-mining land capability shall be judged on the basis of the highest and the best capability that can be achieved which is compatible with surrounding areas and does not require the disturbance of areas previously unaffected by mining. Quantification of land capability is to be done on the basis of acreage summaries for each land capability category, as defined in 62 Ill. Adm. Code 1701.5. The total acreage for each land capability category should approximate the corresponding premining acreage. Changes in total acreage from one land capability class to another shall require approval in accordance with Section 1816.133(a)(2).
- c) In determining the capability of affected land, the Department shall use as a guideline the handbook entitled: Land Capability Classification, Agriculture Handbook No. 210, published by the Natural Resources Conservation Service of the U.S. Department of Agriculture. A copy of this handbook shall be on file with the Department and the Secretary of State. Interested persons may present views respecting the capability of affected lands in the due course of the Department's review of the permit application.

(Source: Amended at 20 Ill. Reg. 2027, effective January 19, 1996)

Section 1816.150 Roads: General

- a) Road classification system.
 - 1) Each road, as defined in 62 Ill. Adm. Code 1701. Appendix A, shall be classified as either a primary road or an ancillary road.
 - 2) A primary road is any road which is:
 - A) Used for transporting coal or spoil;
 - B) Frequently used for access or other purposes for a period in excess of six months; or
 - C) To be retained for an approved post-mining 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 as well as 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 their habitat and related environmental values;
 - 3) Control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area;
 - 4) Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standards 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 Department.
 - 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 Department in accordance with applicable sections of 62 Ill. Adm. Code 1816.41 through 1816.43 and 1816.57.
 - 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 Section in accordance with prudent engineering and maintenance practices.
 - 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 post-mining 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 post-mining land use;
- 3) Removing or otherwise disposing of road-surfacing materials that are incompatible with the post-mining land use and revegetation requirements;
- 4) Reshaping cut and fill slopes as necessary to be compatible with the post-mining 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 62 Ill. Adm. Code 1816.22 and 1816.111 through 1816.117.

(Source: Amended at 15 Ill. Reg. 17166, effective January 1, 1992)

Section 1816.151 Primary Roads

Primary roads shall meet the requirements of Section 1816.150 and the additional requirements of this Section.

- a) **Certification.** The construction or reconstruction of primary roads shall be certified in a report submitted to the Department by a qualified registered professional engineer within thirty (30) days after completion of construction. For purposes of this Section, completion of construction shall mean the road is being used for its intended purpose as determined by the Department. The professional engineer shall be experienced in the design and construction of roads, as evidenced by the placement of a registered professional engineer's seal on the report. 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 be shown to have a minimum static factor of safety of 1.3, or shall be designed in compliance with the following design standards:
 - 1) The embankment foundation area shall be cleared of all organic material and the entire foundation surface shall be scarified;

- 2) If the natural slope of the foundation as measured at right angles to the roadway center line is steeper than 8H:1V, the embankment shall be benched into the existing slope beginning at the embankment toe and then filled with compacted level lifts;
 - 3) The embankment fill material shall be free of sod, large roots and other large vegetative matter;
 - 4) The fill shall be brought up in horizontal layers of such thickness as required to facilitate compaction in accordance with prudent construction standards;
 - 5) The moisture content of the fill material shall be sufficient to secure proper compaction;
 - 6) The side slopes of the embankment shall be no steeper than 2H:1V;
 - 7) Maximum fill height shall be twenty-five (25) feet as measured from natural ground at the downstream toe to the top of the embankment;
 - 8) Embankments shall have a minimum top width of $(H + 35)/5$, where "H" is the embankment height as measured from natural ground at the downstream toe to the top of the embankment, and shall be adequate for the intended use.
- 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 Department 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 Department

as necessary to ensure proper drainage control design in accordance with prudent engineering practices;

- 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 Department in accordance with applicable sections of 62 Ill. Adm. Code 1816.41 through 1816.43 and 1816.57; and
 - 6) Except as provided in subsection (c)(2) above, 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 Department 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 Department as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

(Source: Amended at 20 Ill. Reg. 2027, effective January 19, 1996)

Section 1816.180 Utility Installations

All surface coal mining operations 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 Department.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.181 Support Facilities

- a) Support facilities shall be operated in accordance with a permit issued for the mine or coal preparation operation 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:
 - A) Minimizes damage to fish, wildlife and related environmental values; and
 - B) Minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any such contributions shall not be in excess of the limitations of Section 1816.42.

(Source: Amended at 11 Ill. Reg. 8131, effective July 1, 1987)

Section 1816.190 Affected Acreage Map

- a) On or before September 1 of each year every permit holder shall submit to the Department reports and maps of affected areas.
- b) Two copies, plus one additional copy for each county in which the permit is located, of the reports and maps shall be submitted showing the area affected during the fiscal year just ended and the extent of any auger mining. One of the copies submitted shall contain the original signature of a company official. The Department shall require the map to be executed by an engineer registered in accordance with the Professional Engineering Practice Act of 1989 [225 ILCS 325] or a land surveyor registered in accordance with the Illinois Professional Land Surveyor Act of 1989 [225 ILCS 330]. The Department shall then forward one copy to the county clerk.
- c) The map shall be planned as a continuous map, so that the area affected each year may be added and indicated on the map by the dates it was affected. Reports as required by Section 1816.190 shall be submitted to the Department on forms

provided by the Department. Map scales shall be in accordance with 62 Ill. Adm. Code 1779.25.

- d) All maps shall show sections, township, range and county lines coming within the scope of the map; access to the area from the nearest public road and all weather roads within the mined area; and a title containing name of the operator, address, scale of the map, by whom the map was drawn, name of the surveyor or engineer.

(Source: Amended at 26 Ill. Reg. 4232, effective March 6, 2002)

Section 1816.APPENDIX A Agricultural Lands Productivity Formula

SOIL MASTER FILE

The Soil Master File of the Agricultural Lands Productivity Formula contains a comprehensive list of the soil mapping units currently recorded in Illinois. The Soil Master File provides the soil mapping unit number, common mapping name, and the optimum level of management yields for corn, soybeans, wheat and mixed hay. The Soil Master File is created annually by the Illinois Department of Agriculture, pursuant to 20 ILCS 205/115. The reference document for information contained in the soil master file shall be Bulletin 811, "Optimum Crop Productivity Ratings for Illinois Soil," University of Illinois, College of Agricultural, Consumer and Environmental Sciences, Office of Research, August 2000.

COUNTY CROPPED ACREAGE FILE

The Agricultural Lands Productivity Formula requires that the number of cropped acres by soil mapping unit be calculated for each county. These calculations are generated by computer using the following formula:

$$\begin{array}{rcccl} \text{Total acres per} & & \text{percent of} & & \text{acres per} \\ \text{soil type per} & \times & \text{total acreage} & = & \text{soil type} \\ \text{county} & & \text{cropped} & & \text{cropped} \end{array}$$

The percent of total acreage cropped per soil type will be provided by County Soil and Water Conservation Districts. Any changes to these figures must be approved by the County Soil and Water Conservation District Board with a certified copy of all changes submitted by August 15 of each year to the Illinois Department of Agriculture.

The County Cropped Acreage File reflects the total acres of each soil type per county, percent of acreage cropped, and the computed figure of total cropped acres by soil type in each county. The "total cropped acres" figures are carried forward to the County Average Yield File. The County

Cropped Acreage File is created annually by the Illinois Department of Agriculture, pursuant to 20 ILCS 205/115.

COUNTY AVERAGE YIELD FILE

The next procedure of the Agricultural Lands Productivity Formula is to equate annual county crop yield data to the soils derived in the "County Cropped Acreage File". Section 1816.Exhibit A and the following paragraphs summarize the procedure for calculating the crop yield for each soil mapping unit.

Column A reflects the soil mapping units as they appear on a county by county basis.

Column B is the number of acres cropped in a county per soil type as recorded in the County Cropped Acreage File. These cropped acreage figures are then added together to give a total number of acres cropped for the county.

Column C is the percent of the acreage represented by each soil type when compared with the total in Column B (Column B = total acres in soil mapping unit times the percent of acres cropped in the county by mapping unit).

The number of acres planted in grain (Column D) is calculated by multiplying the percent of each soil mapping unit in the county (Column C) by the total acres in the county harvested for corn, soybeans, wheat and mixed hay. (See asterisk in Section 1816.Exhibit A.) The purpose of this calculation is to estimate the number of acres harvested from each of the particular soil mapping units. It is assumed that 25% of the total corn, soybean, wheat and mixed hay acreage was planted on that particular soil mapping unit. Therefore, the "grain acres" are distributed on the soil mapping units based upon the percent of acres in each soil mapping unit.

Column E is the adjusted yield information for each crop which comes from the Soil Master File.

Column F is a derived optimum management production (see the equation below) obtained by multiplying the figures in Column D times the figures in Column E. This production figure will normally exceed actual production because the optimum level management yield is used. The purpose of using the optimum management production is to derive a weighted average optimum management yield; which is, the total optimum management production (Column F) divided by the total grain acres in the county (Column D). The weighted optimum management yield figure will be used to derive a "factor" as described below:

$$\text{Factor} = \frac{\text{Official County Crop Yield}}{\text{Weighted Optimum Management Yield}}$$

Column G results from the multiplication of the above factor times the optimum level management yield of each soil mapping unit (Column E). The result is a yield which represents

the average yield in either bushels per acre or tons per acre in the county for that year and crop. If official county crop yields are unavailable for a specific crop in a given year, the Department, in consultation with the permittee, and with the concurrence of the Illinois Department of Agriculture, will substitute a county crop yield from an adjacent county with similar soils, if it can be determined that similar weather conditions occurred in that year.

PERMIT SPECIFICS--YIELD STANDARD

- a) After completing calculations for the projected yield of the test year in question, a yield standard for each capability class in the disturbed area in the pit must be calculated. The yield standard, which is also applicable to high capability and limited capability land will be calculated in a manner similar to prime farmland.
- b) The number of prime farmland acres in each soil mapping unit will be divided by the total prime farmland acres in the pit to obtain a weighted proportion for each soil type. The weighted proportion of each prime farmland soil mapping unit in the pit, relative to the total prime farmland acres in the pit, will be multiplied times the projected yield for the pre-mining soil types. The weighted final yield for each prime farmland soil type in a pit will be added together and the total becomes the yield requirement for the pit.
- c) After mining operations have ceased, the Department shall recalculate the yield standards for the pit based solely on the soils which were disturbed. Recalculated targets shall be applicable to all areas tested for productivity subsequent to the recalculation. Approved significant revisions after permanent cessation of mining shall cause the targets to be recalculated and applied to productivity fields tested after the recalculation.

AGRICULTURAL LANDS PRODUCTIVITY FORMULA SAMPLING METHOD

The sampling methodology that the Illinois Department of Agriculture or the Illinois Department of Natural Resources will use to gather the data needed to determine if productivity has been returned to reclaimed mine land is summarized below for corn, soybeans, wheat, sorghum, and mixed hay.

This sampling methodology requires an operator to submit by February 15 of each year, a scale drawing or aerial photo delineating specific field boundaries and type of crop which is to be sampled for proof of productivity for the current crop year. Each scale drawing and photo submitted shall include a field numbering scheme and the total acreage for each field on which sampling is being requested. In addition, the scaled drawing shall be no less than 1 inch equals 500 feet or greater than 1 inch equals 100 feet. The February 15 annual submittal may be amended by the operator until July 15. Each such amendment shall contain a written explanation

of changes from the original submittal and an aerial photograph or scaled drawing reflecting the corrected sampling submittal.

The determination of sample points within a specific field will be made on the basis of a grid overlay scheme with the location of sample points on the grid randomly generated by computer. An intentional bias of 50 feet will be introduced to all field boundaries to remove the potential that sampling points may fall in turn around areas, or areas where contiguous soil reconstruction may cause field boundaries to not be indicative of whole field productivity.

The minimum acceptable number of samples to be taken relative to field size is shown in Section 1816. Table D sample points per crop acres, with fields of 4 acres or less to be sampled in their entirety with yields determined by harvest weight. Sample selections will take place using the following guidelines.

The Illinois Department of Agriculture may elect to increase the minimum number of acceptable sample points per field acres. Some factors which will be considered in determining whether to increase the number of sample points are as follows, but not limited to:

1. Operator requests additional sample points for specific fields.
2. The use of different hybrids in one field.
3. Contour changes within one field which would alter a yield.
4. A coefficient of variation greater than 15%.

The Department and the Illinois Department of Agriculture shall jointly request the operator to verify yields by harvest weight (e.g., scale tickets) for reasons, including but not limited to:

1. Verification of random sampling results.
2. Availability of sample enumerators.

In each such case, the certified harvest yield adjusted, to optimum moisture content, will become the comparison yield for the Agricultural Lands Productivity Formula target yield.

CORN SAMPLING TECHNIQUE

Step 1- Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.

- Step 2- Pace off predetermined sample point coordinates in a sequential fashion to determine individual sample locations.
- Step 3 - After taking the last of the required paces to the first sampling point, place a stake immediately adjacent to the closest corn stalk to the toe of your shoe. Measure 15 feet of the corn row starting at the first stake and placing a second stake at the 15 foot mark.
- Step 4 - Determine the 3rd and 4th ears of the first row starting with the first stalk of corn. Tag these ears with a rubber band. If there are fewer than 4 ears in the first row, the last ear and the next to last ear should be tagged. In the case where a stalk has more than one ear, count the top ear first. (Note: An ear of corn is defined as a cob having at least one kernel. The tagged ears will be used to determine the moisture content, and at least 250 grams of grain are needed. If it does not appear that the 3rd and 4th ears will supply 250 grams of grain for a moisture test, then the 5th, 6th and/or 7th ear should be included until at least 250 grams of corn is collected.)
- Step 5 - Husk all ears in Row 1 within the 15 foot segment of the sample. Husk the ears and snap the shank off as cleanly as possible. Be sure to include any ears tagged for moisture testing.
- Step 6 - Weigh the husked ears using a balance scale - obtain field weight in pounds.
- Step 7 - After weighing, put ears tagged for moisture testing into polyethylene bags and seal. Mark the bag with the appropriate field number (as supplied by the mine operator), and sample identification number.
- Step 8 - Measure on a perpendicular line from the stalks in row one to the stalks in row 5. Divide this measured distance by 4 to determine the average row width.
- Step 9 - Repeat Steps 3 through 8 for each additional random sampling point coordinate.
- Step10 - Send or deliver to the Illinois Department of Agriculture any grain sample collected for moisture content analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C.)

The following method will be used for determination of gross yield of corn samples. Gross yield is determined by deducting the adjustment for moisture content of shelled corn from the harvest weight. Moisture content of the grain sample will be determined by lab analysis.

$$\text{Gross Yield} = \text{Harvest Weight adjusted for moisture content.}$$

Included below for reference is the Gross Yield formula and an explanation of its components.

$$\text{Gross Yield} = \frac{A \times B \times C}{D \times E \times F}$$

Per Acre
bu/ac

Where: A = Field weight of husked ears of corn from 15 feet of row x 2 (2 Rows x 15 feet)

B = Weight of shelled grain at time of moisture test

C = Percent moisture in grain corrected to 15.5%

$$= 1.0 - (\% \text{ moisture in grain} / 100\%)$$

.845

D = Weight of ears of Corn used for moisture determination

E = Row Factor

$$\text{Average row width in feet} \times 15 \text{ feet of row} \div 43560 \text{ square feet/acre}$$

and .845 = The standard moisture content conversion factor of corn per bushel (1.0 - (15.5% / 100))

F = Weight of standard bushel of corn = 56 lbs.

After calculation of the gross yield, the statewide Harvest Loss will be subtracted from the gross yield to obtain a net yield per sample. Harvest Loss is the difference between actual grain yield and what is hauled from a field. The net yield determinations for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity.

SOYBEAN SAMPLING TECHNIQUE DRILLED OR PLANTED BEANS (>8" rows)

Step 1 - Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.

Step 2 - Pace off predetermined sample point coordinates in a sequential fashion to determine individual locations.

- Step 3 - After taking the last of the required paces to the first sampling point, mark the closest plant to the toe of your foot. Place a flag at the point that you have just marked. From the point of this flag, and in the direction of travel from where the last pace was counted, measure a distance of 6 feet of plant row and place a flag at the 6 foot mark. Starting from the row just identified, measure the distance across 5 rows. This distance, from row one to row 5, divided by 4 row spaces gives the average row width.

- Step 4 - Strip all the soybean pods from all the plants in the 6 foot sample row. Pick up any loose pods or beans found on the ground at the base of these plants. Deposit all the pods, beans and blank pods, into a paper sack. Mark the sack with the appropriate field number (as provided by the mine operator), and sample identification number. Secure the sample sack to prevent any sample loss. (Note: If sample weight is less than the 250 grams needed for the moisture test, sufficient grain of known moisture content will be added to the sample so that moisture tests can be made.)

- Step 5 - Repeat steps 3 and 4 for each additional random sampling point coordinate.

- Step 6 - Send or deliver to the Illinois Department of Agriculture any grain sample collected for moisture content analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C.)

The following method will be used for determination of gross yield of soybean samples. Gross yield is determined by deducting the adjustment of moisture content of the soybean sample from the harvest weight. Moisture content determinations will be made by lab analysis.

Gross Yield = Harvest Weight adjusted for moisture content.

Included below for reference is the Gross Yield formula and an explanation of its components.

$$\begin{array}{l} \text{Gross Yield} \\ \text{Per Acre} \\ \text{(bu/acre)} \end{array} = \frac{A \times B}{C \times D \times E}$$

- Where: A = Weight of shelled grain from 6 feet of row

- B = Percent moisture in grain corrected to 12.5%

- = (1.0 - (% moisture in shelled beans/100%))

0.875

- C = Number of grams per pound = 453.6
- D = Correction factor for row spacing on drilled or planted beans
= Average row width in ft x 6 ft of row
43560 sq ft/acre
- E = Standard weight of 1 bushel of soybeans = 60 lbs

After calculation of the gross yield, the statewide Harvest Loss as calculated by the Illinois Agricultural Statistics Service will be subtracted from the gross yield to obtain a net yield per sample. Harvest loss is the difference between actual grain yield and what is hauled from a field. The net yield determination for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity.

SOYBEAN SAMPLING TECHNIQUE
DRILLED OR PLANTED (<8" rows)

- Step 1 - Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.
- Step 2 - Pace off predetermined sample point coordinates in a sequential fashion to determine individual sample locations.
- Step 3 - After taking the last of the required paces to the first sampling point, lay down a sampling frame so that it touches the toe of your shoe, crossing the crop rows at a right angle. Mark the 2 ends of the sampling frame with stakes just inside the 3.0 foot sampling tines. Continue to lay out the sample area in the direction of travel from where the last pace was counted. Rotate the sampling frame so that it is perpendicular to one corner of the stake (previously marked), and at a right angle to the original frame position. (Note: If at any time the point of a tine is restricted by a soybean plant, slide the soybean frame toward the starting point far enough for the point of the tine to clear the plant.) Repeat this procedure to lay out the other 2 sides of the sampling square, using the opposite corner of the original frame position to find the other 2 sides.
- Step 4 - Strip all the soybean pods from all the plants in the 9 square feet sampling area. Pick up any loose pods or beans found on the ground. Deposit all the pods, beans and blank pods into a paper sack. Mark the sack with the appropriate field number (as provided by the mine operator), and sample identification number. Secure the

sample sack to prevent any sample loss. (Note: If sample weight is below 250 grams for the moisture test, grain of known moisture content will be added to the sample so that moisture tests can be made.)

Step 5 - Repeat steps 3 and 4 for each additional random sampling point coordinate.

Step 6 - Send or deliver to the Illinois Department of Agriculture any grain sample collected for moisture content analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C.)

The following method will be used for determination of gross yield of soybean samples. Gross yield is determined by deducting the adjustment for moisture content of the soybean sample from the harvest weight. Moisture content of the grain sample will be determined by lab analysis.

Gross Yield = Harvest Weight adjusted for moisture content

Included below for reference is the Gross Yield formula and an explanation of its components.

$$\text{Gross Yield Per Acre} = \frac{A \times B \times C}{D}$$

(bu/acre)

Where: A = Total weight of all beans in 9 sq. ft. grid (in grams)

B = Conversion factor = $\frac{43560 \text{ sq. ft./ac.}}{453.6 \text{ gms/lb} \times 60 \text{ lbs/bu} \times 9 \text{ sq. ft.}}$

C = 1.0 - (% moisture in shelled beans/100%)

D = .875 = The standard moisture content conversion factor of soybeans per bushel (1.0 - (12.5%/100%)).

After calculation of the gross yield, the Harvest Loss will be subtracted from the gross yield to obtain a net yield per sample. Harvest Loss is the difference between actual grain yield and what is hauled from the field. The net yield determinations for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity.

WHEAT SAMPLING TECHNIQUES
(ROWS <8 INCHES)

- Step 1 - Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.
- Step 2 - Pace off predetermined sample point coordinates in a sequential fashion to determine individual sample location.
- Step 3 - After taking the last of the required paces to the first sampling point, lay down a sampling frame so that it touches the toe of your shoe, crossing the crop rows at a right angle. Mark the 2 ends of the sampling frame with stakes just inside the 1.8 feet sample tines. Continue to lay out the sample area in the direction of travel from where the last pace was counted. Rotate the sampling frame so that it is perpendicular to one corner of the stake (previously marked) and at a right angle to the original frame position. Repeat this procedure to lay out the other 2 sides of the sampling square using the opposite corner of the original frame position to find the other 2 sides.
- Step 4 - Clip all wheat heads from within the square outlined by the sampling frame. The wheat heads should be clipped approximately 1/2 inch below the bottom of the head. Deposit all the collected wheat heads into a paper sample sack. Mark the sack with the appropriate field number (as supplied by the mine operator), and sample identification number. Secure the sample sack to prevent any sample loss. (Note: If sample weight is below 250 grams for the moisture test, grain of known moisture content will be added to the sample so that moisture tests can be made.)
- Step 5 - Repeat steps 3 and 4 for each additional random sampling point coordinate.
- Step 6 - Send or deliver to the Illinois Department of Agriculture grain sample collected for moisture content analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C).

The following method will be used for determination of gross yield of wheat samples. Gross yield is determined by deducting the adjustment for moisture content of the wheat sample from the harvest weight. Moisture content of the grain sample will be determined by lab analysis.

Gross Yield = Harvest Weight adjusted for moisture content. Included below for reference is the Gross Yield formula and an explanation of its components.

$$\text{Gross Yield Per Acre} = \frac{A \times B \times C}{D}$$

(bu/acre)

Where: A = Sample wt. of wheat in grams

$B = 1.0 - (\% \text{ moisture in grain}/100\%)$

$C = \text{Conversion factor}$

$= \frac{43560 \text{ sq. ft./ac}}{(60 \text{ lbs/bu} \times 453.6 \text{ gms/lb} \times 3.24 \text{ sq. ft.})}$

$= .4940 \text{ bu/gm acre}$

$D = .880 = \text{The standard moisture content conversion factor of wheat per bushel } (1.0 - (12\%/100\%))$

After calculation of the gross yield, the Harvest Loss will be subtracted from the gross yield to obtain a net yield per sample. Harvest Loss is the difference between actual grain yield and what is hauled from a field. The net yield determinations for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity.

WHEAT SAMPLING TECHNIQUES (Discernible Rows)

- Step 1 - Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.
- Step 2 - Pace off predetermined sample point coordinates in a sequential fashion to determine individual sample location.
- Step 3 - After taking the last of the required paces to the first sampling point, lay down a sampling frame so that it touches the toe of your shoe, crossing the crop rows at a right angle. Mark the 2 ends of the sampling frame with stakes just inside the 1.8 feet sample tines. Continue to lay out the sample area in the direction of travel from where the last pace was counted. Rotate the sampling frame so that it is perpendicular to one corner of the stake (previously marked), and at a right angle to the original frame position. Repeat this procedure to lay out the other 2 rows to be sampled. (Total 3 rows) Note: The row spacing will be determined by measuring across 5 row spaces to obtain an average (i.e. the distance in row 1 to 5 / 4).
- Step 4 - Clip all wheat heads from within the square outlined by the sampling frame. The wheat heads should be clipped approximately 1/2 inch below the bottom of the head. Deposit all the collected wheat heads into a paper sample sack. Mark the sack with the appropriate field number (as supplied by the mine operator), and sample identification number. Secure the sample sack to prevent any sample loss.

(Note: If sample weight is below 250 grams for the moisture test, grain of known moisture content will be added to the sample so that moisture tests can be made.)

- Step 5 - Repeat steps 3 and 4 for each additional random sampling point coordinate.
- Step 6 - Send or deliver to the Illinois Department of Agriculture any grain sample collected for moisture content analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C.)

The following method will be used for determination of gross yield of wheat samples. Gross yield is determined by deducting the adjustment for moisture content of the wheat sample from the harvest weight. Moisture content of the grain sample will be determined by lab analysis.

Gross Yield = Harvest Weight adjusted for moisture content

Included below for reference is the Gross Yield formula and an explanation of its components.

$$\text{Gross Yield Per Acre} = \frac{(A \times B \times C)}{D}$$

(bu/acre) D

Where: A = Sample wt. of wheat in grams

B = 1.0 - (% moisture in grain/100%)

C = Conversion factor

$$= \frac{43560 \text{ sq. ft/ac}}{(60 \text{ lbs/bu} \times 453.6 \text{ gms/lb} \times \text{no. of rows harvested} \times 1.8 \text{ ft} \times \text{average row spacing (ft)})}$$

D = .880 = The standard moisture content conversion factor of wheat per bushel (1.0 - (12%/100%)).

After calculation of the gross yield, the statewide Harvest Loss will be subtracted from the gross yield to obtain a net yield per sample. Harvest Loss is the difference between actual grain yield and what is hauled from the field. The net yield determinations for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity.

SORGHUM SAMPLING TECHNIQUE

- Step 1 - Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.
- Step 2 - Pace off predetermined sample point coordinates in a sequential fashion to determine individual sample locations.
- Step 3 - After taking the last of the required paces to the first sampling point, place a stake immediately adjacent to the closest sorghum plant to the toe of your shoe. Measure 10 feet of the plant row starting at the first stake and placing a second stake at the 10 foot mark. Mark the first 5 heads and the last 5 heads with rubber bands. These heads will be used for moisture determination. One sample unit will equal one 10 foot sorghum row section.
- Step 4 - Clip all grain heads in Row 1 within the 10 foot segment of the sample unit.
- Step 5 - Weigh the clipped grain heads using a balance scale; obtain field weight to the nearest tenth of a pound. Place any grain heads collected for moisture determination into sealed polyethylene bags. Mark the bags with the appropriate field number (as supplied by the mine operator), and sample identification number.
- Step 6 - Measure on a perpendicular line from the plants in row one to the plants in row 5. Divide this measured distance by 4 to determine the average row width.
- Step 7 - Repeat steps 3 through 6 for each additional random sampling point coordinate.
- Step 8 - Send or deliver to the Illinois Department of Agriculture any grain sample collected for moisture content analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C.)

The following method will be used for determination of gross yield of sorghum samples. Gross yield is determined by deducting the adjustment for moisture content of the threshed grain from the harvest weight. Moisture content of the grain samples will be made by lab analysis.

Gross Yield = Harvest Weight adjusted for moisture content

Included below for reference is the Gross Yield formula and an explanation of its components.

$$\text{Gross Yield (bu/ac)} = \frac{(A \times B \times C)}{(E \times F) \times D}$$

Where: A = Field weight of grain heads of sorghum from 10 feet of row x 2 (2 rows x 10 feet)

B = Weight of threshold grain at time of moisture test

C = Percent moisture in grain corrected to 13.0%

$$= 1.0 - (\% \text{ moisture in grain} / 100\%) \times .870$$

D = Weight of grain head and seeds used for moisture determination

E = Row Factor	28" = .001070
Area or percent of acre sampled with 20 feet row (2 rows x 10 feet)	30" = .001148
	36" = .001377
	38" = .001455
	40" = .001529

F = 56 lbs (weight of standard bushel of sorghum)

.870 = The standard moisture content conversion factor of sorghum per bushel (1.0 - .130)

After calculation of the gross yield, the statewide Harvest Loss will be subtracted from the gross yield to obtain a net yield per sample. Harvest Loss is the difference between actual grain yield and what is hauled from a field. The net yield determinations for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity.

MIXED HAY SAMPLING TECHNIQUE

- Step 1 - Mark the starting corner of the field to be sampled with a large stake and attach a ribbon or flag to it.
- Step 2 - Pace off predetermined sample point coordinates in a sequential fashion to determine individual sample locations.
- Step 3 - After taking the last of the required paces to the first sampling point, lay down a sampling frame perpendicular to the toe of your shoe, where applicable, crossing crop rows at a right angle. Mark the 2 ends of the sampling frame with the stakes

just inside the 3 feet sampling tines. Continue to lay out the sample area in the direction of travel from where the last pace was counted. Rotate the sampling frame so that it is perpendicular to one corner of the stake (previously marked) and at a right angle to the original frame position. Repeat this procedure to lay out the other 2 sides of the sampling square using the opposite corner of the original frame position to locate the other 2 sides. In all cases, the layout of the sample area shall be consistent for each randomly identified sample point.

Step 4 - Clip all hay stalks from within the square outlined by the sampling frame. The hay stalks should be uniformly clipped to an approximate height of 2 inches above ground level.

Step 5 - Quarter the collected sample and seal in a suitable poly bag sample container. Mark the sample container with the appropriate field number (as supplied by the mine operator), and sample identification number. Secure the sample container to prevent any sample loss. (Note: It is important when sampling hay that collected samples be chilled and transported in a container capable of sustaining the chilled condition. Hay deteriorates when allowed to heat up.)

Step 6 - Repeat steps 3 and 4 for each additional random sampling point coordinate.

Step 7 - Send or deliver to the Illinois Department of Agriculture any hay sample collected for moisture analysis. (Note: If any single sample requires more than one bag, additional bags should be identified sequentially such as 1A, 1B, 1C.)

* If a field moisture meter is used, steps 5 and 7 shall be eliminated and the following explanations for items A and D will be substituted.

A. Dry matter weight = harvest weight - percent moisture content determined by field moisture tests.

D. Percent moisture in hay at time of harvest determined by field moisture test.

The following method will be used for determination of gross yield of mixed hay samples. Gross yield is determined by deducting the adjustment for moisture content of the mixed hay sample from the harvest weight. Moisture content of mixed hay samples will be determined by lab analysis.

Gross Yield = Harvest weight adjusted for moisture content.

$$\text{Gross Yield Per Acre} = \frac{(A \times D)}{(C \times B \times E)}$$

(Tons/Acre)

Where:

A = Field weight or harvested weight of mixed hay in pounds

B = Plot size (sq. ft./43560 sq. ft/ac.) or number of acres

C = Conversion factor from lbs. to tons (i.e., 1 ton = 2000 pounds)

D = Dry matter content of harvested hay (100% - % moisture in hay)

E = Dry matter content of hay standard = 100% - 15%

The net yield determinations for each sample will be averaged together to obtain a yield figure for the entire field being evaluated for proof of productivity. The annual harvest will be determined by the cumulative yields of each cutting.

HAY SAMPLING BALED OR GREEN CHOPPED HAY

To be assured that sampling results are reliable, it is necessary to obtain accurate bale counts, accurate weights, and accurate moisture readings. Reading and following the instructions for the equipment that has been provided will for the most part insure correct interpretation of weights and moisture meter results. Acreage figures will be developed and verified by the Illinois Department of Agriculture. Verification of bale count is an area to be further elaborated on.

Depending on the use of the hay, an enumerator may be dealing with large round bales, small square bales or wagons of green chopped hay. In the case of large round bales, the enumerator need not be present during the baling of all of the product. If the operator provides a bale count for each field, the enumerator must provide a verification of the count. This can be done by physically visiting the field during baling and taking a bale count to compare with the count that will be provided by the operator. The verification of count can also be done by visiting the field and recording the counter number prior to baling, and then again reading the meter when each field is finished. It is not necessary to observe all of the baling. If an operator has multiple fields to pull weight samples from he may wish to do this on a single day to make his operation run in a more efficient manner. This is perfectly acceptable. The enumerator may identify sample bales just prior to weighing, and perform moisture and temperature tests at that time. Random verification of bale counts will discourage any impropriety on the part of the operator, and eliminate the need for constant observation.

This procedure will also work well for weighing and counting wagons of green chopped hay. The enumerator should perform random verification of truck weights and collect weight tickets for each field.

The operator should be reminded to provide the exact number of trucks coming from each field and the weight of each truck. Random verification of truck counts for individual fields is also encouraged. This will make a good comparison for the information received from the operator.

CORN

Size of Bond Release Field	Minimum Number of Samples
4 - 39 acres	8
40 - 279 acres	12
280 - 639 acres	16
640 acres or more	28

SOYBEANS

Size of Bond Release Field	Minimum Number of Samples
4 - 39 acres	10
40 - 279 acres	12
280 - 639 acres	16
640 acres or more	26

WHEAT

Size of Bond Release Field	Minimum Number of Samples
4 - 39 acres	6
40 - 279 acres	8
280 - 639 acres	10
640 acres or more	14

SORGHUM

Size of Bond Release Field	Minimum Number of Samples
4 - 39 acres	10
40 - 279 acres	16
280 - 639 acres	28
640 acres or more	40

MIXED HAY

Size of Bond Release Field	Minimum Number of Samples
4 - 39 acres	5
40 - 279 acres	10
280 - 639 acres	20
640 acres or more requires one (1) sample for each additional 35 acres	

SPECIAL PROBLEMS IN SAMPLE LAYOUT

1. It is possible for a sample grid coordinate to fall on areas within the field boundary which were not planted to crops (i.e., grass waterway, roadway, etc.) When this situation occurs, stop the pace count at the start of such an area and resume the count on the other side of the area.
2. If a blank area is crossed which was planted to crops, the pace count should be continued through this area. Usually such areas are due to poor germination, insects, standing water, etc. (if the sample area falls in this planted area which is blank, then a zero yield is established).
3. If a sample coordinate falls partly in a blank area which was not planted for harvest, move the sample area ahead until it is wholly on acreage planted to the crop being sampled. The sample point should begin one pace from the edge of the blank area.

(Source: Amended at 29 Ill. Reg. 10599, effective July 7, 2005)

Section 1816.EXHIBIT A County Crop Yields by Soil Mapping Unit

Column A	Column B	Column C	Column D*	Column E	Column F	Column G
Soil	County	% of total	Grain Acres	Adjusted	Optimum	Yield by
Mapping	Cropped	acres	by Soil	Optimum	Mgt.	(Bu/A)
Unit	Acreage	cropped	Mapping	Mgt.	Production	(T/A)
			Unit	Yield		

Total

Total

Total

Total

County Acres in

Corn _____

Soybeans _____

Wheat _____

Mixed Hay _____

*Total Acres _____

(Source: Amended at 29 Ill. Reg. 10599, effective July 7, 2005)