

# APPENDIX G

## STATUTORY REQUIREMENTS FOR DETERMINATION OF PROBABLE HYDROLOGIC CONSEQUENCES AND CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

A primary purpose of the Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. 1201 *et seq.* (SMCRA or the Act), is "to protect society and the environment from the adverse effects of surface coal mining." In particular, the Act stresses protection of the hydrologic balance. Sections 507, 508, 510, 515, 516, and 717 of the Act set forth the main hydrologic and geologic requirements for permitting, mining, and reclaiming a surface coal mining operation.

Two of the main elements in the permitting process are the determination of PHC and the CHIA. Hydrologic protection, in general, constitutes a major focus of the Title V program and applicable statutory references are excerpted below.

### Section 507 - Application Requirements

**507(b)** The permit application shall be submitted in a manner satisfactory to the regulatory authority and shall contain, among other things –

\* \* \* \* \*

**507(b)(11)** a determination of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site, with respect to the hydrologic regime, quantity and quality of water in surface and ground water systems including the dissolved and suspended solids under seasonal flow conditions and the collection of sufficient data for the mine site and surrounding areas so that an assessment can be made by the regulatory authority of the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area and particularly upon the water availability: Provided, however, that this determination shall not be required until such time as hydrologic information on the general area prior to mining is made available from an appropriate Federal or State agency: Provided further, that the permit shall not be approved until such information is available and is incorporated into the application.

**507(b)(14)** cross sections, maps or plans of land to be affected by an application for a surface mining and reclamation permit shall be prepared by or under the direction of a qualified registered professional engineer or geologist, or qualified registered professional land surveyor in any State which authorizes land surveyors to prepare and certify such maps or plans, with assistance from experts in related fields

such as land surveying and landscape architecture, showing pertinent elevation and location of test borings or core samplings and depicting the following information: the nature and depth of the various strata of overburden; the location of subsurface water, if encountered, and its quality; the nature and thickness of any coal or rider seam above the coal seam to be seam mined; the nature of the stratum immediately beneath the coal seam to be mined; all mineral crop lines and the strike and dip of the coal to be mined, within the area of land to be affected; existing or previous surface mining limits; the location and extent of known workings of any underground mines, including mine openings to the surface; the location of aquifers; the estimated elevation of the water table; the location of spoil, waste, or refuse areas and topsoil preservation areas; the location of all impoundments for waste or erosion control; any settling or water treatment facility; constructed or natural drain ways and the location of any discharges to any surface body of water on the area of land to be affected or adjacent thereto; and profiles at appropriate cross sections of the anticipated final surface configuration that will be achieved pursuant to the operator's proposed reclamation plan (as amended November 4, 1983).

**507(b)(15)** a statement of the result of test borings or core samplings from the permit area, including logs of the drill holes; the thickness of the coal seam found, an analysis of the chemical properties of such coal; the sulfur content of any coal seam; chemical analysis of potentially acid or toxic forming sections of the overburden; and chemical analysis of the stratum lying immediately underneath the coal to be mined except that the provisions of this paragraph (15) may be waived by the regulatory authority with respect to the specific application by a written determination that such requirements are unnecessary.

## **Section 508 - Reclamation Plan Requirements**

**508(a)** Each reclamation plan submitted as part of a permit application \* \* \* shall include, in the degree of detail necessary to demonstrate that reclamation required by the State or Federal program can be accomplished, a statement of:

\* \* \* \* \*

**508(a)(5)** the engineering techniques proposed to be used in mining and reclamation and a description of the major equipment; a plan for the control of surface-water drainage and of water accumulation; a plan, where appropriate, for backfilling, soil stabilization, and compacting, grading, and appropriate re-vegetation; a plan for soil reconstruction, replacement, and stabilization, pursuant to the performance standards in section 515(b)(7)(A), (B), (C), and (D), for those food, forage, and forest lands identified in sections 515(b)(7); an estimate of the cost per acre of the reclamation, including a statement as to how the permittee plans to comply with each of the requirements set out in section 515.

**508(a)(9)** the steps to be taken to comply with applicable air and water quality laws and regulations and any applicable health and safety standards.

**508(a)(12)** the results of test boring which the applicant has made at the area to be covered by the permit, or other equivalent information and data in a form satisfactory to the regulatory authority,

including the location of subsurface water, and an analysis of the chemical properties including acid-forming properties of the mineral and overburden: Provided, that information which pertains only to the analysis of the chemical and physical properties of the coal (excepting information regarding such mineral or elemental contents which is potentially toxic in the environment) shall be kept confidential and not made a matter of public record.

**508(a)(13)** a detailed description of the measures to be taken during the mining and reclamation process to assure the protection of:

- (A) The quality of surface and ground water systems, both on- and off-site, from adverse effects of the mining and reclamation process.
- (B) The rights of present users to such water.
- (C) The quantity of surface- and ground-water systems, both on- and off-site, from adverse effects of the mining and reclamation process or to provide alternative sources of water where such protection of quantity cannot be assured.

## **Section 509 - Performance Bonds**

**509(a)** After a surface coal mining and reclamation permit application has been approved but before such a permit is issued, the applicant shall file with the regulatory authority, on a form prescribed and furnished by the regulatory authority, a bond for performance payable, as appropriate, to the U.S. or to the State, and conditional upon faithful performance of all the requirements of this Act and permit. The bond shall cover that area of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations within the initial term of the permit. As succeeding increments of surface coal mining and reclamation operations are to be initiated and conducted within the permit area, the permittee shall file with the regulatory authority an additional bond or bonds to cover such increments in accordance with this section. The amount of the bond required for each bonded area shall depend upon the reclamation requirements of the approved permit; shall reflect the probable difficulty of reclamation giving consideration to such factors as topography, geology of the site, hydrology, and re-vegetation potential, and shall be determined by the regulatory authority. The amount of the bond shall be sufficient to assure the completion of the reclamation plan if the work had to be performed by the regulatory authority in the event of forfeiture and in no case shall the bond for the entire area under one permit be less than \$10,000.

## **Section 510 - Permit Approval or Denial**

**510(b)** No permit or revision application shall be approved unless the application affirmatively demonstrates and the regulatory authority finds in writing on the basis of the information set forth in the application or from information otherwise available which will be documented in the approval, and made available to the applicant, that –

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**510(b)(3)** the assessment of the probable cumulative impact of all anticipated mining in the area on the hydrologic balance specified in section 507(b) has been made by the regulatory authority and the proposed operation thereof has been designed to prevent material damage to hydrologic balance outside permit area.

**510(b)(5)** the proposed surface coal mining operation, if located west of the one hundredth meridian west longitude, would -

(A) not interrupt, discontinue, or preclude farming on alluvial valley floors that are irrigated or naturally subirrigated, but, excluding undeveloped range lands which are not significant to farming on said alluvial valley floors and those lands as to which the regulatory authority finds that if the farming that will be interrupted, discontinued, or precluded is of such small acreage as to be of negligible impact on the farm's agricultural production, or

(B) not materially damage the quantity or quality of water in surface or underground water systems that supply these valley floors in (A) of subsection (b)(5).

## **Section 515 - Environmental Protection Performance Standards**

**515(b)** General performance standards shall be applicable to all surface coal mining and reclamation operations and shall require the operation as a minimum to -

\* \* \* \* \*

**515(b)(4)** stabilize and protect all surface areas including spoil piles affected by the surface coal mining and reclamation operation to effectively control erosion and attendant air and water pollution.

**515(b)(8)** create, if authorized in the approved mining and reclamation plan and permit, permanent impoundments of water on mining sites as part of reclamation activities only when it is adequately demonstrated that--

- (A) The size of the impoundment is adequate for its intended purposes.
- (B) The impoundment dam construction will be so designed as to achieve necessary stability with an adequate margin of safety compatible with that of structures constructed under Public Law 83-566 (16 U.S.C. 1006).
- (C) The quality of impounded water will be suitable on a permanent basis for its intended use and that discharges from the impoundment will not degrade the water quality below water quality standards established pursuant to applicable Federal and State law in the receiving stream.
- (D) The level of water will be reasonably stable.
- (E) Final grading will provide adequate safety and access for proposed water users.

- (F) Such water impoundments will not result in the diminution of the quality or quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.

**515(b)(9)** conduct any augering operation associated with surface mining in a manner to maximize recoverability of mineral reserves remaining after the operation and reclamation are complete; and seal all auger holes with an impervious and noncombustible material in order to prevent drainage except where the regulatory authority determines that the resulting impoundment of water in such auger holes may create a hazard to the environment or the public health or safety: Provided, that the permitting authority may prohibit augering if necessary to maximize the utilization, recoverability or conservation of the solid fuel resources or to protect against adverse water quality impacts;

**515(b)(10)** minimize the disturbances to the prevailing hydrologic balance at the mine site and in associated off-site areas and to the quality and quantity of water in surface and ground water systems both during and after surface coal mining operations and during reclamation by- -

- (A) Avoiding acid or other toxic mine drainage by such measures as, but not limited to- -
- (i) Preventing or removing water from contact with toxic producing deposits.
  - (ii) Treating drainage to reduce toxic content which adversely affects downstream water upon being released to water courses.
  - (iii) Casing, sealing, or otherwise managing boreholes, shafts, and wells and keeping acid or other toxic drainage from entering ground and surface waters.
- (B)(I) Conducting surface coal mining operations so as to prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow, or runoff outside the permit area, but in no event shall contributions be in excess of requirements set by applicable State or Federal law;
- (ii) Constructing any siltation structures pursuant to subparagraph (B) (I) of this subsection prior to commencement of surface coal mining operations, such structures to be certified by a qualified registered engineer to be constructed as designed and as approved in the reclamation plan.
- (C) Cleaning out and removing temporary or large settling ponds or other siltation structures from drain ways after disturbed areas are re-vegetated and stabilized; and depositing the silt and debris at a site and in a manner approved by the regulatory authority.
- (D) Restoring recharge capacity of the mined area to approximate premining conditions.
- (E) Avoiding channel deepening or enlargement in operations requiring the discharge of water from mines.

- (F) Preserving throughout the mining and reclamation process the essential hydrologic functions of alluvial valley floors in the arid and semiarid areas of the country.
- (G) Such other actions as the regulatory authority may prescribe.

**515(b)(17)** insure that the construction, maintenance, and postmining conditions of access roads into and across the site of operators will control or prevent erosion and siltation, pollution of water, damage of fish or wildlife or their habitat, or public or private property.

**515(b)(18)** refrain from the construction of roads or other access ways up a stream bed or drainage channel or in such proximity to such channel so as to seriously alter the normal flow of water.

**515(b)(24)** to the extent possible using the best technology currently available, minimize disturbances and adverse impacts of the operation of fish, wildlife, and related environmental values, and achieve enhancement of such resources where practicable.

## **Section 516 - Surface Effects of Underground Coal Mining Operations**

**516(b)** Each permit issued under any approved State or Federal program pursuant to this Act and relating to underground coal mining shall require the operator to –

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**516(b)(4)** with respect to surface disposal of mine wastes, tailings, coal processing wastes, and other wastes in areas other than the mine workings or excavations, stabilize all waste piles created by the permittee from current operations through construction in compacted layers including the use of incombustible and impervious materials if necessary and assure that the leachate will not degrade below water quality standards established pursuant to applicable Federal and State law surface or ground-waters and that the final contour of the waste accumulation will be compatible with natural surroundings and that the site is stabilized and re-vegetated according to the provisions of this section.

**516(b)(9)** minimize the disturbances of the prevailing hydrologic balance at the minesite and in associated off-site areas and to the quantity of water in surface ground-water systems both during and after coal mining operations and during reclamation by –

- (A) Avoiding acid or other toxic mine drainage by such measures as, but not limited to–
  - (i) Preventing or removing water from contact with toxic producing deposits.
  - (ii) Treating drainage to reduce toxic content which adversely affects downstream water upon being released to water courses.
  - (iii) Casing, sealing, or otherwise managing boreholes, shafts, and wells to keep acid or other toxic drainage from entering ground and surface waters.

- (B) Conducting surface coal mining operations so as to prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow or runoff outside the permit area (but in no event shall such contributions be in excess of requirements set by applicable State or Federal law), and avoiding channel deepening or enlargement in operations requiring the discharge of water from mines.

**516(b)(12)** locate openings for all new drift mines working acid producing or iron producing coal seams in such a manner as to prevent a gravity discharge of water from the mine.

## **Section 517 - Inspections and Monitoring**

**517(b)** For the purpose of developing or assisting in the development, administration, and enforcement of any approved State or Federal program under this Act or in the administration and enforcement of any permit under this Act, or of determining whether any person is in violation of any requirement of any such State or Federal program or any other requirement of this Act –

\* \* \* \* \*

**517(b)(2)** for those surface coal mining and reclamation operations which remove or disturb strata that serve as aquifers which significantly insure the hydrologic balance of water use either on or off the mining site, the regulatory authority shall specify those –

- (A) monitoring sites to record the quantity and quality of surface drainage above and below the minesite as well as in the potential zone of influence.
- (B) monitoring sites to record level, amount, and samples of ground water and aquifers potentially affected by the mining and also directly below the lowermost (deepest) coal seam to be mined.
- (C) records of well logs and borehole data to be maintained.
- (D) monitoring sites to record precipitation.

The monitoring data collection and analysis required by this section shall be conducted according to standards and procedures set forth by the regulatory authority in order to assure their reliability and validity.

## **Section 519 - Release of Performance Bonds**

**519(c)** The regulatory authority may release in whole or in part said bond or deposit if the authority is satisfied the reclamation covered by the bond or deposit or portion thereof has been accomplished as required by this Act according to the following schedule:

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**519(c)(2)** after re-vegetation has been established on the regraded mined lands in accordance with the approved reclamation plan. When determining the amount of bond to be released after successful re-vegetation has been established, the regulatory authority shall retain that amount of bond for the re-vegetated area which would be sufficient for a third party to cover the cost of reestablishing re-vegetation and for the period specified for operator responsibility in section 515 of reestablishing re-vegetation. No part of the bond or deposit shall be released under this paragraph so long as the lands to which the release would be applicable are contributing suspended solids to streamflow or runoff outside the permit area in excess of the requirements set by section 515(b)(10) or until soil productivity for prime farm lands has returned to equivalent levels of yield as un-mined land of the same soil type in the surrounding area under equivalent management practices as determined from the soil survey performed pursuant to section 507(b)(16). Where a silt dam is to be retained as a permanent impoundment pursuant to section 515(b)(8), the portion of bond may be released under this paragraph so long as provisions for sound future maintenance by the operator or the landowner have been made with the regulatory authority.

## **Section 717 - Water Rights and Replacement**

**717(b)** The operator of a surface coal mine shall replace the water supply of an owner of interest in real property who obtains all or part of his supply of water for domestic, agricultural, industrial, or other legitimate use from an underground or surface source where such supply has been affected by contamination, diminution, or interruption proximately resulting from such surface coal mine operation.

## **Section 720 - Subsidence**

**720(a)** Underground coal mining operations conducted after the date of enactment of this section shall comply with each of the following requirements:

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**720(a)(2)** promptly replace any drinking, domestic, or residential water supply from a well or spring in existence prior to the application for a surface coal mining and reclamation permit, which has been affected by contamination, diminution, or interruption resulting from underground coal mining operations.