

Unconsolidated Mineral Large Noncoal Mining Operations Calculation of Bond Amounts

Unconsolidated Minerals

The term unconsolidated mineral is used to describe rock that is loosely arranged or unstratified sediment in which particles are not cemented together, commonly called sand and gravel. Mine operations in Pennsylvania use a variety of mining techniques, and the reclamation plans consider the post-mining land use, quantity of minerals mined, and volume of soils available for reclamation.

General Methodology

The rules and regulations that govern noncoal mining operations require the mine operator to post a bond to ensure the reclamation of the mine site. The Department of Environmental Protection (DEP) is required to establish a bond rate schedule (BRS) based on the estimated cost to DEP to complete the reclamation requirements of the permit. DEP developed the BRS using actual bid costs submitted for abandoned mine lands and forfeited mine site reclamation contracts and other appropriate sources.

The bond amount is based on the mine operator's description of the maximum amount of reclamation required during the term of the permit and the BRS. The BRS is published in the *Pennsylvania Bulletin* and can be found at the Bureau of Mining Programs website at: www.dep.pa.gov/Business/Land/Mining/BureauofMiningPrograms/Bonding/Pages/default.aspx.

Two types of mining permits – large noncoal and small noncoal mining permits – are available to mine operators. Large noncoal mining permits have no regulatory limit on the quantity of minerals to be mined. The limits are established in the mining permit based on the mining and reclamation plan. This fact sheet discusses bonding on large noncoal mining permits. For information about bonding of small noncoal permits, please see the fact sheet entitled “Small Noncoal Mining Operations Calculation of Bond Amounts.”

Bond Calculation – Large Noncoal Mining Permits

The basic approach to bonding large noncoal mine sites is to apply a flat per-acre rate to cover minor grading and revegetation and supplement that with the bond to account for reclaiming the highwall, demolition, or other site-specific costs.

The BRS includes a per-acre rate for areas that are or will be disturbed for mining. This rate is for the cost of minor grading and revegetation. The per-acre rate for the support area is for the cost of revegetation. The additional bond to cover the cost to achieve the post-mining land use for activities such as backfilling, selective grading of the highwall, demolition, and other site-specific features are also considered in determining the bond required for the mine site.

DEP will calculate the bond liability based on the maximum portion of the permitted area that the operator is authorized to disturb at any specific time. This area is described in the operator's mining and reclamation plans and must include all of the land affected by mining activities that is not planted, growing, and stabilized.

The post-mining reclamation plan can be accomplished using a variety of techniques depending on the volume of mineral to be mined and the availability of soil above the mineral to be mined, called overburden, that can be used to achieve the post-mining reclamation contours.

Generally, the volume of unconsolidated material being mined is significantly greater than the overburden, making it unlikely to achieve the approximate original contour during reclamation. An alternative reclamation contour is approved for these types of sites. One method of achieving the post-mining contour is to grade the highwall to the reclamation slopes. The bond is calculated using the

acreage of highwall to be graded to achieve the post-mining contours. The horizontal width of the reclamation slope is multiplied by the length of the highwall to determine the area of highwall to be reclaimed. The amount of the bond is calculated by multiplying the acreage of highwall by the per-acre bond rate for the maximum height of the highwall.

Some sites mine the unconsolidated materials below the water table and the post-mining land use is a water impoundment. Initially, while the mining is above the projected post-mining water level, the bond is calculated using the per-acre rate for mining the entire mining area. The reclamation plans should include a safety bench surrounding the water impoundment to allow for safe exit from the impoundment. Once the mining has advanced below the post-mining water level, the reclamation bond should be calculated to include the safety bench around the perimeter of the impoundment. If the safety bench will be achieved using selective grading, the amount of the bond is calculated using the length of the maximum area requiring a safety bench and the width of the safety bench. The acreage is multiplied by the per-acre bond rate in the BRS for water impoundments. The area below the safety bench is no longer required to be included in the per-acre mining rate calculations, and the bonds can be adjusted accordingly.

Another method is to use the overburden to backfill along the highwall to achieve the reclamation slopes. The volume of overburden required to achieve the reclamation slopes is calculated based on the mining and reclamation plans. This volume is multiplied by the cost per cubic yard of overburden contained in the BRS.

Erosion and sedimentation control ponds and treatment ponds are bonded using a flat rate for each pond that will be removed when mining is complete. This rate includes dewatering the pond, grading, topsoil replacement, and revegetation.

Available cost information will be used in the event that a feature on a mine site is not listed in the BRS and the cost is necessary to calculate the reclamation bond. If enough data is not available, the rate will be set from *Means Building Construction Cost Data* or *Walker's Building Estimator's Reference Book*. Structure demolition costs may be included for structures that are not compatible with the post-mining land use. Structures that have reasonable post-mining uses do not require bonding.

A mine operator who intends to delay activation of a mine site for an extended period of time can request the bond be adjusted down to the minimum bond established in the regulations. The mining permit can be issued by posting the minimum bond. No mining activities can occur within the permit area until the full amount of the bond is posted.

For more information, visit www.dep.pa.gov.