**Kentucky**
**Department for Surface Mining**
**Reclamation and Enforcement**

# Reclamation
# Advisory
# Memorandum

From: Dave Rosenbaum, Commissioner

Date: May 3, 1994

Subject: Water Blowouts at Underground Mines --
Outcrop Barrier Pillars

# RAM # 114

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This spring there have been several mine "blowouts" in eastern Kentucky. These occur when there is a significant buildup of water and pressure against the outcrop barrier pillar of unmined coal (or in some cases, against a constructed mine seal), and the outcrop barrier suddenly gives way, allowing the rapid discharge of a large volume of impounded water to the surface. These large discharges are highly erosive and can be especially destructive in the steep terrain of eastern Kentucky. They can cause extensive environmental and property damage, and can even threaten the physical safety of people nearby. After a blowout a mine may be a long-term source of acid mine drainage.

Most blowouts result from simply mining too close to the outcrop, leaving an outcrop barrier pillar that is too narrow and weak to resist the eventual buildup of water pressure or too weak to support the overburden. Thus, most blowouts are preventable if reasonable care is taken to leave an adequate outcrop barrier.

There are several site-specific factors that may interact in complex ways to determine the actual structural adequacy of a particular outcrop barrier. However, most decisions about the size of outcrop barrier pillars are made using empirical methods (methods that are arrived at from practical experience as to what has worked well in the field, rather than from purely scientific or theoretical considerations). One of the most common, and apparently one of the most reliable of these methods is a formula called "the rule of thumb," which states that the width of the outcrop barrier pillar should be at least 50 feet plus the maximum hydrostatic head that can build up on the outcrop barrier: $W = 50 + H$.

For example, if water could be impounded in the mine to an elevation that is 25 feet above the base of the outcrop barrier, the barrier should be at least $(50 + 25) = 75$ feet wide. If water could be impounded in the mine to an elevation 150 feet above the base of the outcrop barrier, the barrier should be at least $(50 + 150) = 200$ feet wide.

This formula is very simple, and yet is apparently very effective, so that DSMRE strongly recommends its use. Also, by this RAM DSMRE is providing advance notice that it plans to promulgate an administrative regulation to require that outcrop barrier pillars be at least as wide as given by this formula.

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