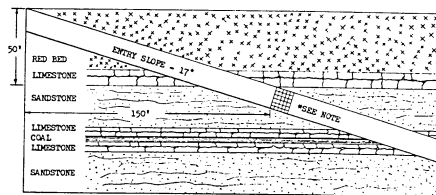


CHEMICAL GROUTING TO PREVENT INFLOW OF WATER



*NOTE: HATCHED AREA SHOWS WHERE EXCESSIVE WATER SEEPAGE OCCURRED.
SEE FRONT VIEW DIAGRAM FOR DETAILS ON CHEMICAL GROUTING.

Figure 1. Side View-Entry Slope

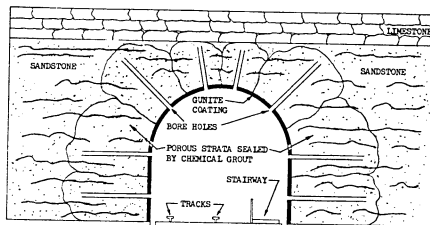


Figure 2. Front View-150 Feet Down Entry Slope
(Vertical Depth - 50 Feet)

MINING METHOD: Underground mining.

LOCATION: Western Pennsylvania, Upper Freeport Seam.

RESULTS ACHIEVED: Inflow of water into mine stopped. This in turn eliminated severe icing conditions on the walls and ceiling of the mine slope near the entry. This resulted in improved safety conditions and in substantial savings in time and material. The method would be useful to control mine drainage.

DESCRIPTION: Water leakage occurred along the plane of intersection of the mine entry with water-bearing strata. Holes were drilled in the roof and ribs of the entry. First, water containing Calcoacid Uranine dye, a fluorescent yellow-green color, was pumped into these holes to locate the leakage; then chemical grout was pumped into the holes to seal off the water.

(over)