

# Mine Grouting Expertise

## Troubleshooting

**MULTIURETHANES** troubleshoots difficult mine grouting projects for mining companies and mining contractors. We are called when mining activities have been stopped due to water inflows beyond the experience of site personnel. It is usually possible to solve water inflow problems and resume mining operations within a few days.

## Technical Support

Site specific details are evaluated to provide owners with a sound technical basis for planning and undertaking mine grouting projects. **MULTIURETHANES** combines mine grouting experience with a sound technical methodology for analyzing grouting requirements. Alternate solutions are proposed to facilitate selection of the most appropriate grouting methods for specific conditions.

## Training

Project personnel are instructed in the fundamentals of grouting operations and are trained in the proper selection and use of grouting materials and equipment. Mine grouting projects are usually unique in one way or another, which requires specific training for site conditions. Monitoring and evaluating quality control of grouting materials is an important aspect of our training activities.



*Miners preparing for polyurethane injection to stop inflows of quicksand into a 24 foot diameter shaft collar excavation*

## Technology

Our grouting knowledge is based on years of practical hands-on mine grouting experience, up-to-date review of grouting textbooks and technical papers, and access to specialized grouting equipment and materials from around the world. From basic grouting operations with conventional cements, up to the advanced use of special grout additives and admixtures, **MULTIURETHANES** specializes in the transfer of the specific grouting technologies as required to overcome site conditions.

## Techniques

The use of appropriate grouting techniques is the real secret to our success on most grouting projects, including water pressure testing, multiple hole grouting, use of stable grout mixes, balanced grout formulations, combined use of cement grout with polyurethane or sodium silicate to achieve fast setting grouts. We use materials, equipment and techniques to deliver low pressure grouting solutions for most mine grouting projects - it's how you do it, not how much pressure you use.

## Products

Where possible, we work with conventional Portland cements and other grouting materials purchased from local suppliers near the job site. Where required, we supply microfine cement and special additives for cement grouting operations. Water-activated polyurethane resin is available from our inventory for stopping water inflows which are not appropriate for the use of cement grouts.

## Equipment

A wide assortment of cement and polyurethane grouting equipment is available for sale or rental, depending on the scope of grouting work involved. Grout mixers and pumps are available with compressed air or electric power as required. Specialized equipment for quality control monitoring of cement grouts is available from our inventory.

WATER CUT-OFF ● SEWER REHABILITATION ● CONCRETE RESTORATION ● CRACK INJECTION ● WATERPROOFING

## TYPICAL GROUTING PROJECTS

### TVX GOLD INC.

Gardiner, Montana

\* modified existing equipment for grouting water inflows into mine access tunnel; trained crews in mine grouting procedures

### THOMASVILLE STONE AND LIME

Thomasville, PA

\* recommended grouting materials and procedures for controlling 500 GPM inflow into underground limestone mine

### UNITED PARAGON MINING CORP.

Philippines

\* developed detailed grouting program, bills of materials and equipment required for stopping 800 GPM inflow from fault zone prior to resumption of shaft sinking operations  
 \* supervised and trained local manpower to stop 800 GPM shaft bottom water inflow using cement grouts accelerated with sodium silicate

### SUDBURY CONTACT MINES

Kirkland Lake, Ontario

\* designed and supervised pre-grouting of shaft excavation in fractured rock to a depth of 600 feet using ordinary and microfine cements

### S. McNALLY & SONS LTD.

Toronto, Ontario

\* supervised a cement and polyurethane grouting program undertaken by contractor's personnel which consolidated unstable water-bearing soils at two shaft locations

### AGNICO-EAGLE MINES LIMITED

Cadillac, Quebec

\* supervised a cement grouting program with sodium silicate to stop water inflows into a ventilation raise at a depth of 300 feet

### AUR RESOURCES INC.

Val D'Or, Quebec

\* supervised sealing of drill holes with flow rates of 500 gpm and pressure of 400 psi using cement grout and thixotropic modifiers  
 \* directed polyurethane grouting operation to seal access drift against water infiltration

### H.F. DARLING, INC.

Niagara Falls, NY

\* supervised pre-grouting of overburden and rock prior to shaft excavation

### HEMLO GOLD INC.

Matheson, Ontario

\* supervised grouting operations to overcome quicksand conditions during sinking of 24 foot diameter caisson through 60 feet of plastic clays and water-bearing sand formations

### CP RAIL

Rogers Pass, British Columbia

\* prepared technical recommendations and cost estimates for reducing water infiltration into concrete lined ventilation shaft  
 \* trained railway personnel and directed successful implementation of polyurethane grouting operation to stop water infiltration

### TALPA DYNATEC

Val D'Or, Quebec

\* supervised the successful grouting of a water-bearing fault zone beneath a shaft sinking operation at a depth of 2200 feet below surface; existing water pressures of 800 psi were controlled using a combination of microfine cement and multiple hole grouting techniques

### BARRICK GOLD CORPORATION

Matheson, Ontario

\* supervised water pressure testing and grouting operations to reduce water infiltration into existing backfill raise using a combination of cement grouting and polyurethane injection through drill holes 300 feet long  
 \* designed polyurethane and cement grouting programs used to stop water infiltration into a new backfill raise at depths to 500 feet; provided grouting equipment, materials and training for contractor personnel



*Water-activated polyurethane foam used to stop water inflows through leaking concrete construction joints in underground mine shaft lining using UNIVERSAL resin*

**FOR MORE INFORMATION, VISIT OUR WEBSITE AT [www.multiurethanes.com](http://www.multiurethanes.com)**

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