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Your Water, Wastewater, & Materials Dewatering Partner
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Coal Mine Pilot Study

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Objective

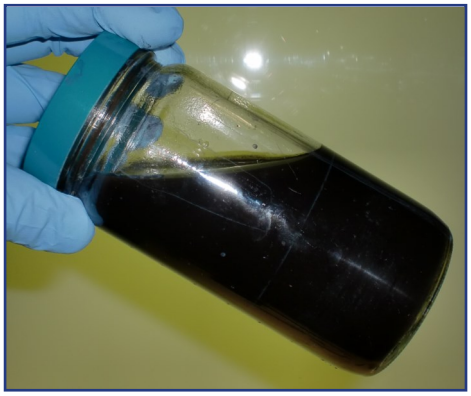
WaterSolve LLC, was tasked to provide technical assistance for the installation of a Geotube® container dewatering system at a large coal mine in western Colorado. The primary objective of the Geotube® dewatering was to allow the entire plant to operate at full capacity. Currently, some of the solids thickening/dewatering processes within the plant do not allow for the plant to operate at the desired capacity. Sending a portion of the flow to the Geotube® containers should allow the equipment to operate at these desired levels.

Geotube® Container Dewatering Technology

Geotube® containers are manufactured from high strength polypropylene fabric and designed to allow effluent water to escape through the pores of the fabric while retaining the chemically-conditioned solids. Three-22.5 ft. circumference by 22-ft. long Geotube® MDS containers, polymer feed systems, and appurtenant piping and fittings were installed to dewater coal processing residual from the "Prep Plant" at the mine.

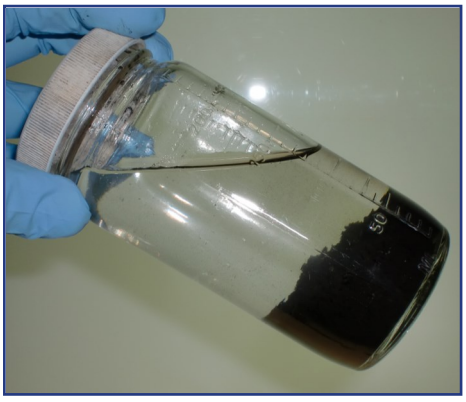
WaterSolve's Chemical Conditioning

A representative sample of the mine water was tested by a WaterSolve technician in the facilities laboratory. Dewatering polymers were evaluated based on water release rate, water clarity, and flocculent appearance. In addition, dosing rate(s) were determined during bench-top dewatering experiments and recommendations provided to the facility during this phase of the program. The polymer make-down and pumping was accomplished using the equipment at the facility. Dewatering polymer used for this installation was based on the "Dewatering Performance Trial" completed by WaterSolve, LLC on November 24, 2010 and the current operation of the facility. On-site Geotube® Dewatering Tests (GDTs) were completed at the "Prep Plant" on December 2, 2010.



On left, thicker feed prior to chemical conditioning.

On right, thicker feed with recommended flocculent.



The Result

Two separate residuals were dewatered during this initial installation. The thickener feed is approximately 2-3% solids and is the influent to the existing thickener. A dry coagulant is added upstream of the thickener and the samples previously tested were after this dry coagulant addition. This residual was further conditioned with flocculent and pumped to the Geotube® container. The thickener underflow is approximately 15-20% solids and was pumped directly to the Geotube® container without further conditioning (the flocculent is added in the thickener).

The Geotube® containers were placed individually in the dump bed of a large truck. The bed of the truck had the tailgate open and had grating installed to facilitate drainage. The filtrate was directed toward an existing sump area and was then pumped back into the plant.

Significant snowfall was present at the mine area during the trial. The Geotube® container in the truck bed in the morning after pumping thickener feed all night. The filtrate is diverted into the sump area to the right and then pumped back into the plant.

The first Geotube® container is dumped at the disposal site (left).

The clear filtrate is shown in the photograph (right.).

The Geotube® container shown from above (left).

Plywood was added to keep the corners of the container from the potential pinch point of the tailgate support (right).