Sealing Boreholes
Redland Indianola Mine Pool Project
Indianola, Pennsylvania

Owner/Client: Department of Environmental Protection
Clean Streams Foundation

Engineer: Department of Environmental Protection

Project Features:

- Construction of a permanent access road
- Implementation of an erosion and sediment control plan
- Drilling 2 boreholes to accommodate 8" stainless steel casing into an abandoned deep mine water pool in the Upper Freeport Coal Seam
- Construction of drainage ditches with rock lining and filter material
- Sealing 2 existing boreholes which were each discharging mine water at rates over 1000 gallons per minute
- Restoring and seeding of all disturbed areas

Background:

Two boreholes left open in the 1970's became natural outlets for water which collected in an abandoned mine pool. Over time, a steady flow of water caused these borehole openings to widen significantly and large amounts of water to continuously discharge. Armstrong Drilling Inc. was contracted by the Clean Streams Foundation under the direction of the Department of Environmental Protection to essentially divert this flow of mine water being discharged under artesian conditions.

Description of Work:

A permanent access road, approximately 1000' long and 12' wide and made of brick rubble, was installed in order to allow equipment access to the new boring locations. Trees and brush were cleared and an Acker Mini Max drill rig was brought in which drilled two 3" test borings into the mine pool, reaching 150' below ground surface.

Once a flow of water was established to ensure an outlet for the mine water, an inflatable packer was set in the hole to seal the flow. Over 170' of permanent ditches were then constructed, nearly 15' wide using rock lining and filter material, to control the flow of water and divert it into a nearby stream.

Armstrong Drilling then drilled over top of these boreholes using a 14" bit and set 12" PVC casing into the rock layer, roughly 30' deep. Once this casing was grouted in place, a 12" drill bit was used to drill into the mine pool so that 8" stainless steel casing

could be grouted in place, once again with the help of an inflatable packer to block the steady flow of mine water.

Valves were then constructed on the 12” PVC to control the flow of water and testing to be done. After the valves were in place the inflatable packers were removed from the holes and the mine water flowed freely into the drainage ditches which led to a nearby stream. Once an alternate route of escape was established for the mine pool water, Armstrong Drilling still had the difficult task of stopping the 1000 gallon a minute flow coming out of the previously existing boreholes. Inflatable packers were set into these holes which allowed them to be grouted and sealed. Once sealed, surface conditions were restored using gravel, topsoil and seeding.

Project Challenges:

With flow rates of over 1000 gallons per minute, decreasing the water flow enough to be able to set PVC and steel casing was extremely difficult. Armstrong Drilling worked closely with the Clean Streams Foundation’s limited budget and consulted withmultiple DEPengineers in order to successfully complete this project.

Start Date: February 2013
Completion: June 2013

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