



DEWATERING RESIDUALS AT A COAL FIRED POWER PLANT

Objective

Facility managers at this coal fired electric power plant needed to remove the residuals from a settling pond and dewater them for subsequent hauling to a landfill. The landfill was about to be closed and the material needed to be removed quickly to meet the closing deadline. A sample of the pond sediment was sent to WaterSolve's lab in March of 2010 to evaluate the potential for success using Geotube® dewatering technology. Tests revealed this would be an excellent application for dewatering with Geotube® containers. Based on the testing, estimates were generated for dredging pond residuals and pumping to Geotube® containers for dewatering.

Geotube® Container Sizing

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. The facility managers estimated there were 14,150 CY of the 40% dry wt solids in the pond to be removed. The footprint for the Geotube® lay-down area was limited. The Geotube® container estimating program determined that two 100' circumference by 243' long tubes would be filled, in pad A, followed by one 80' circumference by 272' long tube in pad B. We would then return to pad A and stack a 105' circumference by 214' long tube on top of the two tubes on that pad. These 4 tubes would have sufficient room to contain the solids estimated for the project.

WaterSolve's Chemical Conditioning

A representative sample of the pond sediment was sent to WaterSolve's lab. 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. Solve 216B was the recommended polymer for dewatering this residual in the Geotube® containers. After identifying the polymer a Rapid Dewatering Trial (RDT) was performed to measure the raw dry wt solids of the pond sediment, the volume of filtrate, and the percent dry wt solids of the cake collected by a GT500D Geotube® filter. These tests revealed the raw dry wt solids of the sediment were 40%. They would need to be diluted to 15% during dredging operations to achieve good interstitial space for the polymer to interact with the solids. One hour after pouring the 150-mL treated sample into the filter 75-mL of filtrate was collected. These tests revealed excellent results and the data collected was used to comprise the estimates for the dewatering operation.



These samples from left to right represent the raw sediment being dredged, chemically treated with polymer, and filtrate water coming out of the Geotube® container.

The Result

WaterSolve LLC was contracted by the dredging contractor to dewater the pond sediment using Geotube® dewatering technology. WaterSolve supplied the Geotube® containers, emulsion polymer, polymer feed system, and technical training to operate the system. A WaterSolve technician arrived on site as the 8” pipeline was being installed from the dredge in the sediment pond to the two dewatering containment pads. He directed the workers on where to install the chemical feed system and sample ports used to determine the proper dose of polymer. A polymer make-

down unit was plumbed to the 8” mixing manifold to provide good contact of the polymer with the pond residual in the pipeline en route to the Geotube® containers. An electric pump drew water from the sediment pond and supplied the make-down unit with dilution water for the polymer. The technician further directed the workers on unrolling the Geotube® containers in both pads. Six inch hoses coming off the 8” feed-line were connected to the fill-ports and the pumping began. The technician continued to instruct the site personal on the polymer dosing and operations of the Geotube® containers.



This hydraulic dredge pumped 1700-GPM of the sediment pond residual to the Geotube® containers.



A polymer make-down unit is plumbed to the mixing manifold in the 8” supply line on its way to the Geotube® containers delivering 12 gallons of Solve 216B emulsion polymer per hour.



The Geotube containers were placed on a prepared pad of crushed stone. They are shown above in operation releasing clear filtrate.



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