



Dewatering City's Pipeline Flush Residuals

Volume 303

April, 2009

Objective

Facility managers at this water treatment plant in Indiana, were experiencing reduced flow rates from the well fields 3 miles from the plant. They discovered the 12" pipeline transferring the water had accumulated residuals on its walls over time causing the restriction in flow. Efforts needed to be made to remove the residuals and regain the capacity. They decided to flush the pipeline and force foam pigs through it to swab the residuals out of the pipe, but the water plant could not handle the heavy concentration of the residuals from the flush. The facility managers searched for alternatives to process the water and capture the residuals. The city's wastewater treatment superintendent recommended using a Geotube® dewatering container to filter the water and capture the residuals. The objective was to isolate the well fields from the water plant and flush the pipeline with foam pigs for four hours and then continue flushing another 4 hours until the water cleared up. Meanwhile the city ran on water reserves. When the water had cleared up the valves were opened and the plant returned to normal operation. WaterSolve LLC was contracted to study if the flush water could be processed in a Geo-

tube® container in order to capture and dewater the residuals.

WaterSolve's Chemical Conditioning

A representative sample of the pipeline residuals was collected and sent to WaterSolve's laboratory where it was diluted 2/1 (water/raw residuals) for testing. 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 project. WaterSolve's flocculent Solve 9310 was recommended to dewater this residual in a Geotube® container. A 150-mL sample of the diluted residuals where chemically treated with 133-ppm of Solve 9310 and poured through a Geotube® filter during a RDT (Rapid Dewatering Test). 90-mL of filtrate was collected in 60 minutes and the dry weight solids elevated from 6.9% in the sample to 16.6% in the cake collected by the filter during the same time period. Based on the success of these results a pilot study was recommended to dewater the residuals.

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 Geotube® container estimator indicated a 30' circumference by 90' long GT500D Geotube® container which would process the water and capture the residuals based on water release and dry-down rates from the trials performed at WaterSolve's lab.



This cross section of the 12" pipeline showing the residual buildup that restricted flow to the water plant.

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The Result

WaterSolve was contracted by the facility to perform a pilot study with a 30' circumference by 90' long GT500D Geotube® container. A retention pond was built where the water exited the 12" pipeline to allow the foam pigs to be collected and more homogeneous mixture of the residuals to be pumped to the Geotube® container. The water in the retention pond was transferred to the Geotube® container with an engine driven pump and 6" hoses. The Solve 9310 polymer was injected and monitored to match the needs of the

residuals going to the Geotube® container. The foam pigs were placed in the 12" pipeline at the well field. They started with a small 10" pig and put larger pigs in as the day went on. It took approximately 40 minutes for the pig to travel from the beginning to the end. The results were excellent. The residuals were collected in the Geotube® container and left to dewater for 3 months and then hauled to a landfill. The water plant had an increase in flow of nearly 30%. Facility managers are planning this as a standard practice to clean and collect the residuals on a regular basis.

The foam pig exits the 12" pipeline into the retention pond on the left and the pipeline.



The pipeline residuals are being chemically treated and pumped into the Geotube® container.