Objective
The refinery needed to empty the residuals and fill in a lagoon to provide space for a new wastewater treatment structure. A dredge was selected to harvest the residuals in the lagoon and transfer them to a containment area where Geotube® containers would dewater the residuals for subsequent hauling to a landfill. WaterSolve was contracted to have the liner installed, provide the dredge and personnel to operate it, provide and monitor the Geotube® containers, and provide the polymer along with the Chemical Control and Tracking System (CCIS) to apply it. WaterSolve technicians were onsite throughout the project to operate the CCIS and monitor the Geotube® containers.

Conditioning Chemical
A representative group of core samples of the lagoon sediment was sent to WaterSolve’s lab prior to the project. 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. WaterSolve ran tests using Solve 137 with the lagoon core samples, and one cubic foot GDT bags.

The WaterSolve’s Chemical Control and Tracking System trailer is placed in the containment area and automatically adjusts the polymer dose to match the measurements taken from the nuclear density meter and the flow meter.

This hydraulic dredge dug the residuals from the lagoon and pumped them to the Geotube® containers in a fused 10” pipeline.

The 8” manifold is equipped with fittings and valves to divert the lagoon residual into the Geotube® containers.
The Result

A hydraulic dredge was placed in the lagoon while a liner was placed in the containment pad designed for the Geotube® containers. A 10 inch pipeline was fused to transfer the residual from the dredge to the containment pad. At the pad, the pipeline was reduced to an 8 inch manifold that had valves and fittings to divert the lagoon residual to the Geotube® containers through 6” soft hoses. WaterSolve’s (CCTS) was placed in the containment area. A nuclear density meter and flow meter were installed on the pipeline to automatically adjust the polymer dose as the dredge flow changed. The polymer make-down unit in the trailer had 60 gallons per hour capacity. Two 6” diesel driven pumps, with automatic floats, were installed to pump the filtrate water from the containment pad back to the lagoon. The material in the lagoon changed as the dredge changed depths and locations. WaterSolve technicians monitored and adjusted the polymer feed rate for optimum performance. The dredge pumped approximately 2000-GPM. The refinery had strict safety monitoring including H2S gas monitoring, fall protection, and a zero tolerance spill policy. A total of 19 Geotube® containers were filled throughout the project. Over 25,000 cubic yards of residuals were successfully removed from the lagoon and dewatered to pass the paint filter test.

Due to the risk of H2S gas, workers are spraying water with a fire hose to get water to release from the Geotube® containers.

There is excellent filtrate exiting the Geotube® containers as the Solve 137 polymer is providing good flocculation and water clarity.

A core sample is being pulled from the Geotube® container to analyze the dry weight solids and determine the ability to pass the paint filter test.

The Geotube® containers are opened to observe the solids and prepare for removal to the landfill.