



## Dewatering Lagoon Sediments

Volume 306

May, 2010

### Objective

A community college near Key West, Florida needed to dredge and deepen their lagoon used for training diving and rescue workers. The lagoon was located in an environmentally sensitive area. The permit limitations included strict turbidity limitations as well as residual polymer restrictions. WaterSolve, LLC was contracted to provide the equipment, products, and training to perform the chemical conditioning to dewater the dredged material in geotextile containers. WaterSolve, LLC facilitated the approval of the recommended chemicals through marine toxicity testing and also completed the residual polymer testing during the project implementation.

### Chemical Conditioning

Representative samples of sediment and salt water from the site were tested at WaterSolve's laboratory to determine the most effective dewatering chemistry. 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 426 followed by Solve 164 was the recommended chemical conditioning for dewatering this sediment into geotextile containers.

In order to have the products approved by the Florida Department of Environmental Protection, additional aquatic toxicity testing was required. This toxicity testing was completed by an outside laboratory using samples collected by performing a laboratory simulated dewatering operation. A slurry was prepared using additional sediment and salt water from the site. This slurry was then conditioned with the recommended products and doses based on the previous bench testing and passed through the geotextile fabric. Filtrate from this simulated dewatering operation was collected and delivered to the laboratory for toxicity testing.



The polymer make-down unit is shown.

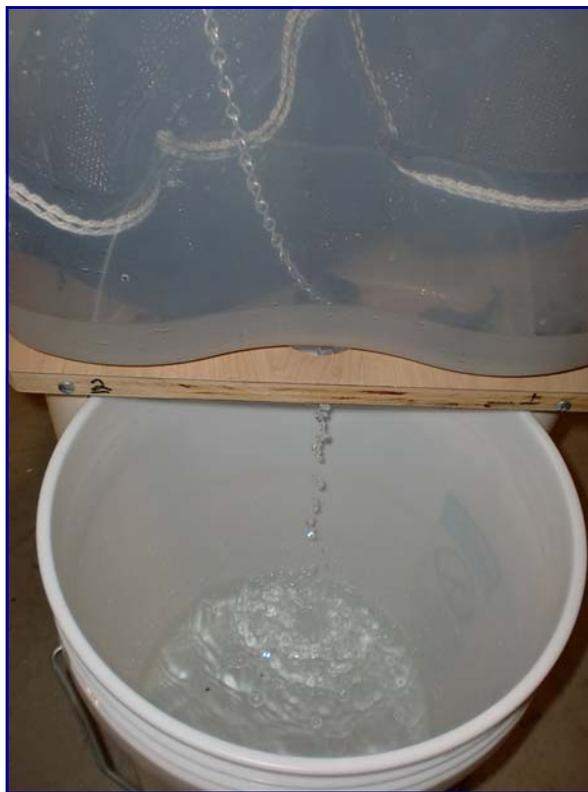


The metering pump for Solve 426 was placed at the site.

## Project Implementation

WaterSolve provided the dewatering polymers (Solve 426 and Solve 164) and the chemical feed equipment for this project. The equipment included a 25-gph motor driven diaphragm pump for the injection of the Solve 426 (organic coagulant) and a polymer make down unit to prepare and inject the activated Solve 164 (flocculent). WaterSolve also provided the initial set-up and start-up assistance of the chemical feed equipment for this project.

Monitoring required for this project included turbidity and residual polymer testing. The residual polymer testing was completed according to “*Determination of the Presence of Polymer Using the Flocculation Method*”. This procedure includes qualitative and quantitative methods. The qualitative method was completed in the field using equipment and known concentration samples prepared by WaterSolve for a gross determination of the polymer present in the water sample collected at a pre-determined location. The quantitative testing was completed at WaterSolve’s laboratory. The quantitative method is more precise and is meant to be conducted in a laboratory setting under controlled conditions. This quantitative testing was completed weekly during the entire dredging and dewatering operations.



The Geotube® Dewatering Test (GDT) apparatus is shown on the left. The conditioned sediment is poured into the container thru the riser pipe. The solids remain in the Geotube® container and the water is released and is collected in the bucket shown. The photograph on the right shows the filtrate water collection. This water was placed in one gallon containers and forwarded to Marinco Bioassay Laboratory, Inc. for marine toxicity testing.