

### **Project Name**

Fena Water Treatment Plant Process Evaluation  
Guam

### **Client / Owner**

U.S. Navy, Pacific Division, Pearl Harbor, Hawaii

### **Year Completed**

2004

### **Project Description & Firm's Responsibility**

Operations at the U.S. Navy's Fena Water Treatment Plant were severely impacted in the aftermath of super-typhoon Chata'an in July 2002. Turbid source water laden with colloidal silt from Fena Lake made it difficult for plant operators to treat adequate amounts of water to a quality meeting the National Primary Drinking Water Standards. The normal water production level of 11.5 mgd was substantially reduced to less than 6 mgd due to solids carryover from the overloaded flocculation-sedimentation pretreatment tank and short sand filter runs due to media clogging. Ensuing water shortages to the navy and civilian communities on Guam required that short-term, expedient remedial measures be taken to sustain plant production whenever high turbidity raw water quality episodes resurfaced after heavy rain in the Fena Valley watershed that stirs the lake bottom.

Efforts involved working with plant operators to evaluate the constraints of the plant piping layout with regard to redirecting settled sludge of the filter backwash waste stream; measuring filter backwash, settled sludge, and supernatant pump outputs; testing chemical coagulant dosages with changing raw water quality characteristics; and evaluating each unit process under stressed conditions.

A collaborative plan was devised to waste excess alum and mud sludge from the filter backwash settling tank to the sanitary sewer to eliminate the recycle of silt-laden return water to the plant headworks. Hydraulic surges from the supernatant return pumps and the recycle of solids to the pretreatment tank and filters would be eliminated during times of high turbidity raw water requiring treatment. Operators implemented a plan to dispose of chemical sludge in this manner using portable pumps and hoses until construction of a permanent installation. At the navy's request, ensuing work included design of sludge pumps for the pretreatment tank and the filter backwash settling tank capable of disposing chemical sludge to the navy sewer at Naval Magazine Road.

