» CASE STUDY

Caribou, New Brunswick (Breakwater Resources)

PROJECT OBJECTIVES	Removal and recovery of Zn, Cu, Pb and Cd from underground acid mine drainage, upstream of existing LDS lime plant; waste rock leachate and mine water treatment using existing LDS plant.
PROJECT SIZE	· 700 m^3/day flow containing up to 1 g/L Zn and 1.5 g/L Fe
TECHNOLOGY	BioSulphide® plant and LDS system settling ponds
COST	$0.7 million Cdn (2001)
RESULTS	2002 Operating Results · 14,718 m^3 of water treated · 35 tonnes of Zn recovered

The LDS pond system was converted to the HDS process.

The Caribou operation provided a large-scale commercial demonstration of BioteQ's BioSulphide® process, using biologically generated H_2S to recover dissolved metals from mine impacted water.

Built in 2001, the Caribou Mine project was BioteQ's first commercial plant, applying the BioSulphide® process to treat acid mine drainage containing high concentrations of zinc, copper, cadmium and lead. BioteQ financed, constructed and operated the BioSulphide® plant to treat wastewater to meet strict water quality criteria and concurrently recover metals into a concentrate upstream of a lime treatment plant. In 2002 alone, 35 tonnes of zinc concentrate were recovered at the plant. The recovered metals were sold to Noranda at Brunswick Mining and Smelting.

The BioSulphide® process significantly reduced lime reagent consumption and sludge production in the lime plant. By removing the heavy metals prior to lime treatment, the sludge produced in the lime plant was essentially free of toxic metals and the liabilities and costs typically associated with lime treatment were scaled down.

The plant concluded operations in 2003, successfully demonstrating the commercial scale of the technology. BioteQ continued to operate water treatment plants and provided environmental management services at both Caribou and the nearby Restigouche mine site until 2007. Additional services BioteQ provided included, retrofit and operation of a low density sludge (LDS) water treatment system that included a settling pond, conversion of a LDS plant into a new high density sludge (HDS) lime plant, and remediation of a sizeable deposit of old tailings. Management of the site was transferred to the new miner owners in 2007.

The Caribou plant is the first full-scale operation designed, built and commissioned by BioteQ.

Figure 1: Caribou Plant Process Flowsheet