ZEQUANOX®
Invasive Mussel Control

Enclosed Systems: At Work in Power

Zequanox® Molluscicide Delivers Effective, Low-Risk Invasive Mussel Control

Once invasive mussels enter an enclosed water system, thick colonies can form that damage infrastructure and equipment, and restrict water intake in heat exchangers, condensers, cooling systems, and even fire suppression systems. Infestations can trigger unexpected outages, and, in some cases, reduce power generation.

Zequanox molluscicide offers a safe, low-risk solution for mussel control. Marrone Bio Innovations, Inc. has partnered exclusively with Solenis LLC, a global expert in water treatment and process chemistries, to provide Zequanox molluscicide treatment programs for enclosed industrial water systems in the U.S. and Canada. This document highlights case studies from power facilities where Zequanox molluscicide was used to control zebra and quagga mussels.

Ontario Power Generation

■ **Annual Treatment:** A single annual treatment was performed on August 1, 2012, to control adult zebra and quagga mussels in the facility's cooling water system.

■ **Result:** The treatment resulted in mussel mortality greater than 90% . Mortality reached 91% by day 7; final mortality was calculated as 94% at day 28.

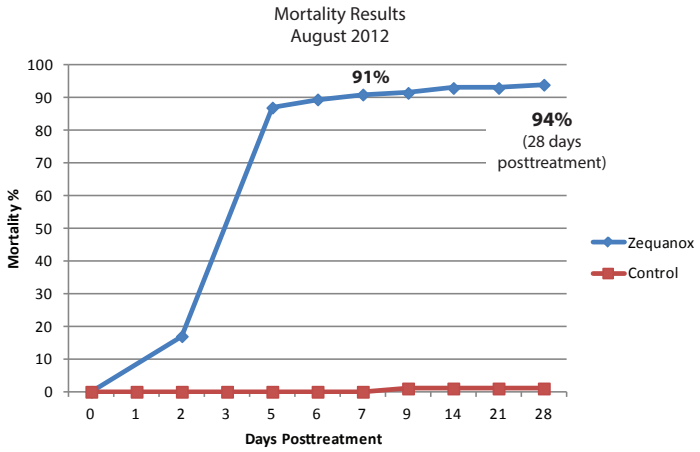
DeCew II Falls Generating Station

Hydropower, 144 MW

Two turbines with a 1,940-gpm cooling water system

Water source: Lake Moodie

Located in St. Catharines, Ontario, Canada



Oklahoma Gas & Electric

■ **Annual Treatment:** To control a zebra mussel infestation, two cooling water system intake bays (~200K gallons each) were treated on October 17, 2012.

■ **Result:** A single treatment of the static (low-flow) system achieved greater than 95% mortality. Mortality reached 92% by day 5 and was measured at 98% at day 14.

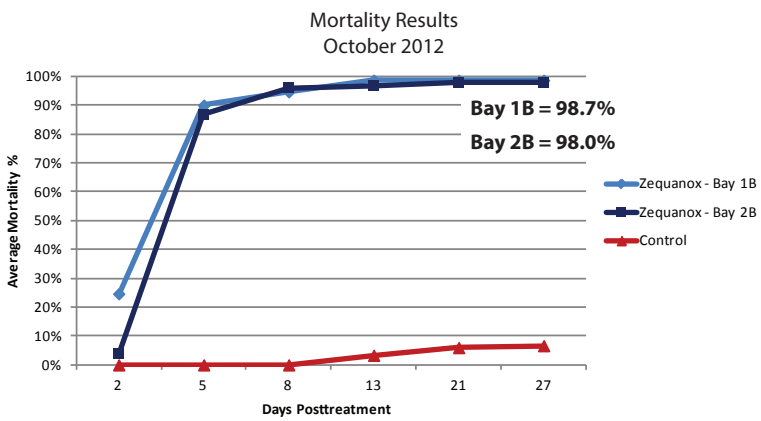
Sooner Power Plant

Coal fired, 1,138 MW

Four cooling water intake bays

Water source: Sooner Lake (fed by Arkansas River)

Located in Red Rock, Oklahoma



U.S. BUREAU OF RECLAMATION

■ **Annual Treatment:** A single annual treatment was performed in September 2011 to demonstrate control of adult zebra mussels in one of the plant's cooling water subsystems.

■ **Result:** The annual treatment resulted in 76% mortality.

■ **Bi-weekly Treatment:** A trial program of biweekly, low-level treatments was executed from early July to early November 2012.

■ **Result:** Settlement was reduced by 90%.

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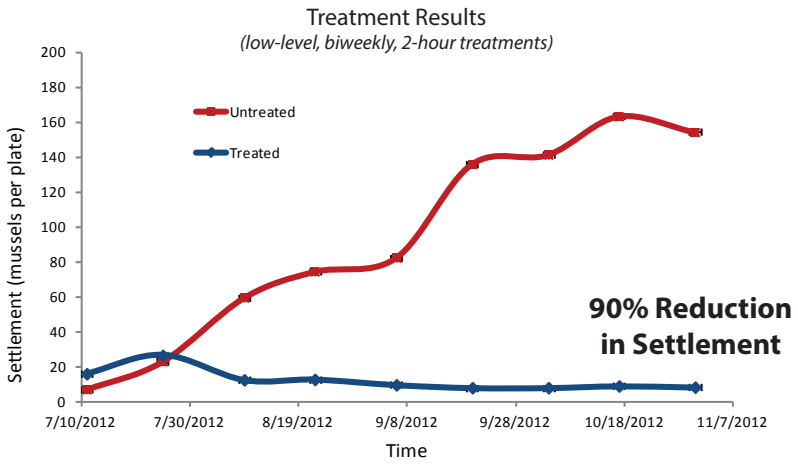
DAVIS POWER PLANT

Hydropower, 255 MW

Five turbines; each with a 3,800-gpm cooling water system

Water source: Lower Colorado River

Located in Bullhead City, Arizona



ILLINOIS POWER GENERATING STATION

■ **Biweekly Treatment:** Low dose, biweekly treatments occurred from late June to early October to prevent mussel settlement in the once-through cooling service water system (SWS), while also gradually providing control of adult mussels. Settlement monitoring occurred at the approximate mid-point of unit 7 and at the end of unit 8 in the SWS.

■ **Result:** Settlement was reduced in the SWS by 95% in unit 7 and by 52% in unit 8. Average adult mortality was 93% in unit 7 and 91% in unit 8.

COAL-FIRED POWER PLANT

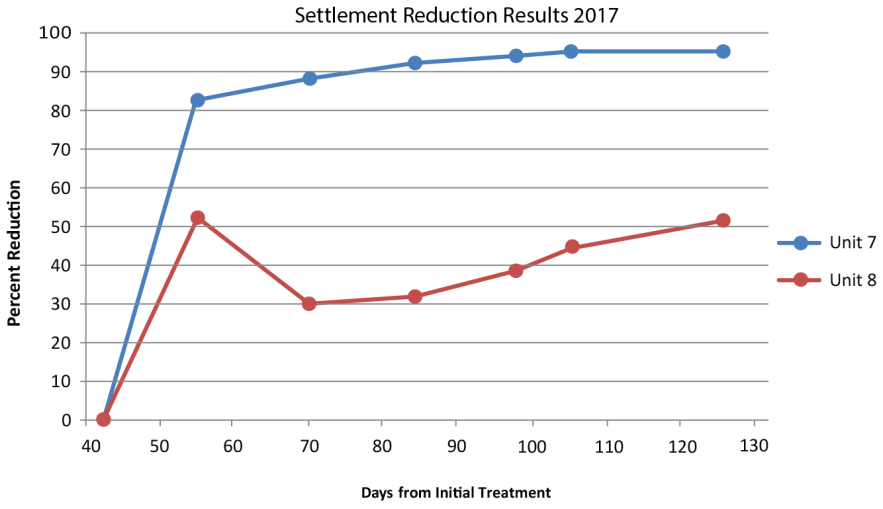
790 MW

SWS, Unit 7: 8,000 gpm

SWS, Unit 8: 10,000 gpm

Water Source: Lake Michigan

Located in Greater Chicago, Illinois



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