

**Draft: Big Lake, Polk County (WBIC 2615900),
Dipotassium Salt of Endothall Herbicide Concentration Monitoring Summary, 2014**

9 February 2015

John Skogerboe

Big Lake is listed as a mesotrophic, drainage lake on the DNR website. An inlet stream comes from Wind Lake to the south and an outlet stream flows out of the west side of Big Lake to Horse Creek. The lake has an area of 245 acres, maximum depth of 24 ft and a mean depth of 17 ft. On 22 May 2014, 6 areas in Big Lake were treated with a liquid formulation of dipotassium salt of endothall (endothall) applied as Aquathol K to control curly-leaf pondweed (*Potamogeton crispus*) (Figure 1) (Chemical Aquatic Plant Control Permit Application and Aquatic Plant Management Herbicide Treatment Record). The target concentration (application rate) was 1.5 mg/L active ingredient (ai). Water sample sites were established at 5 locations to monitor endothall concentrations and exposure times (Figure 2).

Treatment Site	Treatment Area, acres	Herbicide Sample Sites	Treatment Date
B1	5.18	B1	5/22/2014
B2	1.5	B2	5/22/2014
B3	0.65	none	5/22/2014
B12	3.0	B12	5/22/2014
B14	0.36	none	5/22/2014
B15	3.37	B15A, B1B	5/22/2014

The water temperature at the time of herbicide application was reported in the Aquatic Plant Management Herbicide Treatment Record to be 55°F (12.8°C). The wind was reported to be 3 mph from the NW. Wind speed and direction was reported to be 0 to 5 mph from the NW by volunteer water sample collectors. Weather data for Osceola, WI (www.wunderground.com) indicated that wind velocity was 0 to 10 mph beginning from NW on 22 May.

Water samples were collected using an integrated water sampler which collects a water sample from the entire water column. Water samples were collected from sample sites at time intervals of approximately 1, 3, 6, 9, 12, and 24 hours after treatment (HAT). Depending on time of herbicide application some sample intervals were omitted due to darkness. Water samples were taken to shore after completion of each sample interval, and 3 drops of sulfuric acid were added to each sample bottle to fix the herbicide and prevent degradation. Samples were then stored in a refrigerator, until shipped to the State Laboratory of Hygiene (SLOH), Madison, WI for analysis of endothall. Endothall application rates are based on mg/L active ingredient (ai), while herbicide concentrations in water samples are reported as mg/L or ug/L acid equivalent (ae). An endothall concentration of 1.5 mg/L ai is equal to 1.065 mg/L ae or 1065 ug/L ae.

Peak endothall concentrations in samples collected from sample sites B1, B2, and B12 ranged from 300 to 460 ug/L ae at 1 HAT compared to the target concentration of 1065 ug/L ae (Figure 3). The endothall concentration at all sample sites declined to near the 100 ug/L ae, baseline by 3 HAT.

Peak endothall concentrations in samples collected from sample sites B15A and B15B ranged from 100 and 560 ug/L ae at 1 HAT compared to the target concentration of 1065 ug/L ae (Figure 4). The endothall concentration at sample site B15B declined to less than the 100 ug/L ae, baseline by 3 HAT. The endothall concentration at sample site B15A was greater than the 100 ug/L ae, baseline through 6 HAT.

Based on endothall concentration data, dissipation from herbicide target areas was rapid. The target treatment areas were small ≤ 5 acres so exposure times were mostly between 1 and 3 HAT even with low velocity winds. One area represented by B15 was more protected on three sides by land and exposure times were measured at greater than 6 HAT.

Figure 1. Big Lake 2014 Endothall Treatment Locations

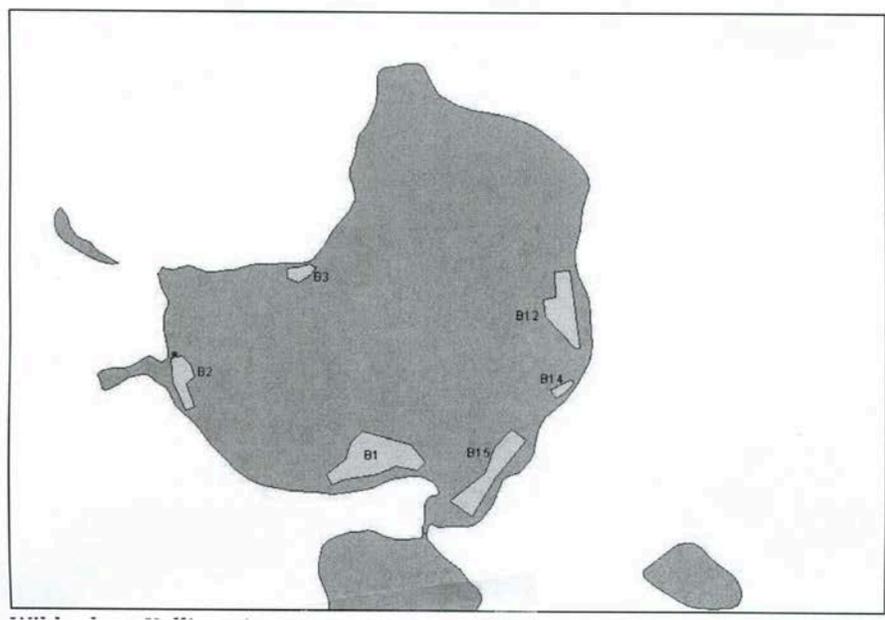
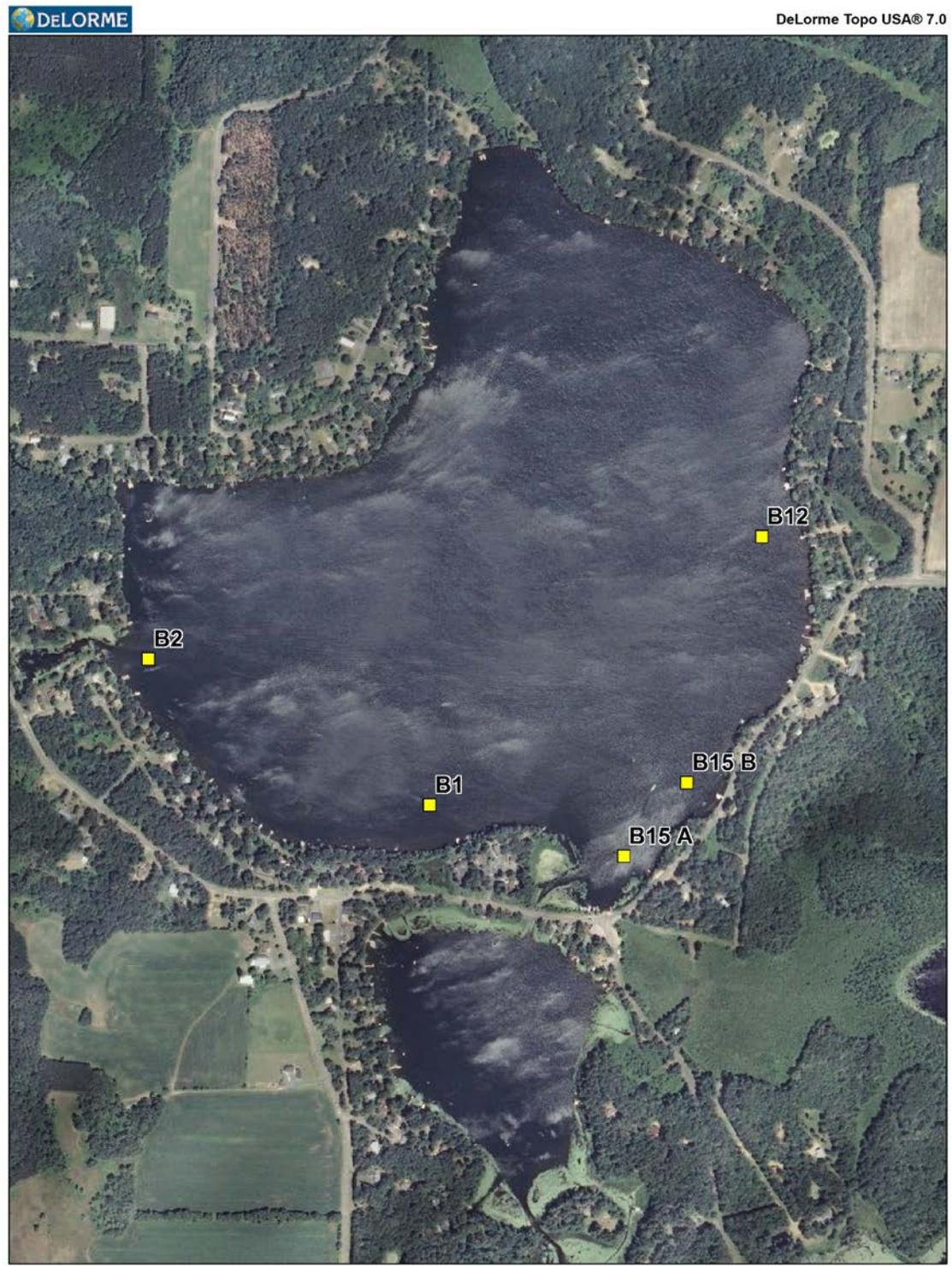


Figure 2. Big Lake 2014 Endothall Sample Locations



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MN (0.4° W)

0 200 400 600 800 1000 1200 1400 ft
Data Zoom 14-5

Figure 3

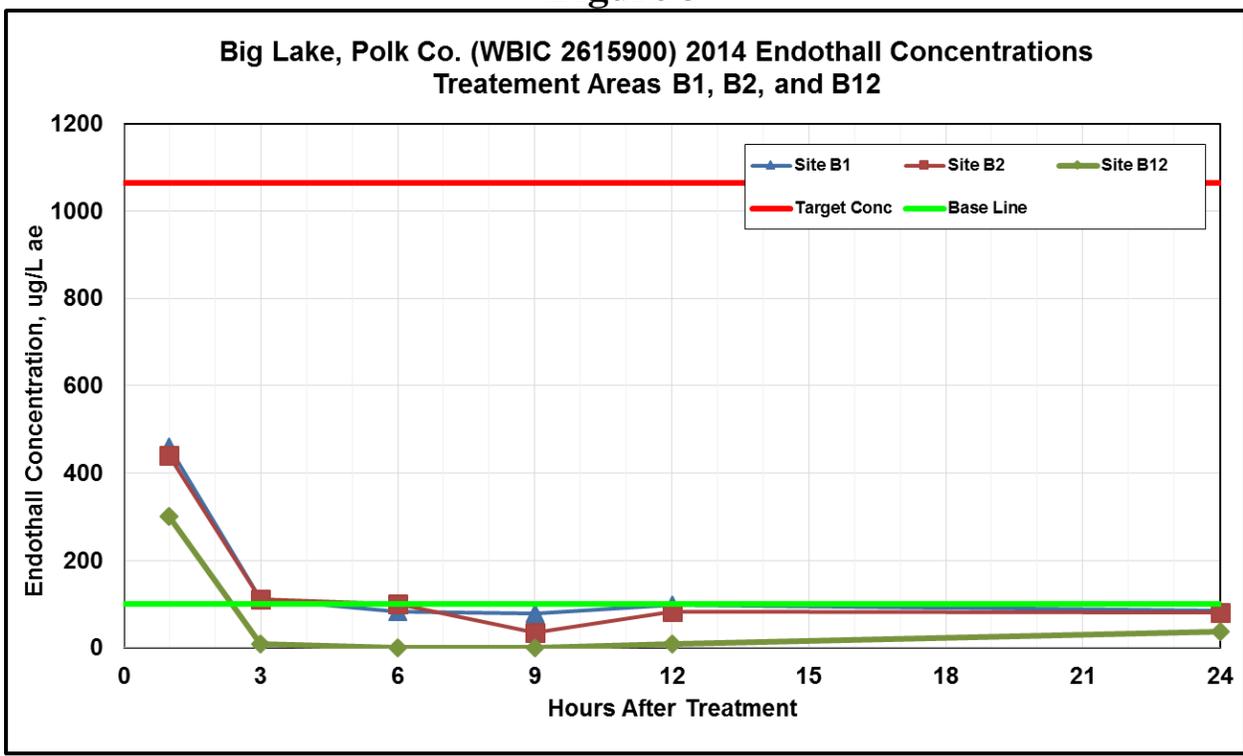


Figure 4

