

**Draft: Big Chetac Lake, Sawyer and Barron Counties (WBIC 213300),
Dipotassium Salt of Endothall Herbicide Concentration Monitoring Summary, 2014**

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Big Chetac Lake is listed as a eutrophic drainage lake on the WI DNR web site. The lake has an area of 2690 acres, a volume of 37101 acre-ft, a mean depth of 13.8 ft, and maximum depth of 28 ft. On 21 May 2014 an area on the north end of Big Chetac Lake (90.0 acres) was treated with a liquid formulation of dipotassium salt of endothall (endothall) applied as Aquathol K to control curly-leaf pondweed (*Potamogeton crispus*). The target concentration (application rate) was 1.0 mg/L active ingredient (ai). Water sample sites were established at 9 locations to monitor endothall concentrations. Three sites (BC1, BC2, and BC3) were located in the endothall treatment area to quantify the concentration, exposure time (Figure 1). Six additional sites (BC5, BC6, BC7, BC8, and BC9) were located outside of the treatment area to detect possible drift of endothall into key non target areas. Site BC9 was located near a known wild rice bed (*Zizania* sp), and Site B8 was located in a designated untreated reference area.

The water temperature at the time of herbicide application was reported in the Aquatic Plant Management Herbicide Treatment Record to be 57.4°F (14.1°C). The wind was reported to be 4 to 9 mph from the SW. Water temperature collected during water sampling showed that water temperatures ranged from 13.3 to 19.4°C throughout the monitoring period (Figure 2). Wind speed was reported to be 0 to 10 mph (Figure 3).

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 in or near the target area (BC1, BC2, BC3, and BC4) at intervals of approximately 0.25, 0.5, 1, 2, 3, 5 and 7 days after treatment (DAT). Water samples were collected from untreated sample sites south of the target area (BC5, BC6, BC7, BC8, BC9) at intervals of approximately 1, 2, 3, 5 and 7 DAT. 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 mg/L ai is equal to 0.71 mg/L ae or 710 ug/L ae.

Peak endothall concentrations in the treatment areas occurred from 0.25 to 1 DAT and ranged from 200 to 590 ug/L ae compared to the target concentration of 710 ug/L ae (1000 ug/L ai) (Figure 4). The mean endothall concentration in the treatment area ranged from 173 to 251 ug/L ae from 0.25 to 1 DAT, however mean endothall concentrations in the application area declined to less than a baseline concentration, 100 ug/L ae, between 1 and 2 DAT. Endothall concentrations in the nearby untreated sample site (BC4) were 860 ug/L ae at 0.25 DAT indicating rapid herbicide dissipation into nearby non target areas.

Peak endothall concentrations in the northern non target treatment areas (BC5, BC6, and BC7) ranged from 42 to 80 ug/L ae compared to the detection limit of 10 ug/L ae (Figure 5). Low levels of endothall apparently dissipated throughout the northern area of the lake by 1 to 2 DAT. Endothall

concentrations in sample sites from the southern non target treatment areas were less than the detection limit through 2 DAT, however concentrations in samples collected from site BC8 exceeded the detection limits from 3 to 7 DAT. Endothall concentrations in samples collected from site BC9 near the wild rice beds remained at or below the detection limits throughout the sampling.

The peak mean target area concentration was 251 ug/L ae at 0.25 DAT compared to the target concentration of 710 ug/L ae (Figure 6). Mean target area concentrations were less than 100 ug/L ae by 2 DAT. Endothall dissipated rapidly from the treatment target area, and effective exposure times were likely between 1 and 2 DAT. Endothall dissipated rapidly and widely through much of lake, although concentrations greater than the detection limits were not measured in the sample location near the wild rice bed.

Figure 1. Chetac Lake 2013 Endothall Sample Locations

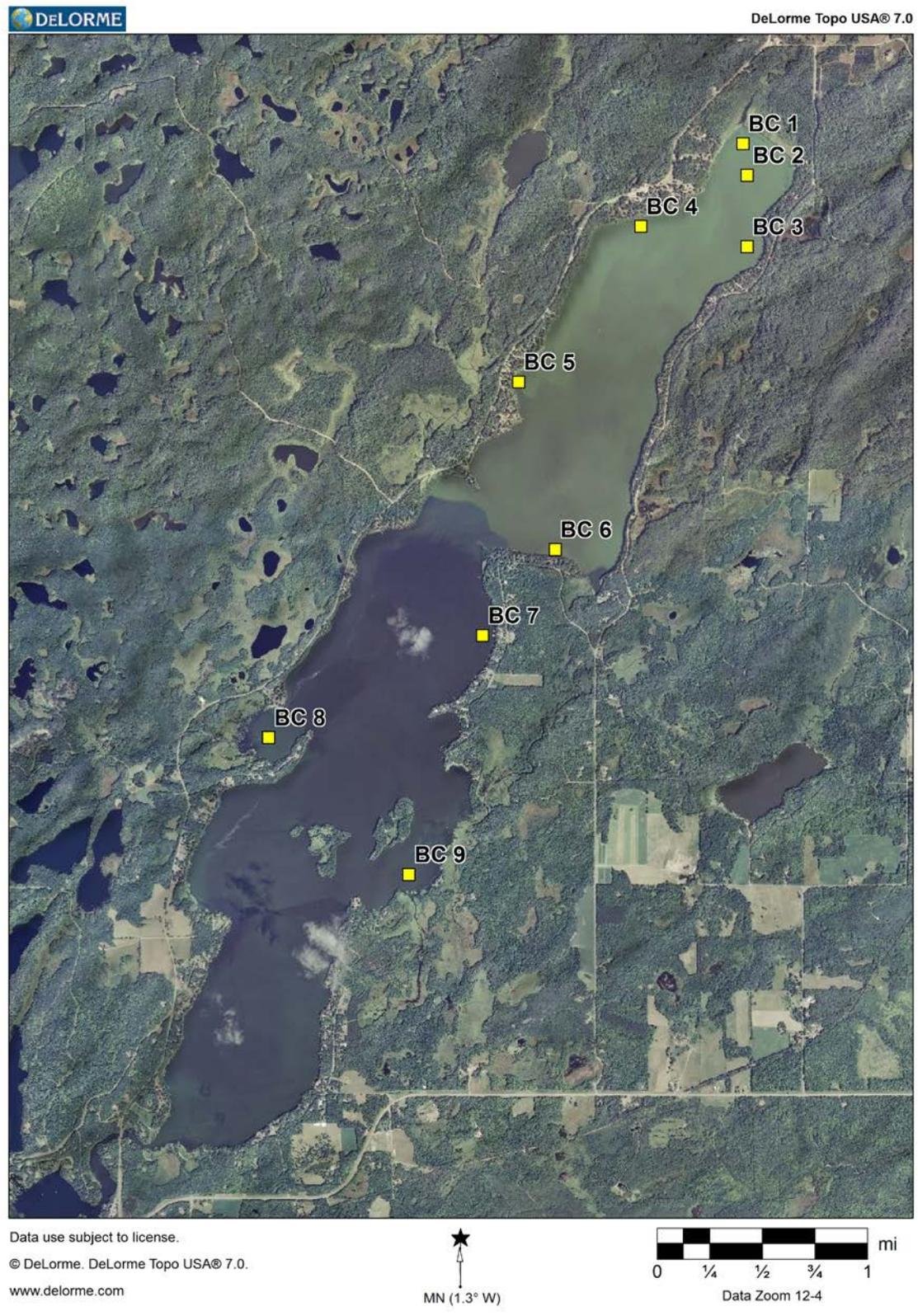


Figure 2

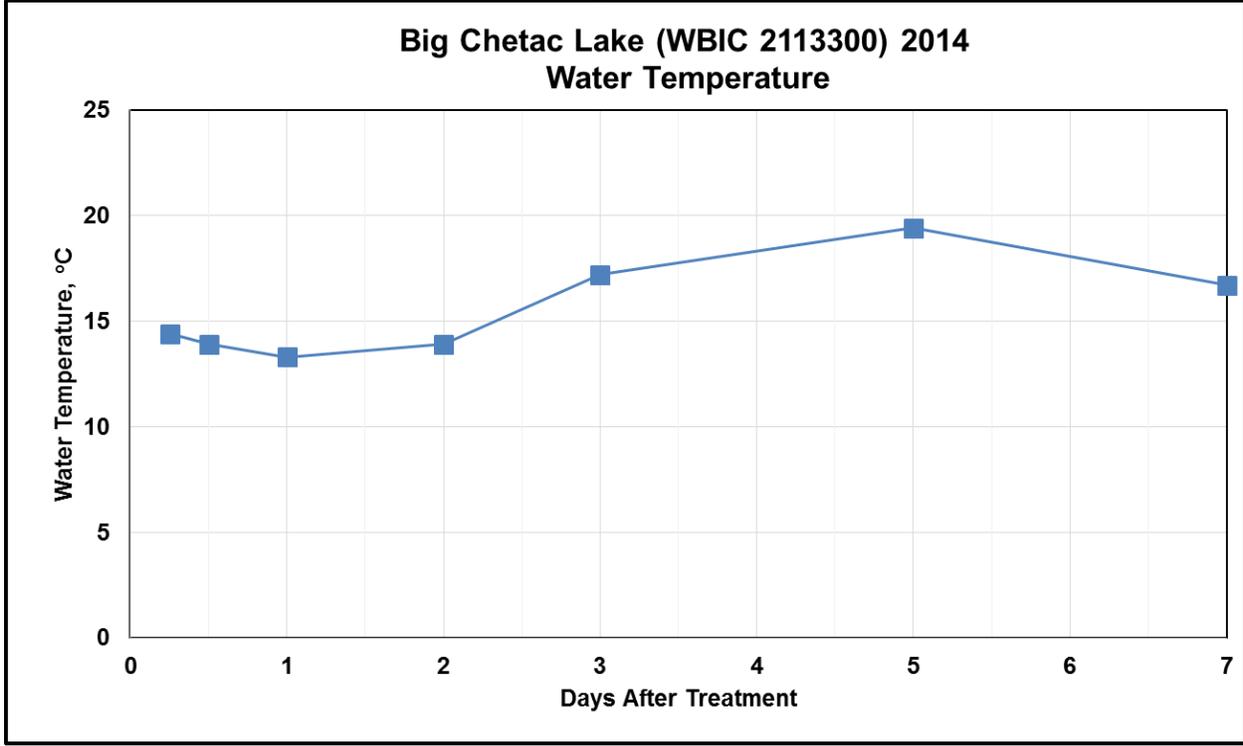


Figure 3

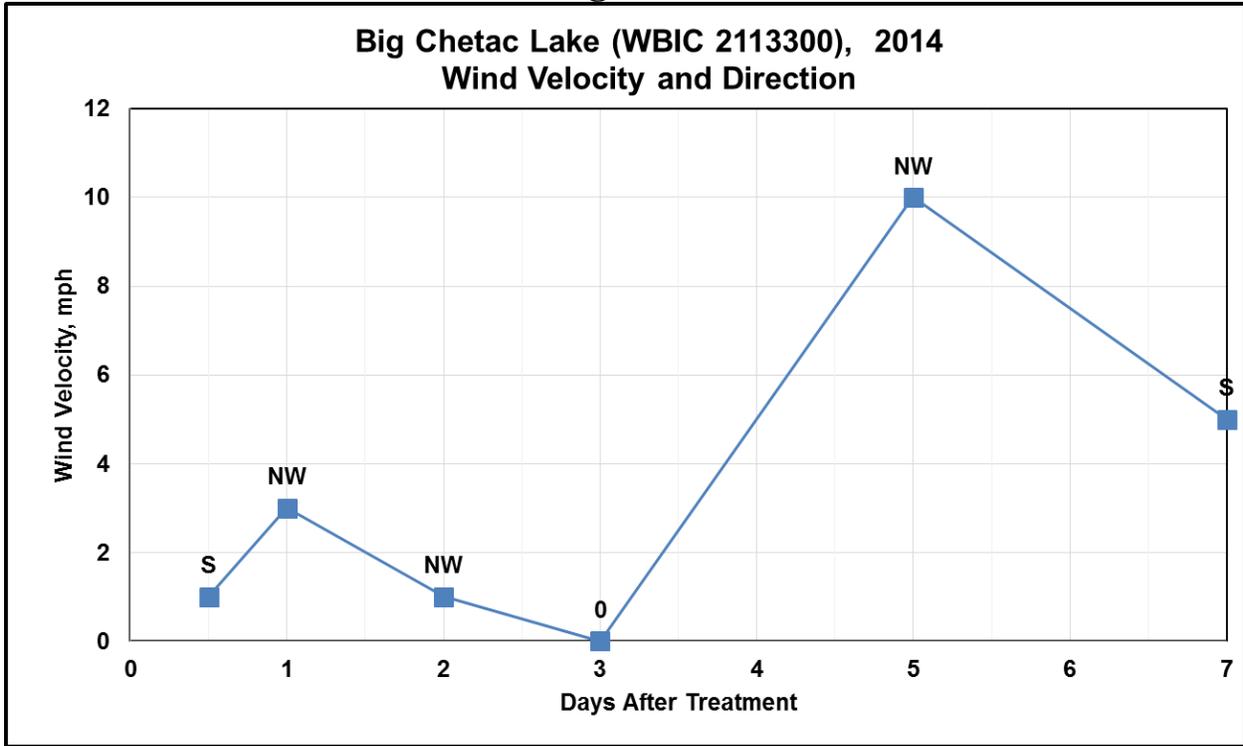


Figure 4

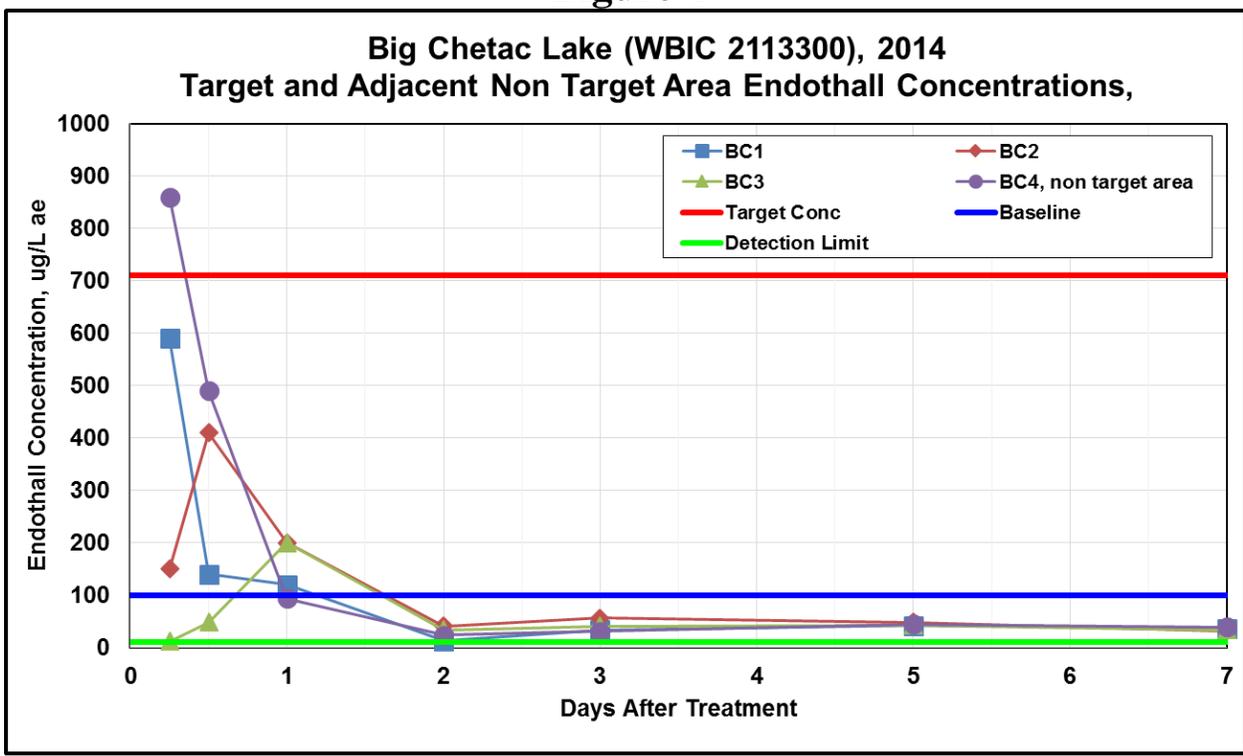


Figure 5

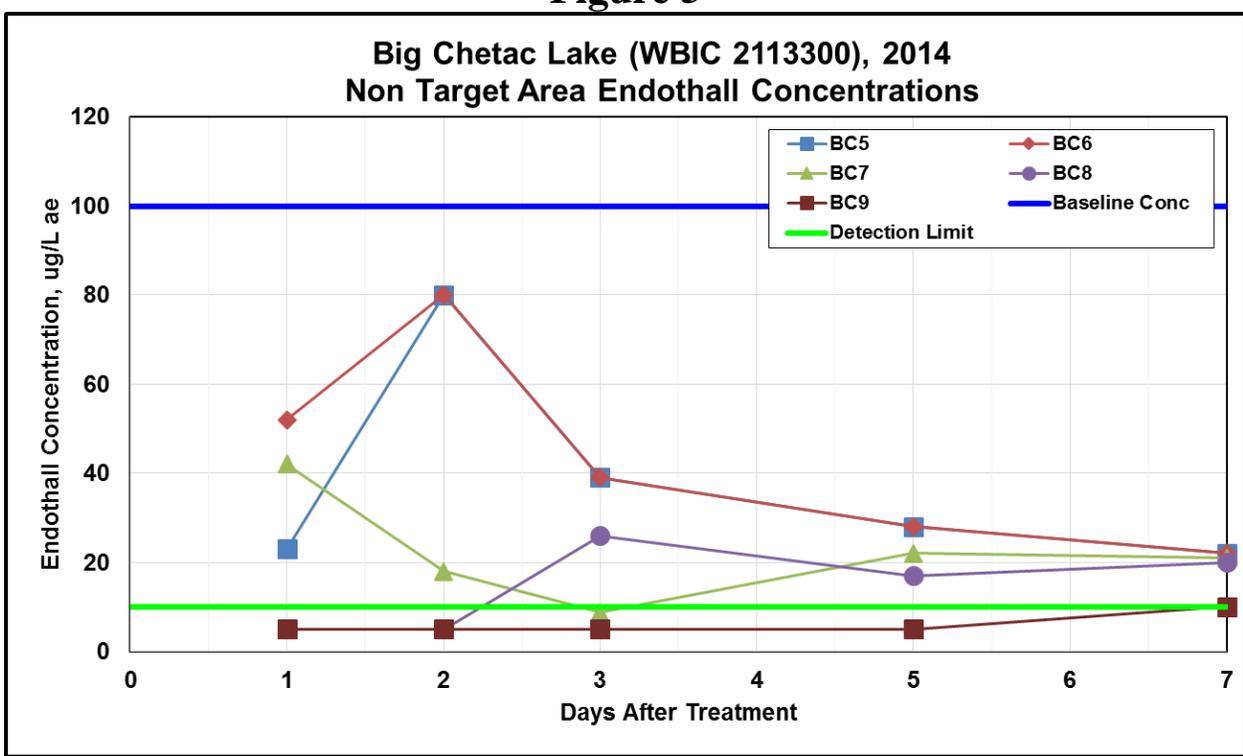


Figure 6

