

## LitLine™ Littoral Zone Treatment Technology Overview

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The application of herbicides to water for controlling nuisance vegetation, especially submersed plant species, has challenges that are not associated with agricultural weed control practices. Once in the water, herbicides are subject to rapid dilution, wind and wave energy moving herbicides off target, hydrolysis, photolysis, microbial degradation, etc.; the first two mechanisms of herbicide loss usually being the most important. With conventional herbicide application equipment, herbicides were pumped through weighted hoses trailing behind the boat releasing the herbicide into the top 4-6 feet of the water column. This approach relied on simple diffusion to carry the herbicide to the bottom of the lake where the plants are growing; which works fine in slow to quiescent waters. However, when water flow is an issue herbicide contact and exposure times are not met resulting in poor control of the target plant due to dilution and the herbicide moving off target. Therefore, to alleviate this problem Clean Lakes Inc. developed the LitLine™ (Littoral Zone Treatment Technology) System (Patent Pending) to inject herbicides deeper into the water column for increased plant control.

The LitLine™ System was developed using the relationship between the speed of the boat during application and the length of hose being deployed for the application. For example, during a trial in Hayden Lake, ID using an application speed of 5 mph and 40 feet of hose, the herbicide was being discharged in 10 feet of water. Similarly, in Lake Pend Oreille, ID using an application speed of 3 mph and 90 feet of hose, the herbicide was being discharged in 15 feet of water with no equipment failures or hose snags. The herbicide was ultimately delivered close to the bottom of the lake within the target plant beds, thus increasing the contact with the plants and the exposure time necessary for adequate control. Preliminary data suggests that when the herbicide is delivered in this manner the dense beds formed by non-native plants aid in keeping the herbicide in place reducing herbicide drift and non-target injury. The advent of this system should revolutionize the way herbicides are applied to control subsurface vegetation, by not only increasing the precision and accuracy of applications, but by possibly reducing the amount of herbicides needed to achieve the same level of control using conventional application methods.

Preliminary data from Lake Pend Oreille in northern Idaho suggests that this new application system is effective at controlling Eurasian watermilfoil. A triclopyr application made in the Pack River Delta resulted in excellent control of Eurasian watermilfoil with little to no impact to the native community (Figure 1). If this new system can deliver excellent plant control at reduced herbicide rates further selectivity may be achieved, and possibly reduce the negative public outlook on herbicide use.

**Figure 1.** A plant rake displaying dead Eurasian watermilfoil with live intact Richardson's pondweed and elodea approximately 3 weeks after a triclopyr application in the Pack River Delta, Lake Pend Oreille, Idaho, August 2008.

