Summary of meeting with James Kreitlow (WDNR) about the algae 2010 survey.

Both Spirit Lakes have many types of algae growing during the summer months.
They also have very high phosphorous concentrations.
North Spirit has 110 parts per billion (ppb) and South Spirit has 200 ppb.
The normal standard for recreational lakes is 40 ppb.

The survey also analyzed the flow of the water in each lake.
They looked at the flow of the water out of each lake and determined how many days it takes for the outflow to equal the entire volume of each lake. They call this the flushing rate. North Spirit has an average of 77 days and South Spirit has an average of 10 days.

Both the quantity of phosphorous and the flushing rate of the lake affect algae growth. Phosphorous is food for the algae and algae will grow better in slower moving water.

The high phosphorous level is the issue, which we may (and I stress MAY) be able to address. There are basically two ways phosphorous is introduced into our lakes.
First there is groundwater. This includes runoff from the shoreline, well water seepage, springs running into the lake, and streams running into the lake. The survey showed that all of these sources are high in phosphorous. Of course North Spirit doesn't have a major stream running into it like South Spirit. That is the main reason for the slower flushing rate on North Spirit. They found the creek flowing into the channel, well water from many wells tested, and most of the springs around the lake have high phosphorous concentrations. There is virtually nothing that can be done to change those effects of groundwater.
The second way phosphorous is introduced into the lakes is internal loading. Basically this is phosphorous that is stored in the sediment at the bottom of the lake and reintroduced into the water. In shallower areas this can be done by natural and mechanical mixing of the water. However it is felt that the main method for this reintroduction of phosphorous is in deep water. During the summer months there will be temperature differences from the top of the lake (warm water) and the bottom of the lake (cold water). Our testing has shown that North Spirit will have temperatures in the upper 70's near the top and lower 50's at the bottom. Under these circumstances at just the right location and temperature change there will be a loss of oxygen in the water, which will result in the water being able to take phosphorous out of the sediment.

There is a process called Alum treatment in which a liquid aluminum sulfate is introduced into the lake. It combines with and removes some of the phosphorous in the water and changes into a coating that settles to the bottom of the lake. This coating will seal the sediment and not allow the phosphorous in the sediment to reintroduce into the water. Doesn't that sound like the answer to our dreams?

There is one concern with determining if North Spirit is a reasonable candidate for such a treatment. We must first determine how much of the phosphorous in the lake is from groundwater and how much is from internal loading. If a large percentage of the phosphorous is from groundwater then it probably won't be worth the $100,000.00 to $200,000.00 it will take to do the treatment. We need to get a satisfactory reduction in phosphorous to slow the growth of algae. If we get a slight reduction we might see a quick fix reaction with less algae growth. But if it isn't a major reduction in the algae growth, the new algae will slowly create a new layer of sediment on top of the Alum seal and shorten the useful lifespan of the treatment. Then we are back to doing another treatment. We need to see an expected reduction that will give us 15 years plus or minus before we need to reconsider another treatment.

In order to find out what the percentages are of the groundwater source of phosphorous and internal loading source of phosphorous, we need to do a further study. This study will be conducted by a hydrology firm competent in such studies. The expected cost of such a study is $20,000.00. There are grants available for both the study and the treatment. The grants would be expected to cover 75% of the costs. Our board of directors will be discussing this matter at future meetings to determine if we should file for the study grant and proceed with the study. Please let your directors and officers know your feelings on this matter.