



**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, JUNE 19, 2013**

SUBJECT **WATER QUALITY TRENDS IN SOOKE LAKE RESERVOIR IN APRIL AND MAY 2013**

ISSUE

To provide information on the water quality conditions observed in Sooke Lake Reservoir during April and May 2013 and compare these data with those from previous years and long-term averages.

BACKGROUND

Physical Parameters

Water Levels. The water level in Sooke Lake Reservoir (**Figure 1**) started to decline in late April and was 0.4 m below full pool at the end of May. This decline was slightly earlier than in previous years. (**Note:** in all charts, 2013 data are shown in red)

Water Temperature. In April and May 2013, the weekly average water temperature was slightly higher than the long-term average as well as in 2011 and 2012 (**Figure 2**). (**Note:** The small circles on the chart show the extent of water temperature variation in previous years.)

Water Clarity

Turbidity. During April and May, the turbidity in Sooke Lake Reservoir continued to remain well below the 1.0 NTU turbidity limit and was slightly lower than the long-term average (**Figure 3**).

Water Transparency. Similar to turbidity, the transparency of the water in Sooke Lake Reservoir in April and May continued to be much better (clearer) than the long-term average (**Figure 4**) and was broadly similar to that in 2010-2012. The transparency of the water is continuing to return to the very clear water observed prior to raising the water level in the reservoir.

Bacteria

Total Coliform Bacteria. In April and May, the total coliform concentration in the raw source water entering the Japan Gulch Disinfection Plant from Sooke Lake Reservoir was low. This is similar to the past several years and the long term average (**Figure 5**). *E. coli* concentrations remained low in April and May and below the USEPA limit to remain an unfiltered supply (see insert in **Figure 5**).

Nutrients

Phosphorus. In April and May 2013, the total phosphorus level in both the north and south basins of Sooke Lake Reservoir remained lower (better) than the long-term average and similar to the levels seen in April and May 2010-2012 (**Figures 6 and 7**).

Nitrogen. In April, the total nitrogen levels in both the south and north basins rose to levels broadly similar to the long-term average and 2011 and higher than those in April 2010 and 2012 (**Figures 8 and 9**). These levels dropped throughout May in both the north and south basins to levels lower than the long-term average.

Chlorophyll-a

In April and May, chlorophyll-a concentrations throughout Sooke Lake Reservoir were lower than the long-term average (**Figures 10-12**), broadly similar to April and May 2011 and lower than the chlorophyll levels in April and May 2010 and 2012. These concentrations are relatively low for a surface water reservoir and reflect the normally low levels of nutrients (especially phosphorus) in this water body.

Algae

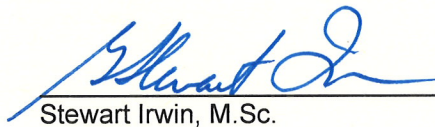
In April, algal concentrations throughout Sooke Lake Reservoir were low. Similar to previous years *Asterionella formosa* (a diatom) was dominant during this time. *Dinobryon bavaricum* (a golden-brown alga) concentrations increased in the beginning of May to above average levels but peaked mid-month and gradually declined to average levels by the end of May. There were no algae-related water quality issues in April and May.

CONCLUSION

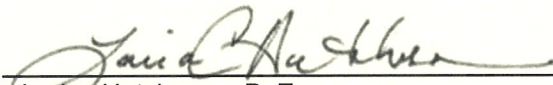
The water quality tests conducted for Sooke Lake Reservoir in April and May 2013 continue to show good quality source water with no water quality issues.

RECOMMENDATION

That the Regional Water Supply Commission receive the staff report for information.



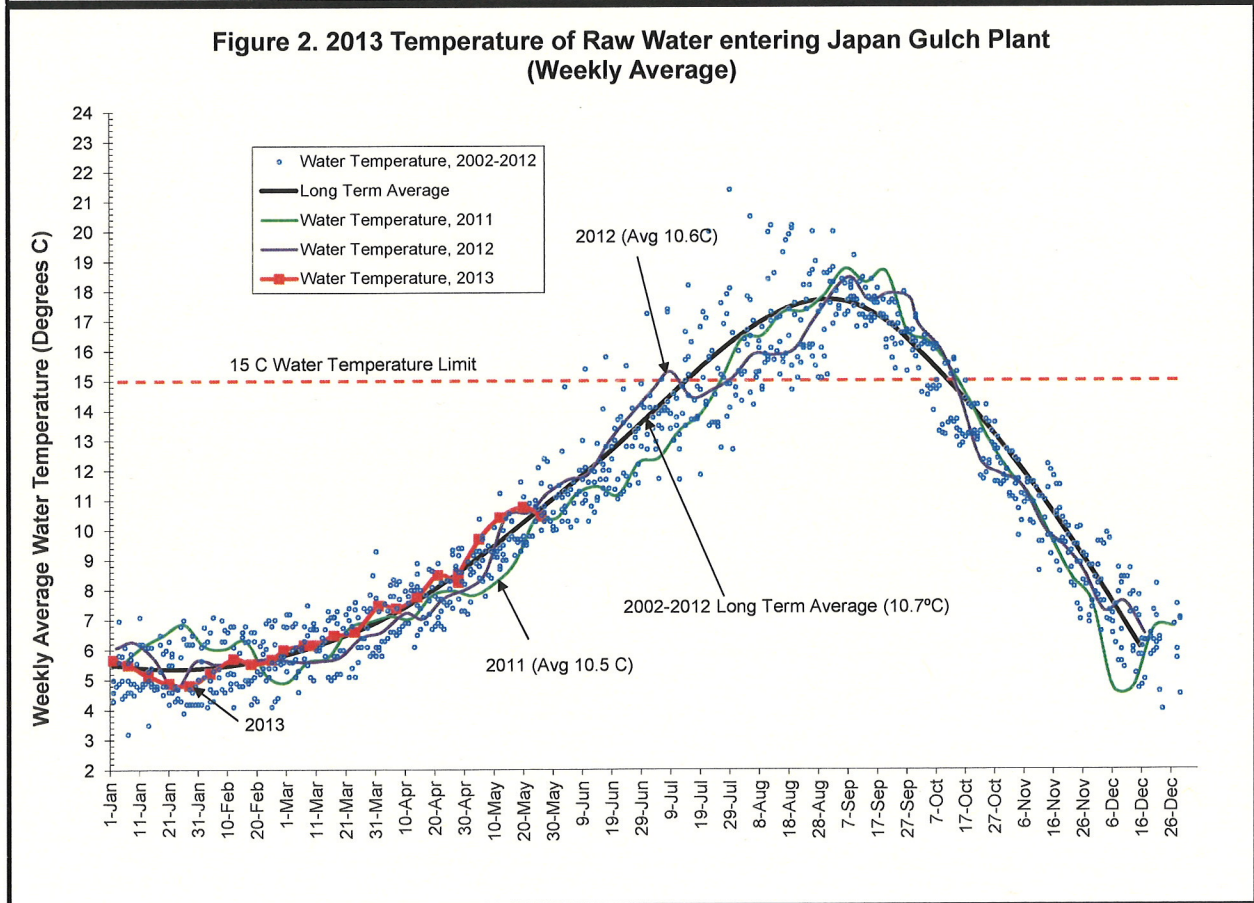
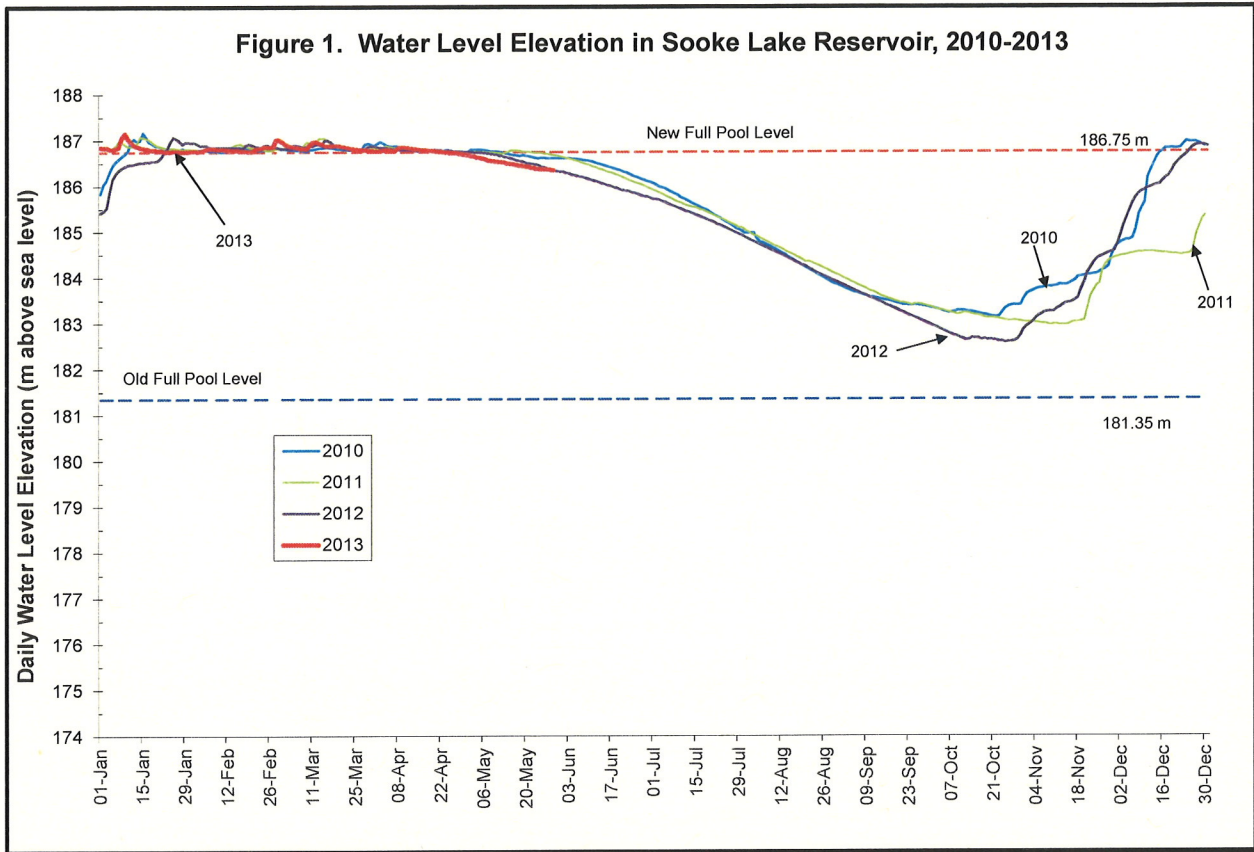
Stewart Irwin, M.Sc.
Senior Manager
Water Quality Division
Parks & Environmental Services

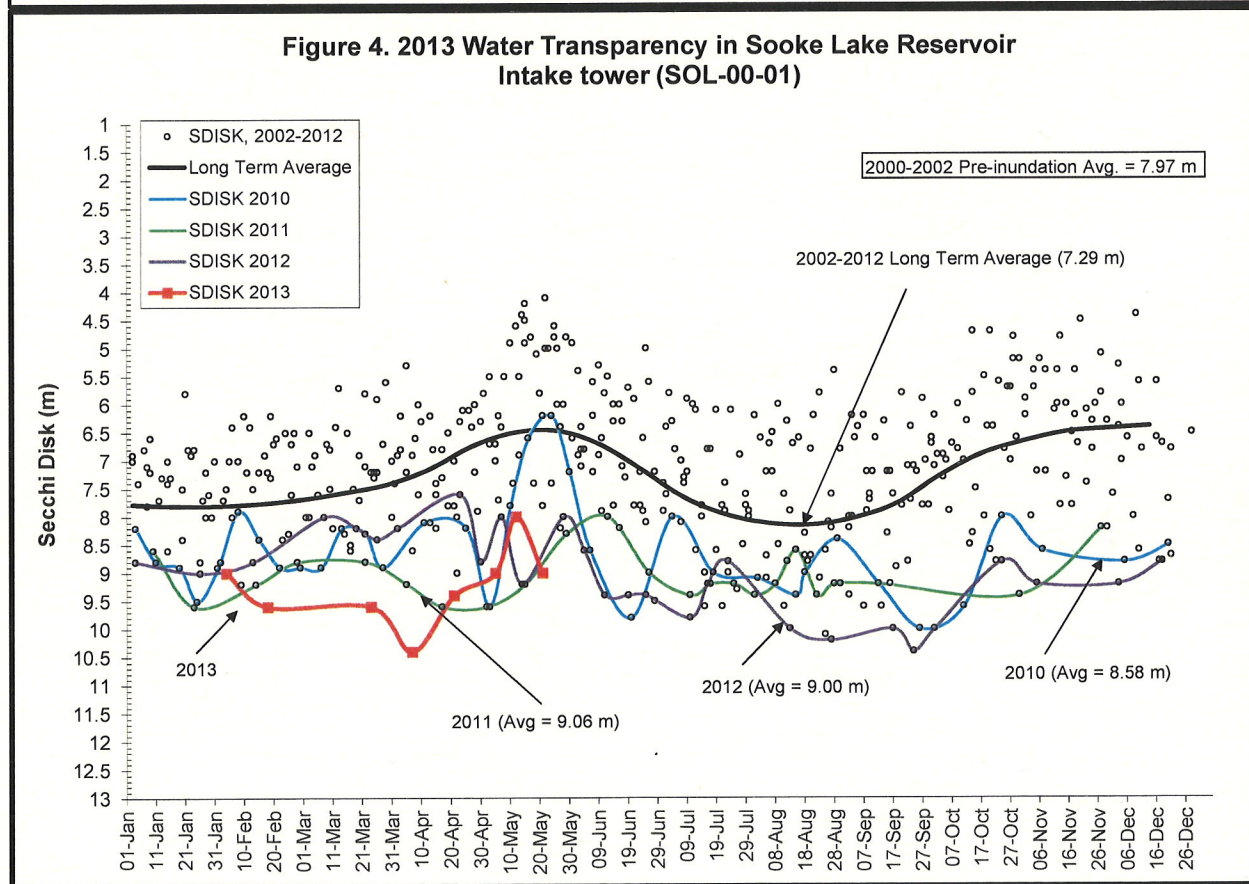
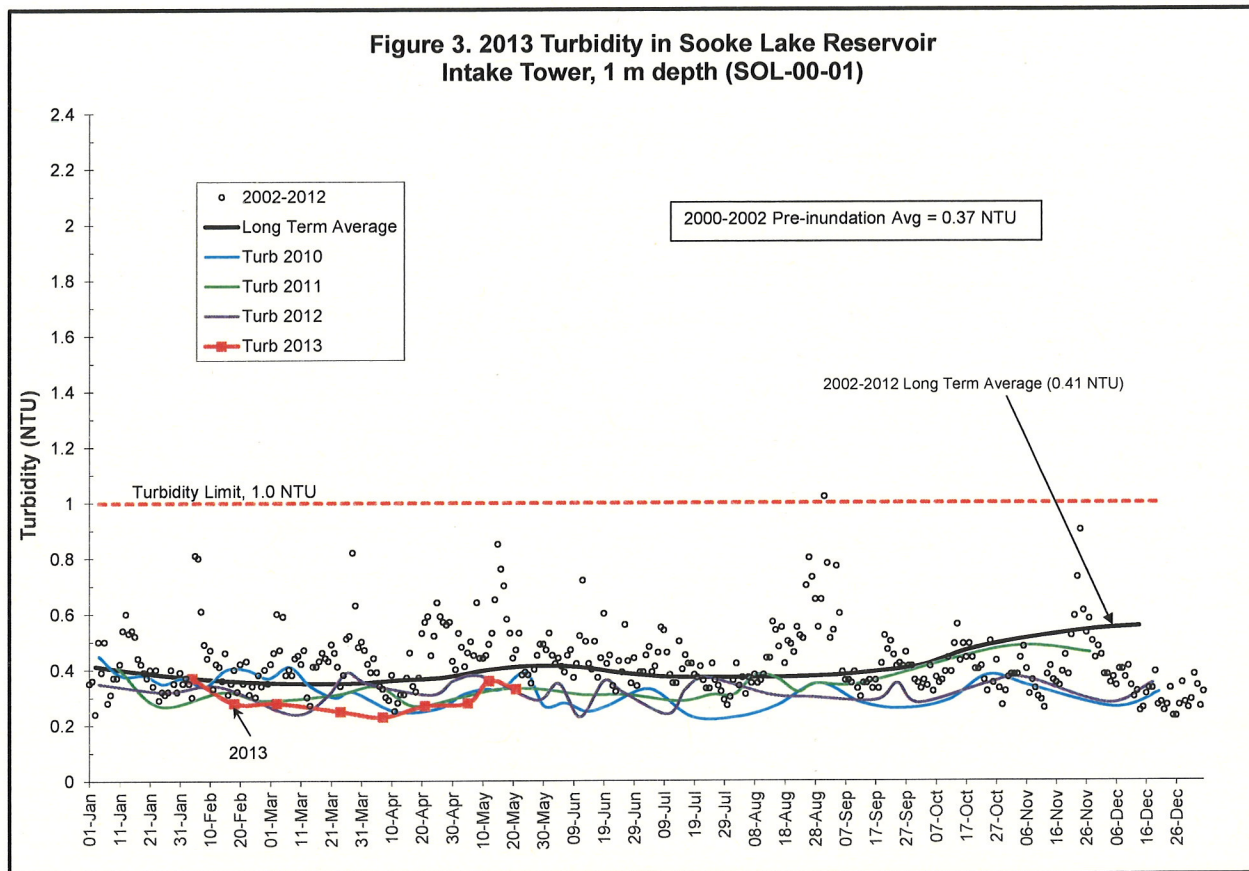


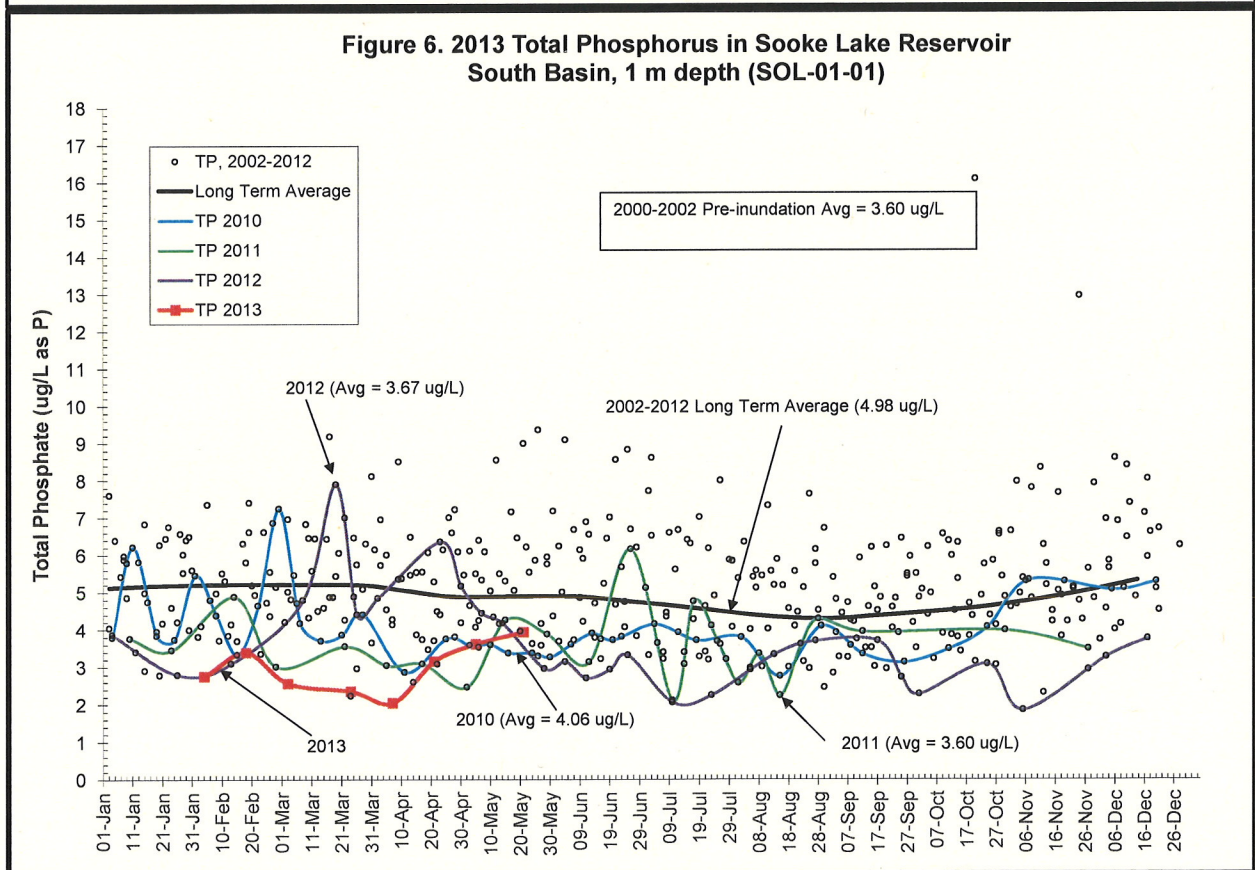
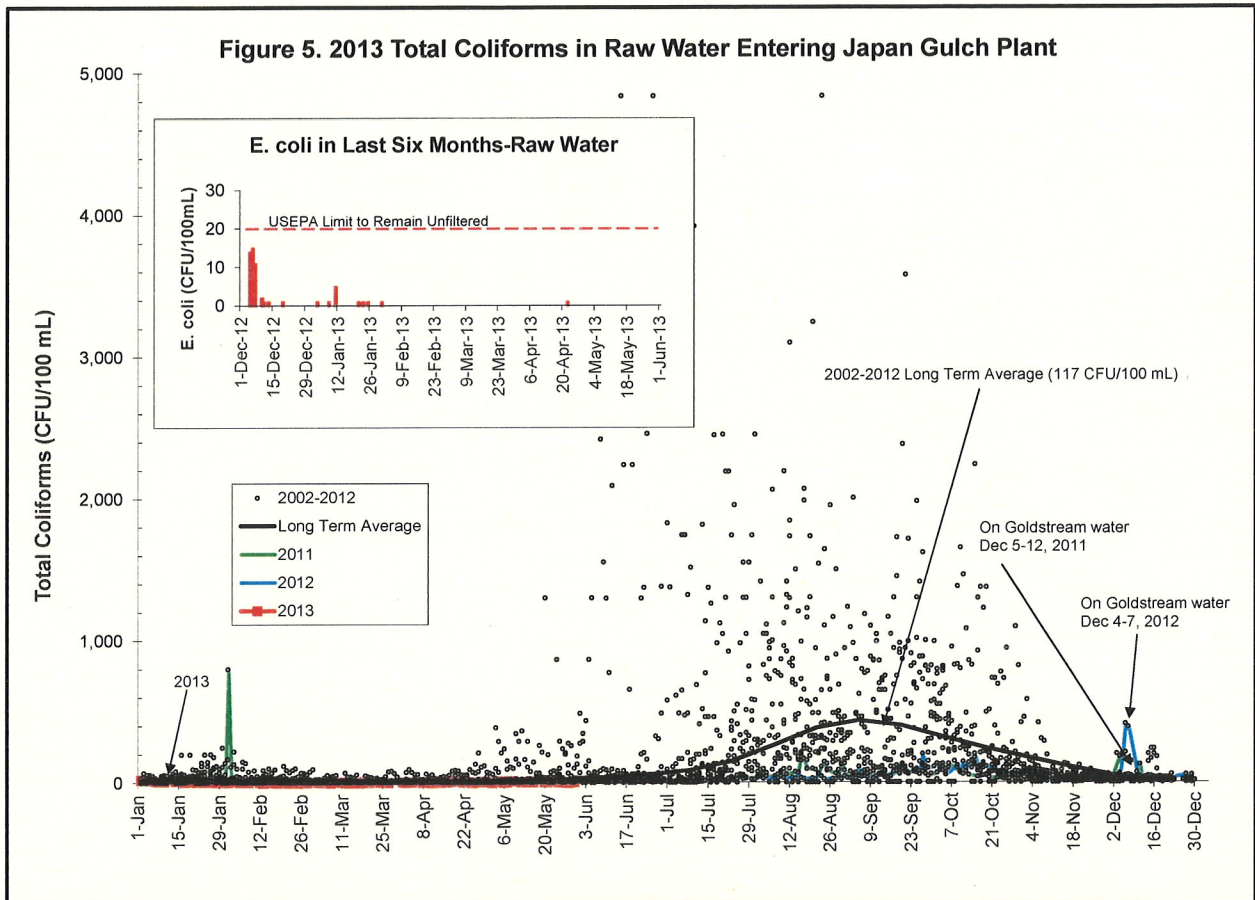
Larisa Hutcheson, P. Eng.
General Manager
Parks & Environmental Services
Concurrence

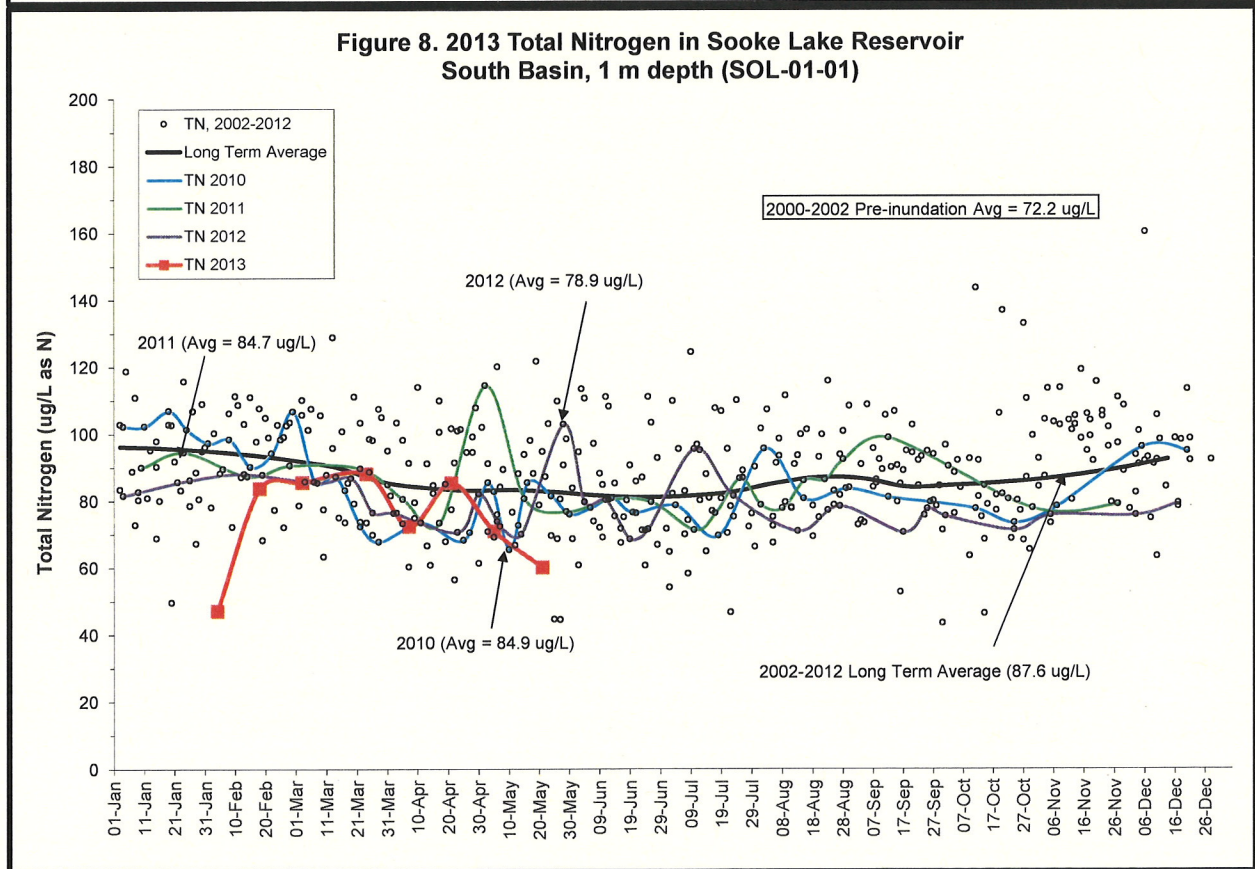
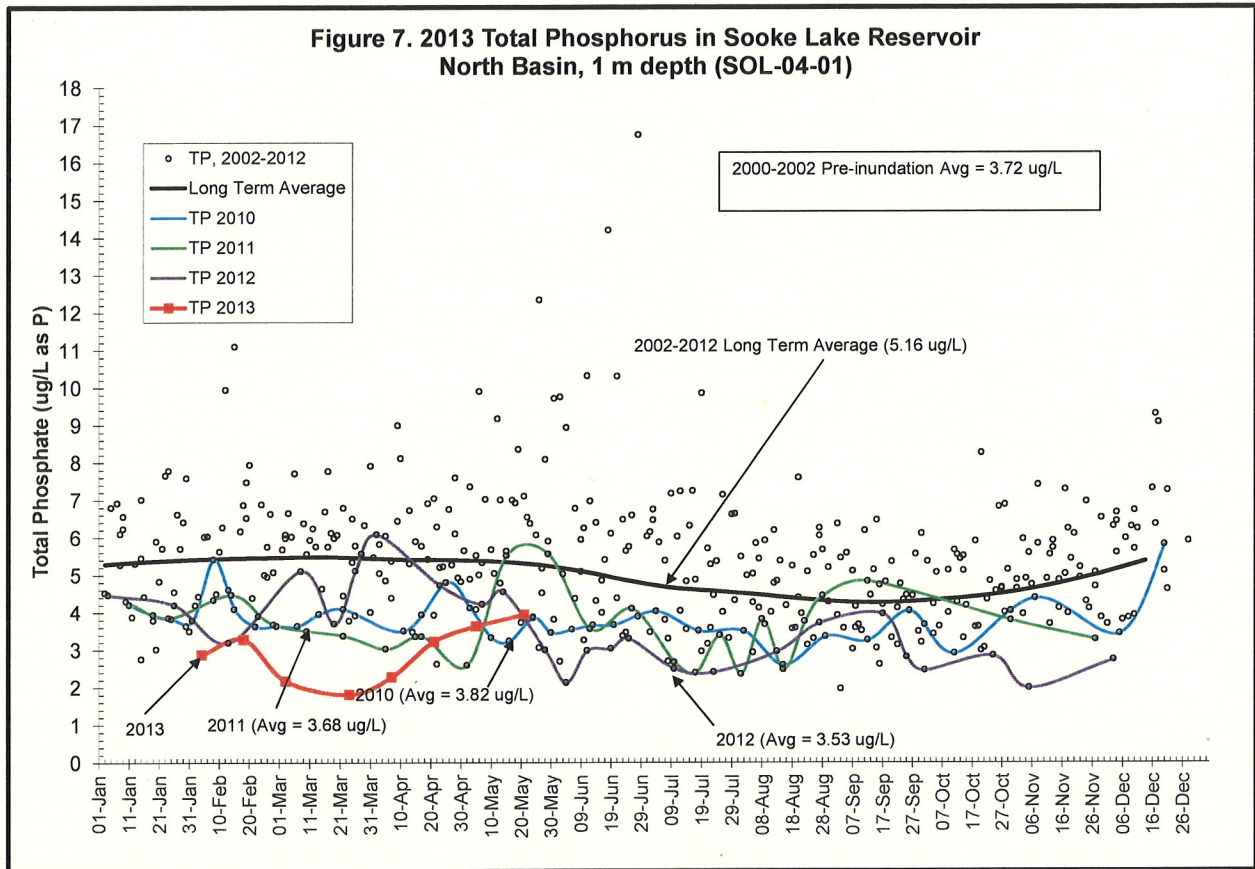


Ted Robbins, B.Sc., C. Tech.
General Manager, Integrated Water Services
Concurrence









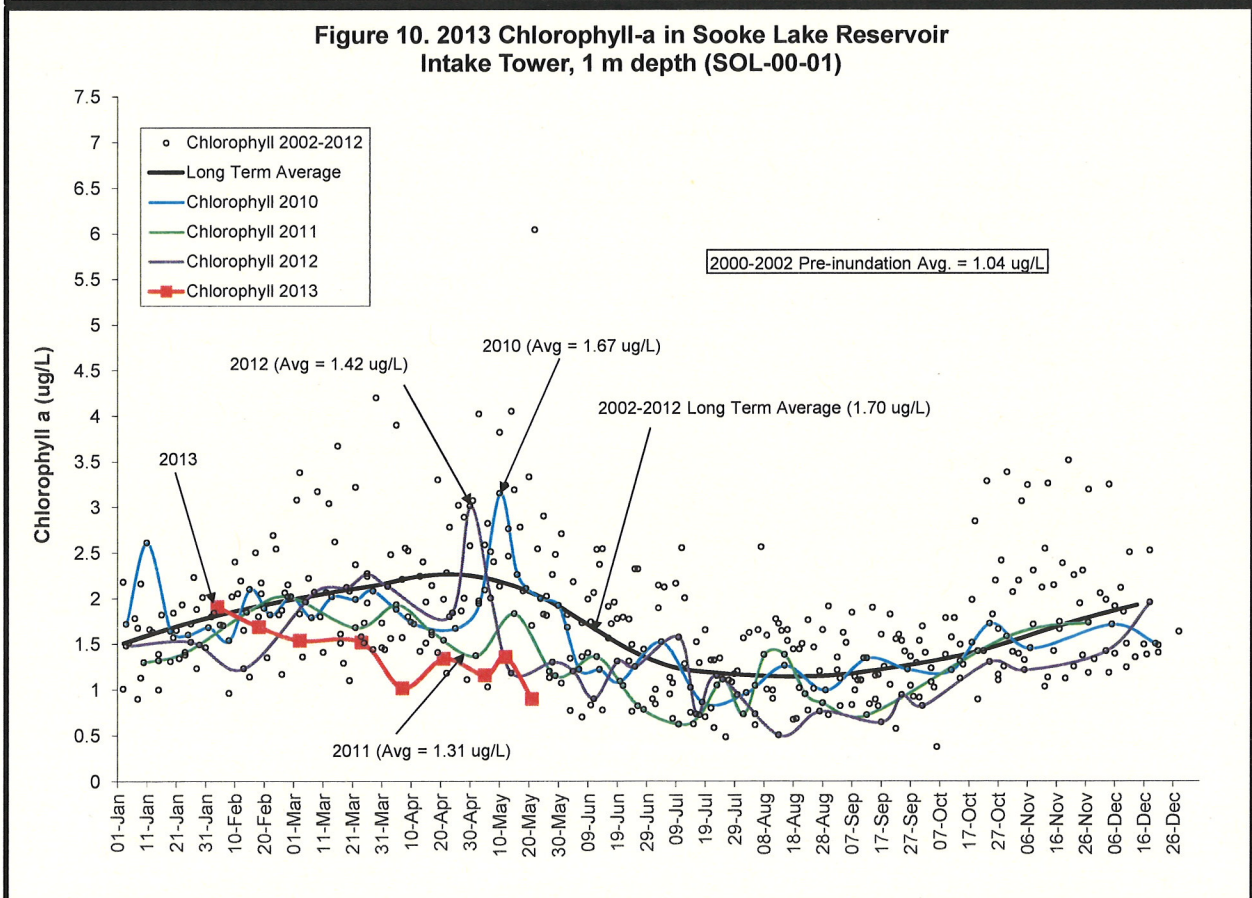
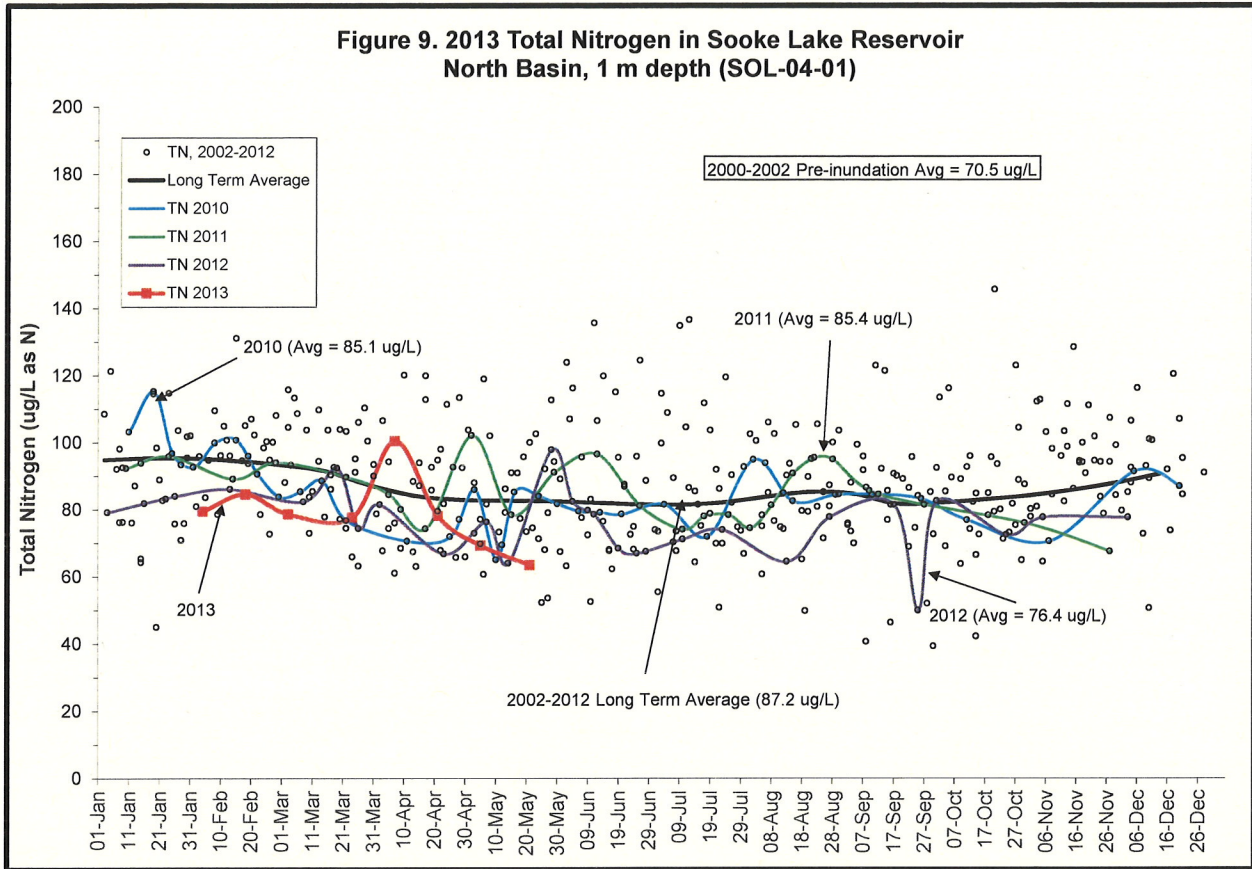


Figure 11. 2013 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 5 m depth (SOL-00-05)

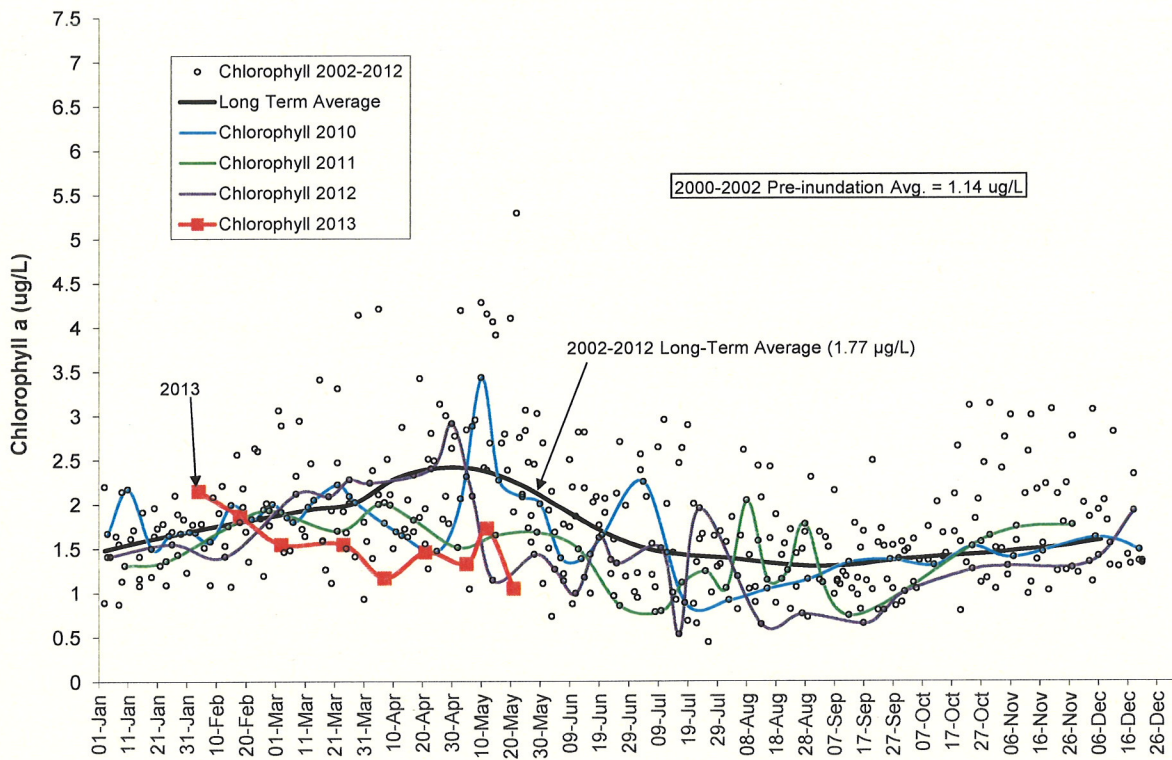


Figure 12. 2012 Chlorophyll-a in Sooke Lake Reservoir Intake Tower, 10 m depth (SOL-00-10)

