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Agenda Item #12  
REPORT #RWSC 2008-10

**REPORT TO REGIONAL WATER SUPPLY COMMISSION  
MEETING OF WEDNESDAY, 21 MAY 2008**

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SUBJECT WATER QUALITY TRENDS IN SOOKE RESERVOIR IN FEBRUARY TO APRIL 2008

SUMMARY

The water quality tests conducted for Sooke Reservoir during the period of February to April 2008 continued to show good quality source water.

PURPOSE

This report provides information on the water quality conditions observed in Sooke Reservoir during the months of February through April 2008 and compares these data with those from previous years and long-term averages.

**Physical Parameters**

*Water Levels.* From early February until April 15, 2008, Sooke Reservoir continued to spill (**Figure 1**). By the end of April the water level was about 0.1 m below full pool (186.66 metres).

*Water Temperature.* During February and March, the weekly average temperature of the water entering the Japan Gulch Treatment Plant hovered at the pre-inundation average (**Figure 2**). However, during April the weekly average water temperature of the water entering the Japan Gulch Plant fell below the pre-inundation average by more than a degree, averaging only 7.0°C versus 8.5°C for the long-term pre-inundation average. This drop in water temperature was due to colder than average temperatures in April and not due to the raising of the water level in the reservoir.

**Water Clarity**

*Turbidity.* During February through April 2008 the turbidity of the water in Sooke Reservoir averaged 0.35 NTU which is consistent with the post-inundation average during that same time period (**Figure 3**).

*Water Transparency.* In February through April 2008, the transparency of the water at the intake tower was better than the post-inundation average and for the most part was also better than the pre-inundation average (**Figure 4**). The better than average transparency may have been due to the relatively low biological activity that was occurring in Sooke Reservoir for some of that time period.

**Bacteria**

*Total Coliform Bacteria.* The total coliform bacteria concentration in the water entering the Japan Gulch Treatment Plant from Sooke Reservoir was similar, albeit slightly lower than levels observed in past years and similar to winter conditions of low coliform counts. By the end of April, the total coliform level was about 9 colony forming units per 100 mL. This is a very low number and indicates good bacterial quality.

**Nutrients**

*Phosphorus.* During February, the total phosphorus concentrations continued to average about 50% higher than the pre-inundation average in the south basin (**Figure 5**) and in the north basin (**Figure 6**). However, during March and April, the phosphorus concentration declined in both basins and, by the end of April, was approaching the pre-inundation average. (**Note:** In the charts, the bars on each data point indicate the range of data observed from triplicate samples.)

*Nitrogen* In February, the total nitrogen levels were about 50% higher than the long-term pre-inundation average in the south basin (**Figure 7**) and north basins (**Figure 8**) of Sooke Reservoir. In March and April, the total nitrogen levels showed substantial variation without any significant trend appearing.

### **Chlorophyll-a**

In February and March, chlorophyll-a concentrations continued to remain at relatively low levels throughout Sooke Reservoir (**Figure 9, intake tower**) (**Figure 10, north basin**). This low level is typical of winter conditions when algal activity is low. However, in April, chlorophyll-a concentrations started to rise slowly throughout the reservoir but remained at levels lower than the long-term post-inundation average.

### **Algae**

In February and March, several species of Diatoms started to increase in concentration. A short mini-bloom of the Diatom *Tabellaria fenestrata* occurred at the end of March and again at the end of April as well as a short mini-bloom of another Diatom, *Asterionella formaosa*, toward the end of April. Both of these Diatom species can clog home filtration devices and can impart a fishy or oily odour on the water. However, due to the short duration and relatively low concentrations in these mini-blooms, there were no significant increases in customer complaints in either fishy odours or filter-clogging over this period of time.

Zooplankton concentrations remained low to average and did not present a filter clogging problem.

### **Inundation Scientific Advisory Working Group**

The Sooke Reservoir Inundation Scientific Advisory Working Group met on February 7, 2008. No concerns were voiced. Since there were no unusual events during March or April, the Advisory Working Group meetings were cancelled for both months.

### **RECOMMENDATION**

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

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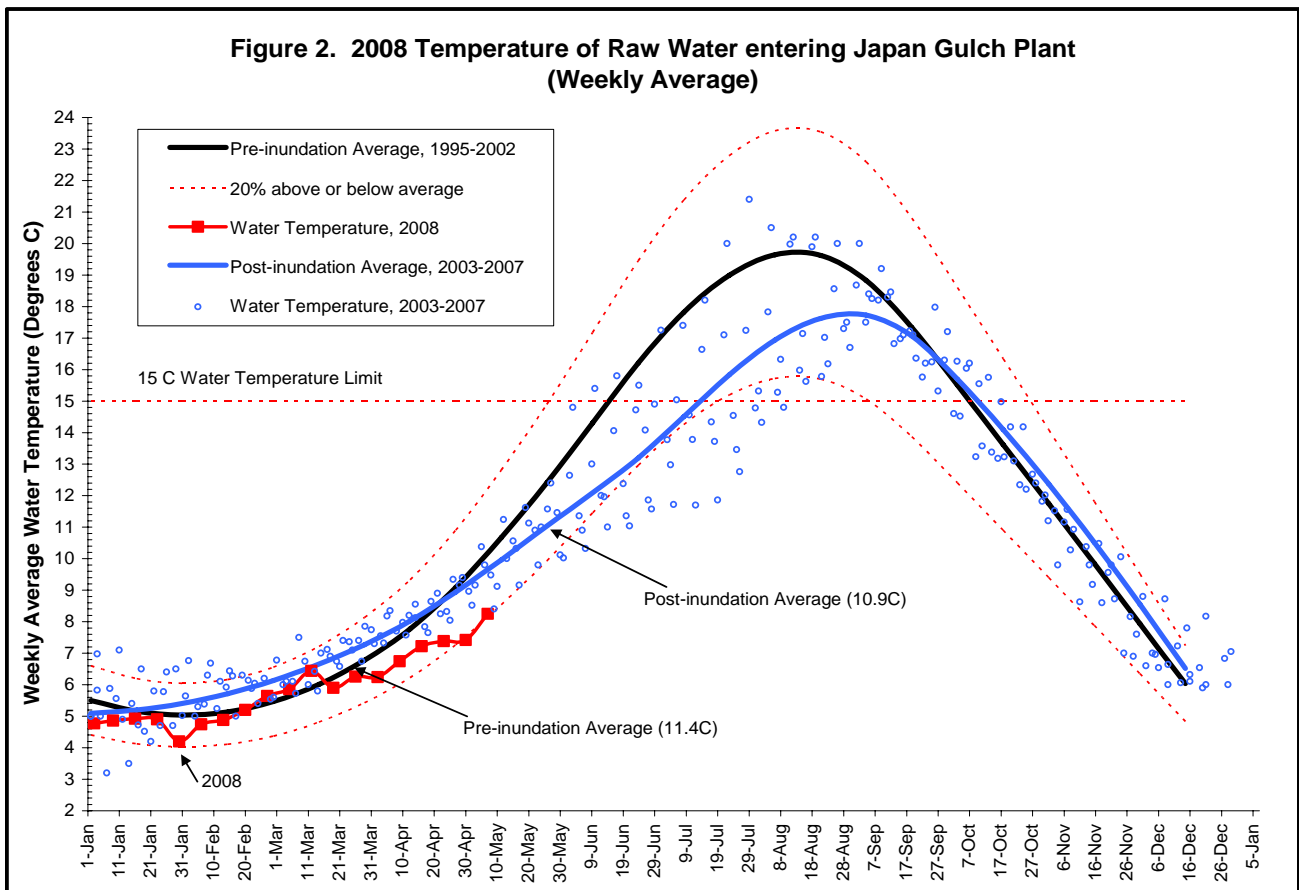
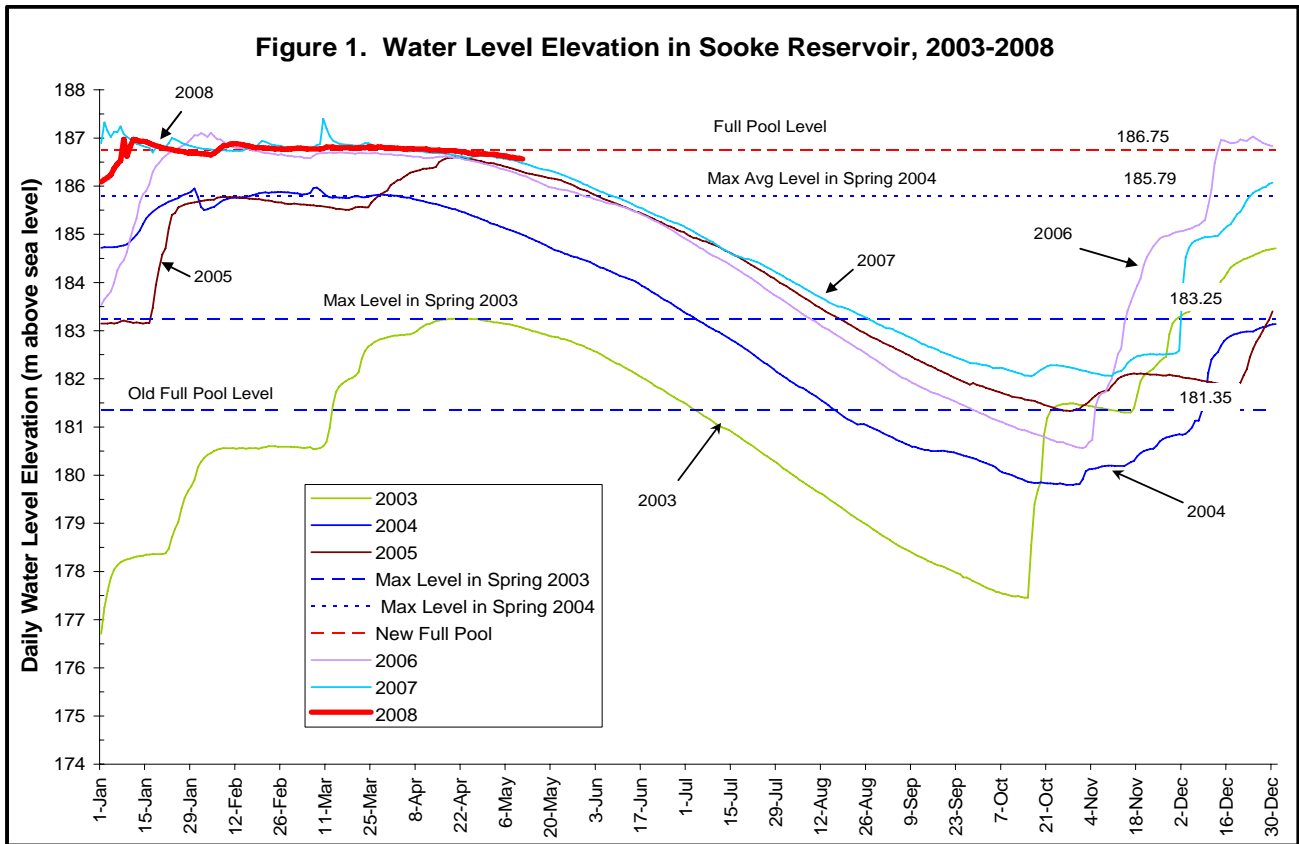
Maria Roxborough  
Laboratory Manager, Water Quality

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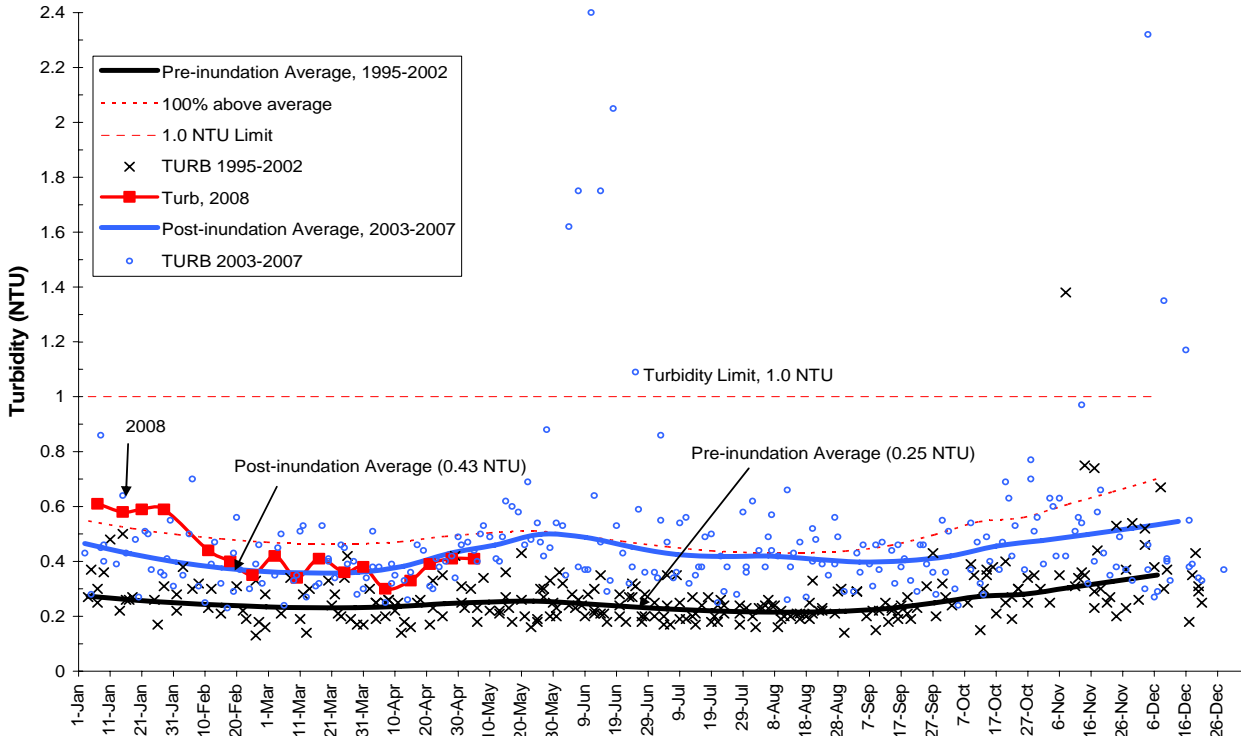
J. A. (Jack) Hull, MBA, P. Eng.  
General Manager, Water Services

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Stewart Irwin  
Senior Manager, Water Quality



**Figure 3. 2008 Turbidity in Sooke Reservoir  
 North Basin, 1m depth (SOL-04-01)**



**Figure 4. 2008 Water Transparency in Sooke Reservoir  
 Intake tower, (SOL-00-01)**

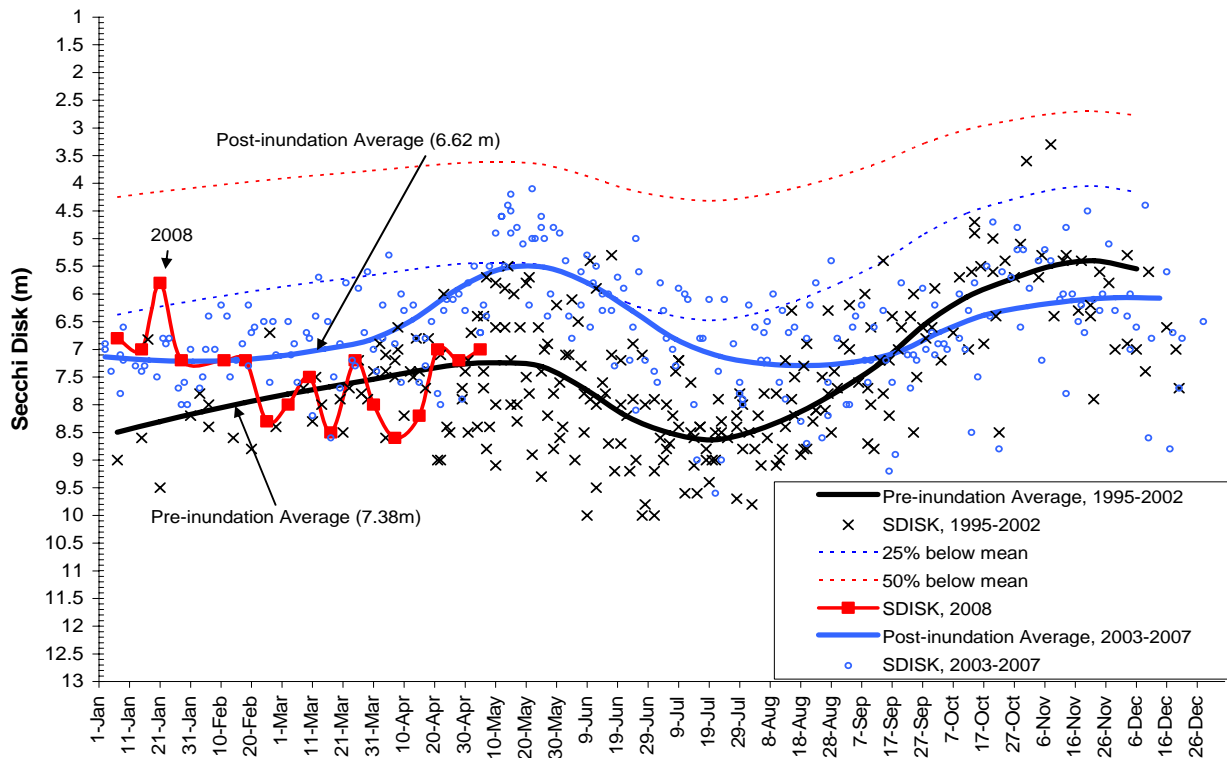


Figure 5. 2008 Total Phosphorus for Sooke Reservoir South basin, 1 m depth (SOL-01-01)

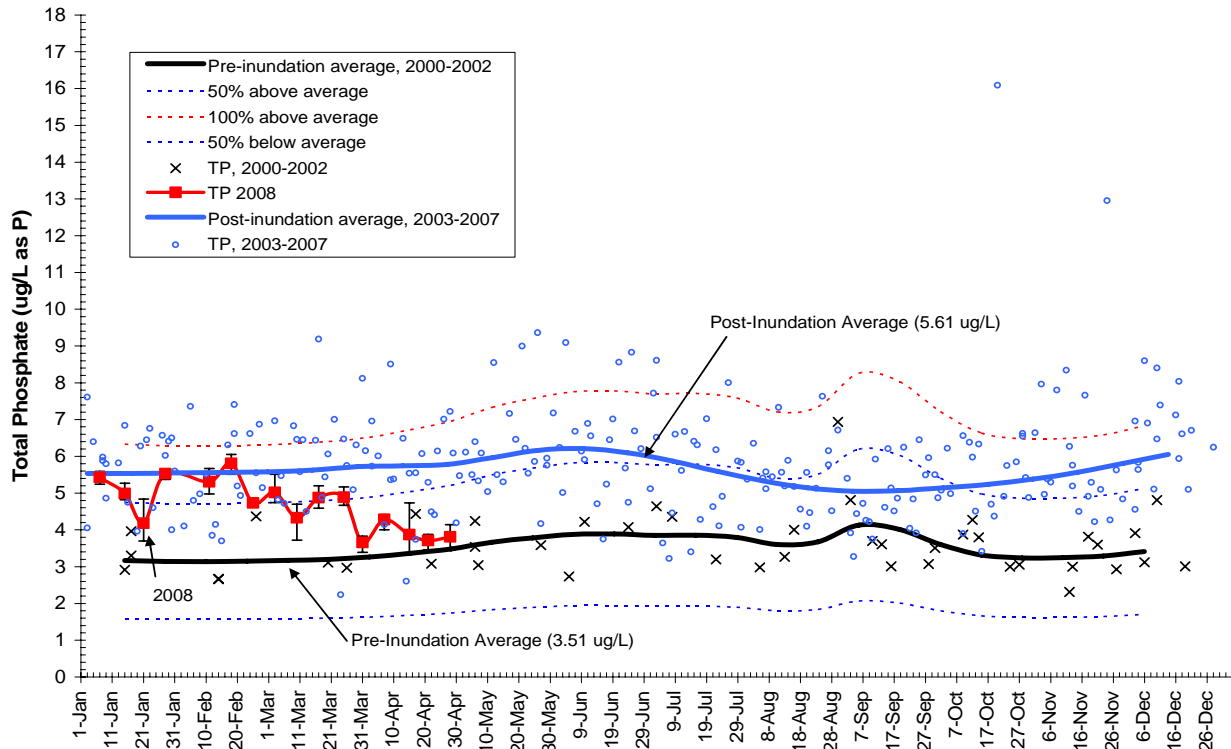


Figure 6. 2008 Total Phosphorus for Sooke Reservoir North basin, 1m depth (SOL-04-01)

