



REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, 17 JANUARY 2007

SUBJECT WATER QUALITY TRENDS IN SOOKE LAKE RESERVOIR IN DECEMBER 2006

SUMMARY

The various water quality parameters measured in Sooke Reservoir during December, 2006 showed good source quality of water. Sooke Reservoir spilled on December 14, 2006 and is now entering the second year that the soil in its reservoir margin has been fully inundated.

PURPOSE

This report provides information on the water quality conditions observed in Sooke Reservoir during the month of December 2006 and compares those data with previous years and long-term averages.

REPORT

Physical Parameters

Water Levels. During the month of December, the water level in Sooke Reservoir increased by 1.8 metres (**Figure 1**). The reservoir reached full pool in mid December and started to spill on December 14th. By month end, Sooke Reservoir had spilled 12.5 billion litres (2.7 billion gallons). It is anticipated that the early spill of Sooke Reservoir should be beneficial as it should flush the reservoir of some of its nutrients.

Water Temperature. During December, the weekly average temperature of the water entering the Japan Gulch Plant declined by about 1°C (**Figure 2**). By month end, the weekly temperature of the water entering the Japan Gulch Plant was about 6°C.

Water Clarity

Turbidity. During the month of December, the turbidity (cloudiness) of the surface water in Sooke Reservoir remained relatively low (approx 0.4 NTU) (**Figure 3**) and was lower than the long-term average. The water entering the system continued to be well below the turbidity limit listed for drinking water in the *Guidelines for Canadian Drinking Water Quality*. The low turbidity results were quite interesting given the number of storms and the influx of water coming into Sooke Reservoir during November and December. The low turbidity continued to demonstrate the stability of this reservoir against changes in turbidity.

Water Transparency. The transparency of the water (as measured by observing a black and white disk under the water) in all basins of Sooke Reservoir remained relatively good during the month of December and continued to be substantively better than the long-term, pre-inundation average at the Intake Tower (**Figure 4**).

Bacteria

The total coliform bacteria concentration in the water entering the Japan Gulch Plant from Sooke Reservoir remained low throughout December. By month end, the total coliform level was only about 30 colony forming units per 100 mL. This was similar to previous years and typical of cold water winter conditions.

Nutrients

Phosphorus. During the stormy weather in November and December, the total phosphorus concentrations in both the south (**Figure 5**) and north basins (**Figure 6**) of Sooke Reservoir increased and were approximately 50% higher than the long-term, pre-inundation average. (**Note:** In the charts, the bars on each data point indicate the range of data observed from triplicate samples.)

Nitrogen. Total nitrogen levels in December continued the trend of remaining slightly higher than the long-term, pre-inundation average in both the south (**Figure 7**) and north basins (**Figure 8**) of Sooke Reservoir.

Chlorophyll-a

In December, chlorophyll-a concentrations (a general measure of algal populations) at the Intake Tower (**Figure 9**) and the north basin (**Figure 10**) in Sooke Reservoir continued to decline and reached pre-inundation levels, typical of the winter season.

Algae

In December, algal populations in Sooke Reservoir continued the decline from mid-September when the diatom *Asterionella* bloomed. By the end of December, both the relatively low concentrations and healthy diversity of algal species indicated the start of lower winter algal populations.

Inundation Scientific Advisory Working Group

The Sooke Reservoir Inundation Scientific Advisory Working Group did not meet in December as little biological activity was occurring in Sooke Reservoir. The next scheduled meeting is in February 2007.

RECOMMENDATION

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

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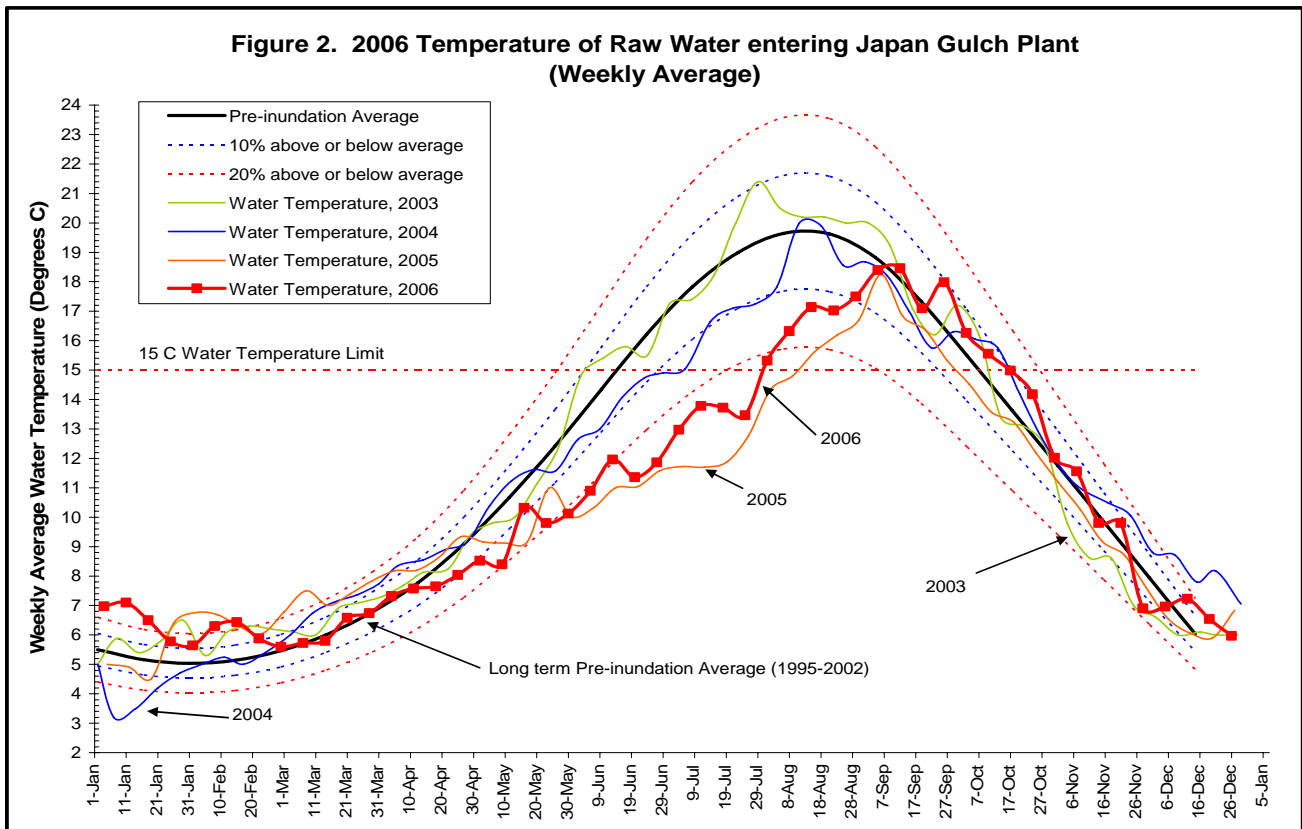
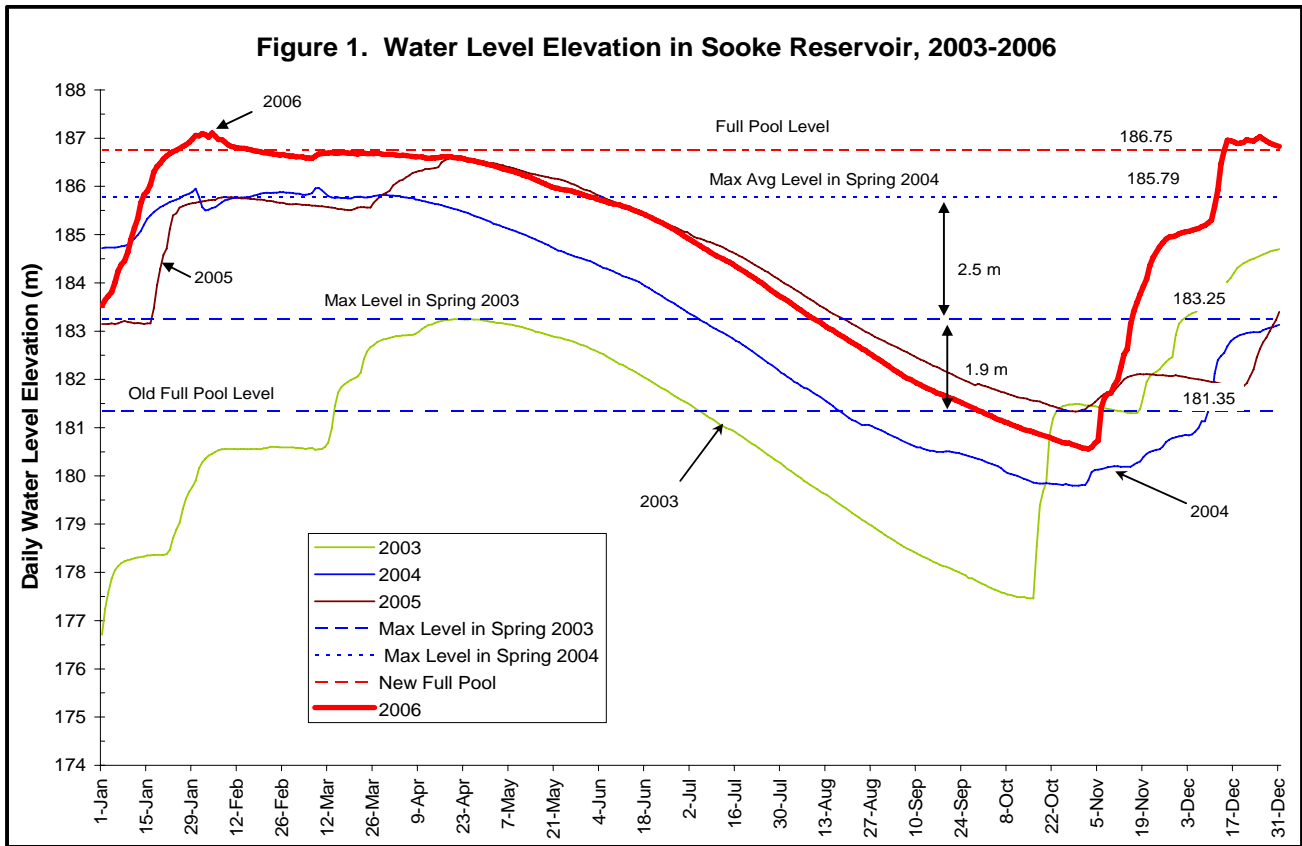


Figure 3. 2006 Turbidity in Sooke Reservoir Intake Tower, 1m depth (SOL-00-01)

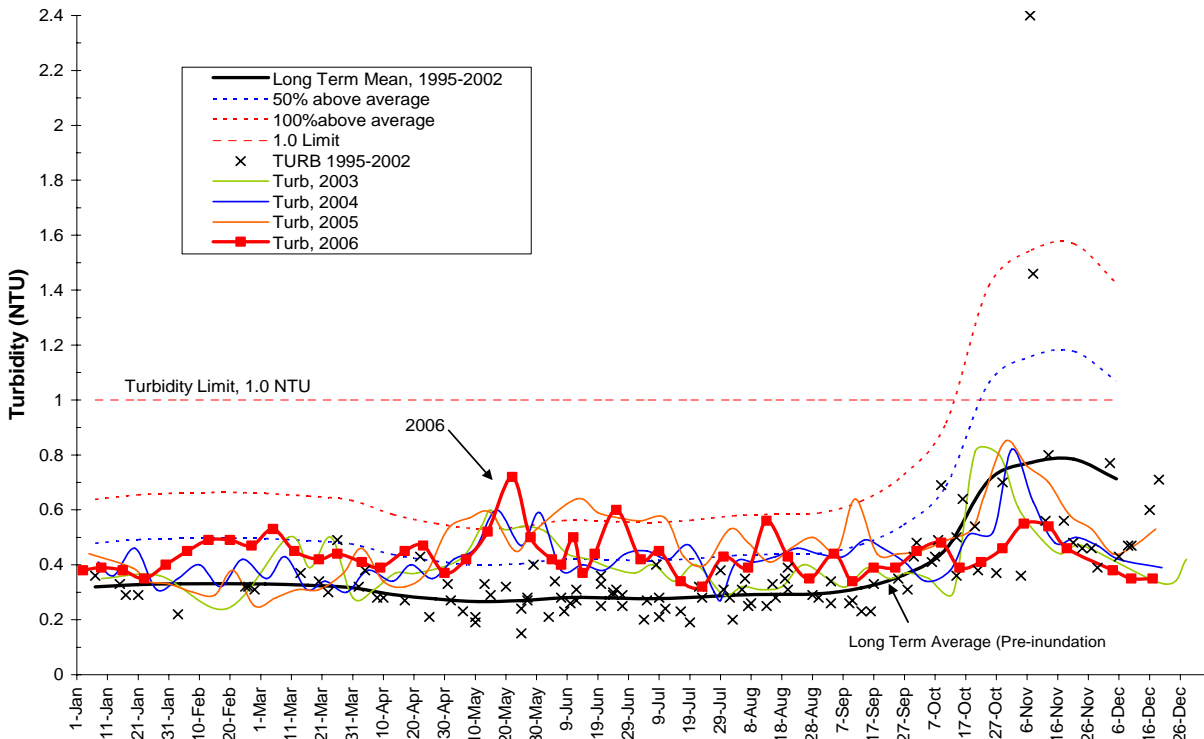


Figure 4. 2006 Water Transparency in Sooke Reservoir Intake tower, (SOL-00-01)

