

The Cooperative Chemical Analytical Laboratory (CCAL) analyzes naturally occurring freshwaters for trace level nutrients. As a customer of CCAL you are being sent this notice to inform you of a change in our analytical instrumentation.

The laboratory has replaced the auto-titrator that has been used for the last 3 years to analyze alkalinity and pH with a newer model. Samples submitted to the laboratory will now be analyzed using the ManSci PCT auto-titrator. We have discontinued using the Radiometer TIM840 auto-titrator at this time. The primary reason for changing to the new instrument is functional hardware problems with the old instrument. The changeover date for the new instrument is 31 August 2011.

Numerous projects have submitted samples to the laboratory for many years creating long-term databases for alkalinity and pH. For these long-term databases it is important to be able to correlate results and develop a relationship between the old instrument and the new instrument. The following is a brief discussion of how the two instruments compare.

The pH probe for the new instrument is a combination reference/sample probe similar to the type used with the instrument being replaced. 58 samples were analyzed for pH using both instruments and the results compared to evaluate any difference between the instruments. pH measured between 4.9 - 8.8 pH units. The range of operation for both instruments is 0 - 14 pH units with a precision of +/- 0.1 pH units.

Comparison between the two instruments for pH shows a slight difference with the new instrument measuring pH values about 0.1 pH lower than the old instrument. This is true throughout the entire range of pH measured. The difference in pH measurement between the two instruments is within the historic level of variability (precision) reported for the determination. However, projects with long-term data may notice a slight shift with results reported from the new instrument.

The new instrument has been configured to use the same process as the old instrument of titrating to a fixed endpoint (pH 4.5) to determine total alkalinity. 58 samples were analyzed for alkalinity using both instruments and the results compared to evaluate any difference between the instruments. Sample concentrations ranged from 1.21 - 195.15 mg/l alkalinity as calcium carbonate (CaCO₃). Detection level for both instruments is 0.20 mg/l with precision of +/- 0.20 mg/l.

Examination of comparison results for total alkalinity indicates a bias for sample concentrations up to approximately 50 mg/l CaCO₃ with the new instrument generally producing higher results than the old instrument. Comparing the magnitude of difference between results for the two instruments does not indicate a simple relationship based on concentration but does indicate a relationship for some sampling locations. For comparison samples with total alkalinity greater than 50 mg/l the difference between results for the two instruments ranged from 0.33 mg/l - 20.56 mg/l. The new instrument produces lower results

than the old instrument at the higher total alkalinity range. This indicates that for samples with total alkalinity greater than 50 mg/l CaCO₃ that there may be significant variance with historic results. The magnitude of difference appears to be dependent on sample matrix.

Please let me know if you have any questions about any of this information or if you have concerns as to how this change in method might affect your database. Thank you.

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