

*Lake of the Woods*  
**KENORA**



# **BLACK STURGEON LAKES WATER QUALITY MONITORING**

**2025 REPORT**

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Planner**

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## **1.0 BACKGROUND**

In the fall of 2007, the City of Kenora was presented with the results of the *Lake Capacity and Management Study for Black Sturgeon Lake*. One of the recommendations of this study was to conduct ongoing water quality assessments on Lower Black Sturgeon Lake to monitor changes to the water quality in the lake.

In 2009 and 2010, the City of Kenora awarded the contract to conduct the baseline data work for the first two years of water quality monitoring on Black Sturgeon Lakes to Ryan Haines Consulting. From 2015 to 2022, the water quality assessment contract was awarded annually to Kenora Resource Consultants Inc. (note – Ryan Haines Consulting was incorporated into Kenora Resource Consultants Inc. in 2012). In June of 2024, Ryan Haines was hired by the City of Kenora as a Planner and, subsequently, the 2024 and 2025 Black Sturgeon Water Quality Assessments were conducted in-house with technical support from the Grand Council Treaty #3 Territorial Planning Unit.

For 2025, the program was streamlined by reducing the number of active sampling sites from three to two, in addition to focusing on the parameters that have shown variability over the past 15 years of sampling (phosphorous, chloride, dissolved organic carbon, and total ammonia). This has resulted in:

- Cost savings by focusing resources on the most representative sites (inlet and outlet of Lower Black Sturgeon Lake) and parameters of interest.
- Maintained scientific validity, as the two chosen sites capture nutrient inputs and outputs for the lake system.

## **2.0 METHODOLOGY**

Two sampling sessions were conducted during the 2025 season, a spring session on May 16<sup>th</sup> and a late summer session on September 4<sup>th</sup>. Water samples were taken at two locations on Lower Black Sturgeon Lake during each sampling session. Sample locations correspond to sites identified in the *Lake Capacity and Management Study for Black Sturgeon Lake*.

The selection of the site locations has been designed to determine the impacts of development on the water quality of Black Sturgeon Lakes. Site 2 is located at the outlet of Black Sturgeon Lakes into the Winnipeg River and Site 3 is located at the inlet of Black Sturgeon Creek into Lower Black Sturgeon Lake (Figure 1). Site 2 is the main sampling location used to assess the impacts of development on water quality because the new and proposed developments on Lower Black Sturgeon Lake are occurring upstream of this site.

All fieldwork was conducted from a small motorboat with a sonar unit mounted to the stern. At each sampling site, an anchor was used to keep the boat in one location.

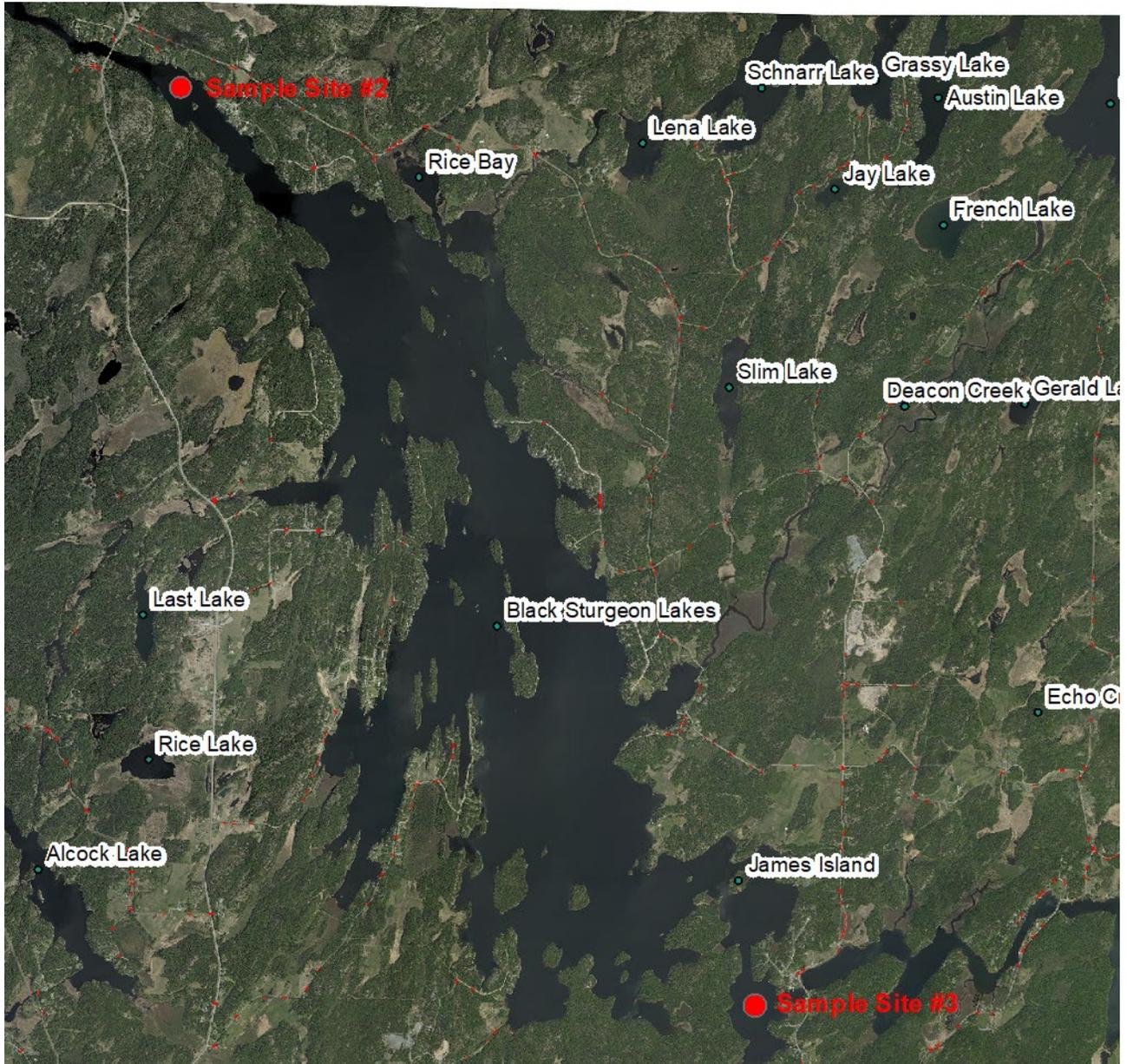


Figure 1 – Sampling Sites for Water Quality Monitoring on Black Sturgeon Lakes

## 2.1 Spring Sampling

During the spring sampling session, the focus was on the euphotic zone (surface water) sampling to capture spring turnover or mixing of the lake. The spring fieldwork consisted of recording Secchi depths and collecting euphotic zone composite water samples.

Secchi depth was determined at each site by lowering a Secchi disk (20-cm disk with alternating black and white quadrants) over the shaded side of the boat. The disk was lowered until the observer could no longer distinguish between the white and black quadrants and then raised until the disk came back into view. This was repeated three times and then the depths at which the disk disappeared and then reappeared were averaged to give the Secchi depth.

The euphotic zone is the section of the water column where enough light penetrates to facilitate algae growth (measured as 2X the Secchi depth). In order to obtain a water sample containing water from the euphotic zone, a weighted, 500 mL, small neck bottle was lowered with a rope in the water column to a depth of 2X Secchi depth then quickly brought to the surface. The euphotic composite water was then transferred to the sample bottle provided by the laboratory for shipping (Figure 2).



Figure 2 – Transferring water sample from euphotic zone composite into lab sample bottle

## 2.2 Late Summer Sampling

Late summer sampling included all of the fieldwork conducted during the spring (Secchi depths and euphotic zone composite water sampling), but with the addition of temperature/oxygen profiles and bottom water column samples to measure the impacts of the summer thermal stratification and oxygen depletion on water quality.

Temperature/oxygen profiles were obtained during the late summer sampling session using a YSI Multi-parameter Meter.

During the later summer sampling session, an additional water sample was taken approximately one meter from the bottom of the lake using a Beta horizontal water sampler (Figure 3). Both ends of the water sampler were opened prior to lowering it (using a rope) to the desired water depth. At the desired depth, a small weight (messenger) was sent down through the water column along the length of the rope triggering a release mechanism on the sampler and causing the sampler caps to close.

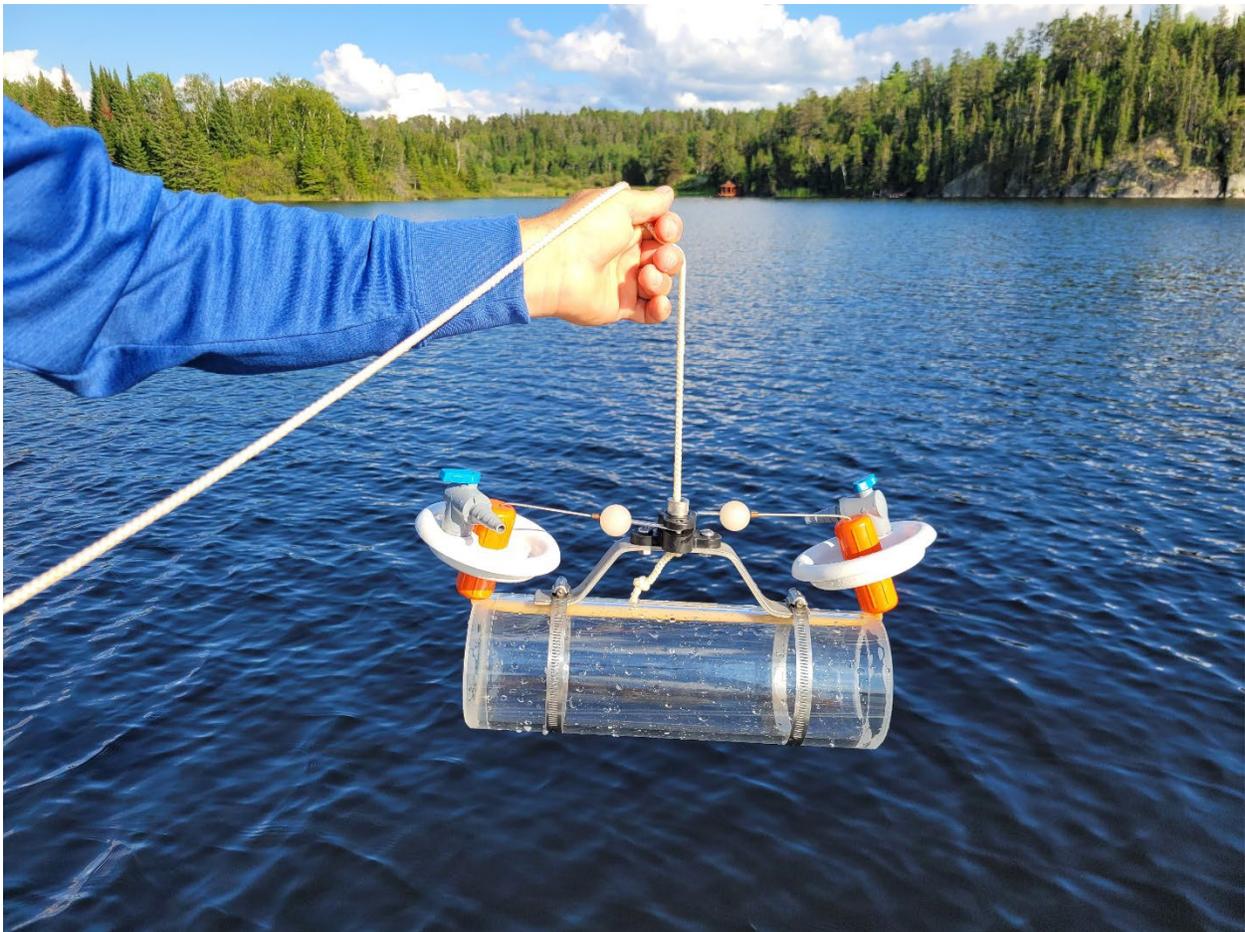


Figure 3 – Horizontal Beta Sampler prior to deployment

All water samples collected were transferred immediately upon collection to sample bottles for analysis at a laboratory. Samples were delivered by vehicle to the ALS Laboratory Group in Winnipeg, MB, for analyses.

### 3.0 RESULTS

#### 3.1 Sampling Session Dates and Locations

The 2025 sampling sessions were conducted on May 16<sup>th</sup> and September 4<sup>th</sup>, 2025.

#### 3.2 Total Phosphorous

During 2025, the spring turnover euphotic zone phosphorous concentrations taken at Site 2 (0.0130 mg/L) and Site 3 (0.0139 mg/L) were below the provincial water quality objective (PWQO) of 0.0200 mg/L (Figure 4).

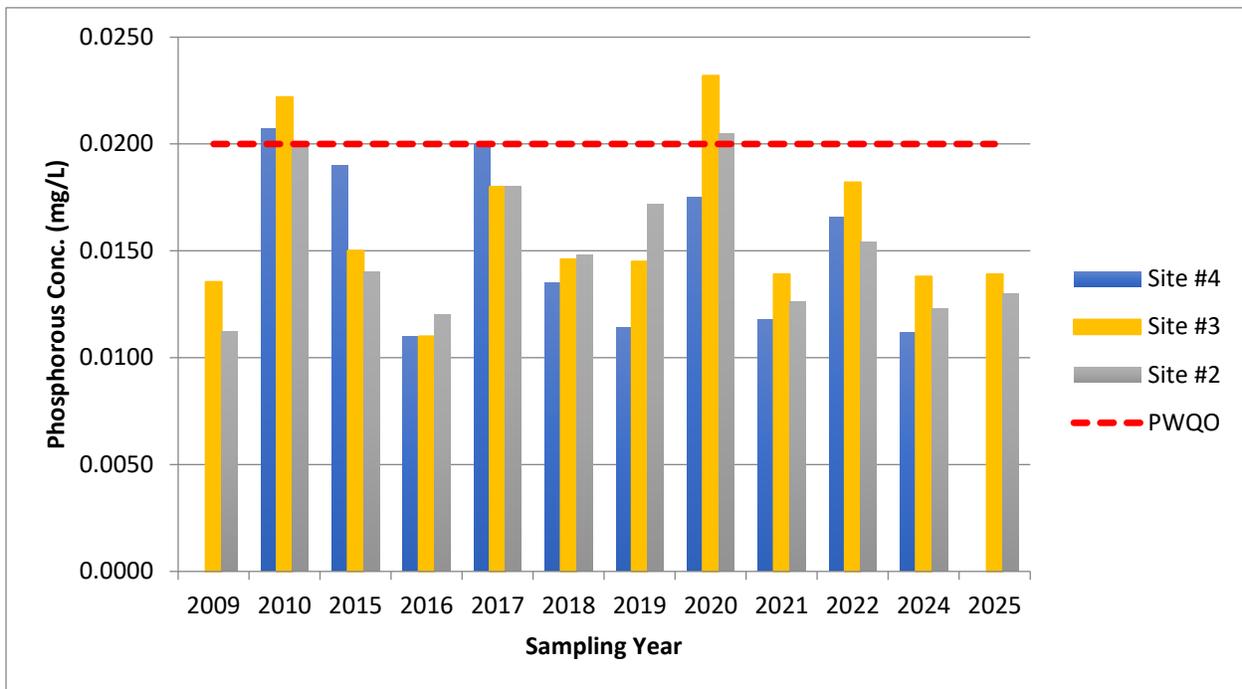


Figure 4 – Spring Turnover Total Phosphorous Concentrations for Sampling Sites on Black Sturgeon Lakes from 2009 to 2025.

#### 3.3 Chemical Analyses - Water Quality Characteristics

The spring turnover water samples were analyzed for the four parameters that have shown variability in the sampling conducted since 2010 (phosphorous, chloride, dissolved organic carbon, and total ammonia). The 2025 results for Site 2 (outlet of Black Sturgeon Lakes and downstream of new development activities) were comparable to the results for the previous 11 sampling seasons and were all within the provincial water quality objectives (PWQO) for the parameters where an objective is provided. The laboratory results can be found in Appendix 1.

#### **4.0 SUMMARY**

The phosphorous levels at Site #2 and Site #3 for 2025 are below the 0.02 mg/L provincial water quality objective (PWQO). This is the twelfth year of water sampling on Black Sturgeon Lakes and the phosphorous results have been below the PWQO for ten of these years, including the past four sampling seasons.

The 2025 sampling results for sites #2 and #3 for for the additional water quality parameters were all within the PWQO for the parameters where an objective is provided.

The results collected and analyzed as part of the Black Sturgeon Lakes water sampling program from 2009 to 2025 do not provide any indicators of negative impacts of development activities on water quality within Lower Black Sturgeon Lake.

## 5.0 REFERENCES

Gartner Lee Ltd. and Kelli Saunders Environmental Management. October 2007. *Lake Capacity and Management Study for Black Sturgeon Lake, City of Kenora.*

Ministry of the Environment. 2015a. Lake Partner Total Phosphorous Data. Found on website at: <http://desc.ca/programs/lpp>

Ministry of the Environment. 2015b. Lake Partner Secchi Depth Data. Found on website at: <http://desc.ca/programs/lpp>

Ministry of Environment and Energy. July 1994. *Water Management: Policies; Guidelines; Provincial Water Quality Objectives of the Ministry of Environment and Energy.* Found on website at: <http://www.ontario.ca/document/water-management-policies-guidelines-provincial-water-quality-objectives>

Riemersma, S., Little, J., Ontkean, G., and Moskal-Hébert, T. 2006. Phosphorus sources and sinks in watersheds: A review. 82 pp. In Alberta Soil Phosphorus Limits Project. Volume 5: Background information and reviews. Alberta Agriculture, Food and Rural Development, Lethbridge, Alberta, Canada

## APPENDIX 1 – 2025 LABORATORY RESULTS



**Analytical Results**

**Sub-Matrix: Surface Water**  
**(Matrix: Water)**

					Client sample ID	Site 2	Site 3	----	----	----
					Client sampling date / time	16-May-2025 00:00	16-May-2025 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	WP2506772-001	WP2506772-002	----	----	----	
					Result	Result	----	----	----	
<b>Sample Preparation</b>										
Dissolved carbon filtration location	----	EP358/WP	-	-	field	field	----	----	----	
<b>Anions and Nutrients</b>										
Ammonia, total (as N)	7664-41-7	E298/WP	0.0050	mg/L	<0.0050	<0.0050	----	----	----	
Chloride	16887-00-6	E235.Cl/WP	0.50	mg/L	4.27	5.81	----	----	----	
Phosphorus, total	7723-14-0	E372-U/WP	0.0020	mg/L	0.0130	0.0139	----	----	----	
<b>Organic / Inorganic Carbon</b>										
Carbon, dissolved organic [DOC]	----	E358-L/WP	0.50	mg/L	8.01	8.07	----	----	----	

Please refer to the General Comments section for an explanation of any qualifiers detected.