

1.2 Lake Wanapitei Subwatershed



General Description

- **Total area:** 358.83 km²
- **Drainage:** This subwatershed is located around Lake Wanapitei, which receives water from the East Wanapitei River and drains south through the Wanapitei River. North of the town of Falconbridge, groundwater is known to flow north, discharging into Lake Wanapitei.
- **Topography:** The average elevation is about 300 m.a.s.l. to the south and 350 m.a.s.l. to the north. It is characterized by a rugged terrain, with a maximum local topographic relief of approximately 90m.
- **Geology:** The origin of the Lake Wanapitei structure is speculated to have originated through meteorite impact.
 - **Bedrock Geology:** Precambrian bedrock of the Huronian province to the east and of the Superior province to the west.
 - **Quaternary Geology:** Mainly exposed or thinly covered bedrock. Intrusions of glaciofluvial outwash deposits at the inlet and outlet of the lake, made up of gravels and sands.
- **Soils:** Mostly covered by stable bedrock, with large areas of fine sandy loam along the north shore of the lake, where the East Wanapitei River discharges into the lake. An area of sand and gravelly sandy loam also underlays the areas surrounding the south-west bay of the lake.
- **Groundwater:**
 - The Source Protection Plan identified areas along the north shore of the lake (mostly within the provincial park), in the southwestern end, and peppered throughout the subwatershed, as Highly Vulnerable Aquifers (HVA).
 - This subwatershed also encompasses a large Significant Groundwater Recharge Area from Skead to the southern extent of the subwatershed.
- **Land cover:**
 - Forest covers an area of 174.6 km², 48.7 % of the subwatershed.
 - Lakes cover an area of 148.44 km², making up 41.4% of the subwatershed. Much of this area is comprised of Lake Wanapitei itself.
 - Wetlands cover an area of 28.86 km², 8.0% of the subwatershed.
- **Land Use Type**
 - **Zoning:** Because of its northern range, only half (56.6%) of this subwatershed is subject to the City of Greater Sudbury's Zoning By-law. Of that area, 113.9km² (56.1%) is rural, 61.9km² (30.5%) is industrial area and 22.2km² (10.9%) is park. The remaining 2.5% is made by small areas of residential, open space, seasonal, commercial, and institutional lands.

Indigenous Communities and Traditional Territories

- Located on the northwest shores of the lake, the Wahnapiatae First Nation community occupies a land base of 10.2km² and is home to over 170 residents and over 700 members. This Ojibway community of the Anishnabek Nation is a signatory of the Robinson Huron Treaty of 1850. The traditional name, 'Wahnapiataeping' means "place where the water is shaped like a tooth", in reference to Lake Wanapitei.
- The entirety of this subwatershed falls within the Wahnapiatae First Nations traditional territory and the Robinson-Huron Treaty Area #9.
- This area is also currently part of an active land claim.

Development Pressure

Overall: Low. Few people live on the shores of Lake Wanapitei relative to its large size, with the exception of the Wahnapiatae First Nation to the west and the community of Skead to the south.

- **Settlement Area:** 2.6 km² of land (0.7% of the subwatershed) in the community of Skead is designated as 'Settlement Area' under the City of Greater Sudbury's Official Plan.
- **Municipal Wastewater Facilities:** There are no municipal wastewater facilities within this subwatershed.
- **Forestry:** Located within the Sudbury Forest management area, this subwatershed has areas identified for harvest in the 2020-2030 Sudbury Forest Management Plan. These areas occur mainly within Scadding Township and in several areas bordering Wanapitei Lake Provincial Park.
- **Aggregates:** There are currently 48 active aggregate operations and 1 inactive operation, covering an area of 19.1 km².
- **Mining:** This subwatershed has high mineral potential and as a result has had a significant amount of mining related activity
 - Glencore's Nickel Rim South Mine (NRS) is in this area. NRS entered a state of Temporary Suspension in July 2024.
 - Within the last year, there has been active exploration of the Parkin Property, Frost Lake Property and Nickel Rim South Project.
 - There are currently 97 active Mining Plans and Permits registered to this subwatershed.
 - Historically, there were 5 producing mines in operation: Podolsky Mine, Whistle Mine, Nickel Rim Mine, Victor Mine and MacLennan Mine. Copper and Nickel were the main commodities in these mines, with gold, silver, cobalt and platinum also occurring.

Recreational Use

- Lake Wanapitei as well as the other rivers and lakes in this subwatershed are used for a variety of recreational activities including boating, canoeing, kayaking and swimming. The surrounding lands are also used for camping, hunting and general nature appreciation.
- Trails are plentiful for snowmobiling and off-road vehicle use. There is a groomed snowmobile trail that explores the perimeter of this subwatershed, managed by the Nickel Belt Snow Spirits.

- Much of the area that makes up Wanapitei Provincial Park is also located within this subwatershed, and despite it being a non-operating park, is readily used for seasonal trailer and tenting activities.
 - The sand bluffs along the north shore of Lake Wanapitei are one of the parks most notable features, formed from the active erosion resulting from artificial lake levels.

Water use

- There are currently 13 active Permits to Take Water within this subwatershed, held mainly by Glencore, FNX Mining and City of Greater Sudbury.

Notable Waterbodies

- **Lake Wanapitei:** Is the largest inland lake in the world contained within a city, covering an area of 132.56km² with a maximum depth of 142m. It supports 370 permanent residents and 180 seasonal residents.
- **Ella Lake** is a well-known lake within this subwatershed. Though much smaller, with an area of 1.6km² and a depth of 24m, it supports 28 permanent residents and 59 seasonal residents.

Previously and Historically Identified Issues

- Similar to the Upper Wanapitei River subwatershed, due to the nature of the substrate in this area, erosion is expected.
- In some areas surrounding the lake, the unconsolidated nature of the shoreline material, steep topography, and wave action due to the large size of the lake has caused concerns with shoreline stability and the overall erosion hazard. Development surrounding the lake is regulated by the Conservation Authorities Act.

Natural Hazard Identification and Regulation

Hazards and features regulated by Conservation Sudbury include flood and erosion hazards, wetlands, unstable soils, rivers, streams, creeks, and small inland lakes. More on these regulations can be found in the Conservation Authorities Act, O. Reg. 686/21 that addresses the risks of natural hazards.

- **Floodplain mapping:** Currently, outside of Lake Wanapitei, there is no floodplain mapping for this area.
 - The Lake Wanapitei flood hazard is defined by the maximum operating level of the dam of 267.95 m, plus an additional 1.2 m to account for wave uprush, resulting in a flood hazard elevation of 269.15 m.
 - In the absence of floodplain mapping, flood hazards are estimated based on site conditions. Typically, the extent of the flood hazard is estimated at 1.2 m above the bankfull elevation or high-water elevation.

- **Erosion hazard mapping:** Currently, erosion hazards are evaluated based on the general guidance from the MNRF for confined and unconfined systems.

Water Control Structures:

- Unregulated flow conditions exist upstream of Lake Wanapitei.
- The southern extent of the subwatershed is delimited by the Wanapitae Dam, operated by Ontario Power Generation. This dam regulates the water and marks the continuation of the Wanapitei River as it drains south, into the Lower Wanapitei River subwatershed.

Drinking Water Source Protection

- Municipal wells 5, 6 and 7 from the 'Falconbridge Drinking Water System' and their wellhead protection areas (WHPA) fall along the border of this subwatershed and the Emery Creek subwatershed. Despite the location of these municipal wells within the subwatershed, residents obtain and dispose of their water with private intakes, wells and septic systems.
 - The Falconbridge Well Supply is a groundwater system servicing the town of Falconbridge as well as several industrial sites. There are no known significant drinking water threats or known conditions within vulnerable areas and no known water quality issues for the Falconbridge wells.
- This subwatershed is also located within the headwaters of the Wanapitei River Drinking Water System, a municipal drinking water source. As such, all watercourses within this subwatershed and the lands immediately around them are classified as Intake Protection Zone 3 as the water ultimately drains towards the Wanapitei River drinking water intake.

Water Quality Indicators

Surface Water:

- Total phosphorus values for Lake Wanapitei and Ella Lake are categorized as oligotrophic, suggesting little urban impacts to the lake.
- St-Jean Lake, a smaller lake near Ella Lake, was mesotrophic, suggesting some urban impacts.

Groundwater:

- The Falconbridge Wells aquifer is classified as non-GUDI aquifer and has good water quality. The exception to this was slightly high levels of sodium in the treated water of one of the wells.

Significant Features

- Wanapitei Provincial Park, a non-operating park, falls mostly within this subwatershed, covering an area of 28.2 km².
- There are no ANSI ecological areas of interest.

- **Wildlife Values:**
 - There are 120 moose related wildlife value areas, covering a total area of 12.4km².
 - There are 2 wildlife value points for great blue heron nesting locations.
- Several kettle lakes exist south of the community of Skead in the vicinity of the Sudbury Airport. Though this area is not a designate significant area, it is locally recognized as an important natural heritage and geological feature of the area.

Management and Stewardship

- **Wahnapiatae First Nation and Atikameksheng Anishnawbek First Nation:** Their traditional territories include the area within these subwatersheds. They are land holders of the area and, as such, are significant stewards of the land.
- **City of Greater Sudbury Regreening Program and VETAC:** The CGS's regreening program has completed regreening work on 2.6km² (0.7 %) of this subwatershed.
- **Lake Wahnapiatae Home and Campers Association:** is an active stewardship group founded to protect and enhance the environment of the lake. Programs include shoal marking, septic tank pump-out rebates, water quality monitoring and shoreline conservation initiatives.
- **Ministry of Environment, Conservation and Parks:** Provincial Parks and Conservation Reserves are managed by MECP.
- **Glencore:** Because of their operations on the land, the company must complete regular environmental monitoring to comply with provincial and federal regulations. They also complete internal environmental monitoring and management work on their owned properties.

Data available

- **Co-operative Freshwater Ecology Unit:** Capreol Lake (aka Ella Lake) was sampled as a Reference Lake in the CFEUs long term monitoring of lakes recovering from Sudbury's mining legacy.
- **Lake Partner Program:** Lake Wanapitei, Ella Lake and St- Jean Lake have been sampled for Total Phosphorus as part of this provincially run, volunteer-based program.
- **Sudbury INO – Glencore:** As part of their regulatory requirements, Glencore has collected air, surface and groundwater quality data as well as information on natural heritage features (fish, benthic invertebrates, wildlife, etc.)

Supporting Documents

Conservation Sudbury, **Greater Sudbury Source Protection Area - Assessment Report**, September 2, 2014.

Geology of the Wanapitei Lake Area, MNRF, Burkhard O. Dressler, 1982

Wanapitei Provincial Park Management Statement (<https://www.ontario.ca/page/wanapitei-provincial-park-management-statement>), July 2001.



