

Timmins

Canada's Greatest Goldfields!

The Timmins area is one of the richest goldfields in the world, and over the past century has produced more gold than any mining camp in Canada. Today, the city of Timmins is northern Ontario's third largest city and remains one of Canada's major centres of mining. Not only is mining a key part of the city's heritage, but Timmins has also become a leader in rehabilitating former mining sites into parks and recreational lands. This GeoTour highlights Timmins' "Big Three" gold mines—Hollinger, Dome and McIntyre—as well as city parks reclaimed from former mine sites.



The iconic #11 headframe of the former McIntyre Mine rises across Pearl Lake from Highway 101.

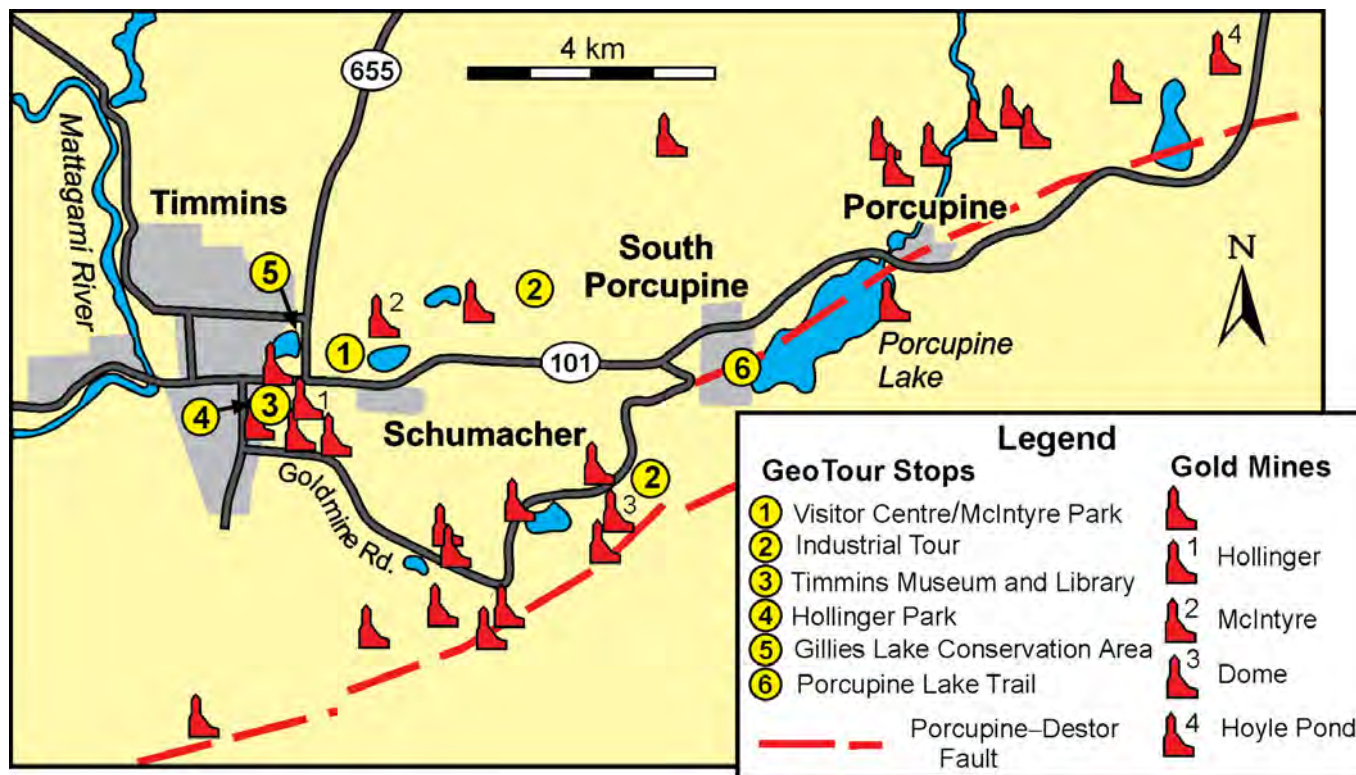
An aerial view of the Dome Mine, Canada's second largest all-time producer of gold. The former open pit mine is flanked by the mine mill buildings (lower left), red mine buildings (centre), waste rock piles (centre, behind red buildings) and low-grade ore stockpiles (centre right). Porcupine Lake and the town of South Porcupine lie in the background. *Photo courtesy of the City of Timmins.*



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How to get there

The city of Timmins is 290 km north of the city of Greater Sudbury via Highway 144. Most stops in this GeoTour are close to Highway 101 and Timmins city centre. Stop 2 (Industrial tour of Dome Mine and reclamation sites) is only available as part of a guided tour arranged through Tourism Timmins at the visitor welcome centre (Stop 1).



A map of the Timmins area showing the location of GeoTour stops. Urban areas are shown in grey. Also shown are present and former gold mines. Those mentioned in this GeoTour are numbered. Many gold mines occur near an ancient geological break in the Earth, the Porcupine-Destor Fault.

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There's gold in the Porcupine!

Provincial geologists first identified gold in quartz veins near Porcupine Lake in 1896. In the spring of 1909, a prospecting team led by Harry Preston and Jack Wilson discovered a hill of quartz full of gold and called it "The Big Dome". As legend has it, Harry Preston slipped on a rocky knoll and his boots stripped the moss away from the rock to reveal a large vein of gold. This discovery set off the great Porcupine Gold Rush. Later the same year, prospectors discovered the Hollinger and McIntyre gold deposits. The villages of South Porcupine, Timmins and Schumacher sprang up to serve each of the "Big Three" mines developed on these gold deposits. During the next hundred years, over 50 mines produced 70 million ounces of gold, making the Porcupine mining camp (later referred to as the Timmins mining camp) Canada's greatest gold producer. If discovered today, the collective gold of the Timmins goldfields would have an astonishing value of \$100 billion dollars. The Hollinger–McIntyre gold deposit, which geologists consider a single body of ore, ranks as the world's second greatest gold producer, behind only the fabulous Golden Mile in Kalgoorlie, Western Australia. Gold continues to be discovered today: Timmins' newest mine opened in 2011.



The original Dome Mine claim was staked over a large dome-like outcrop of quartz with very coarse, nugget-like gold. The quartz-rich rock was resistant to erosion over the eons, resulting in a hill known to miners as Big Dome.

Photo courtesy of the Timmins Museum Collection.



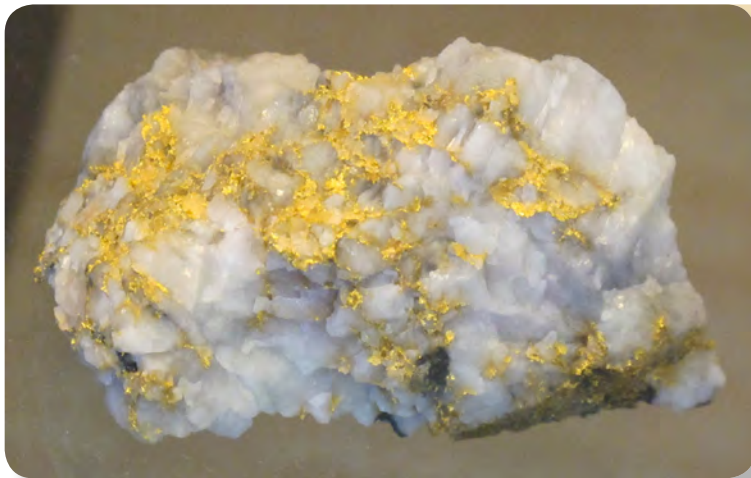
Father Paradis and Mr. Edwards, a financial backer for the Dome prospecting expedition (right), sitting on Big Dome and a four-foot wide vein of quartz with coarse gold.

Photo courtesy of the Timmins Museum Collection.

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Ancient fault origins of a giant gold camp

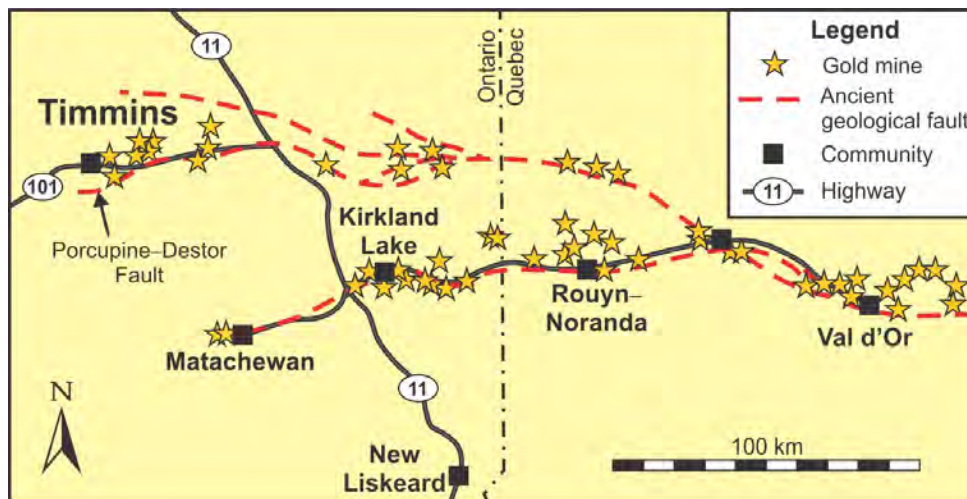
Located along the southern edge of northern Ontario's Great Clay Belt, the Timmins area is underlain by extensive glacial deposits. Below this glacial veneer lie 2.7 billion-year-old volcanic and sedimentary rocks of the Canadian Shield. These rocks have been deformed by heat and pressure while buried deep in the Earth, contorted into folds and then broken by the Porcupine–Destor Fault. This ancient geological fault in the Earth's crust extends over 180 km from Timmins to Quebec. Gold mines in Timmins lie close to this fault. Geologists believe that movement on this ancient fault 2.6 billion years ago folded the rocks and allowed gold-rich fluids to rise along the fault from deep in the Earth, creating gold-quartz ore.



Gold-quartz ore from Hoyle Pond Mine, east of the town of Porcupine and near Highway 101. Gold throughout the Timmins mining camp is largely found in quartz veins.



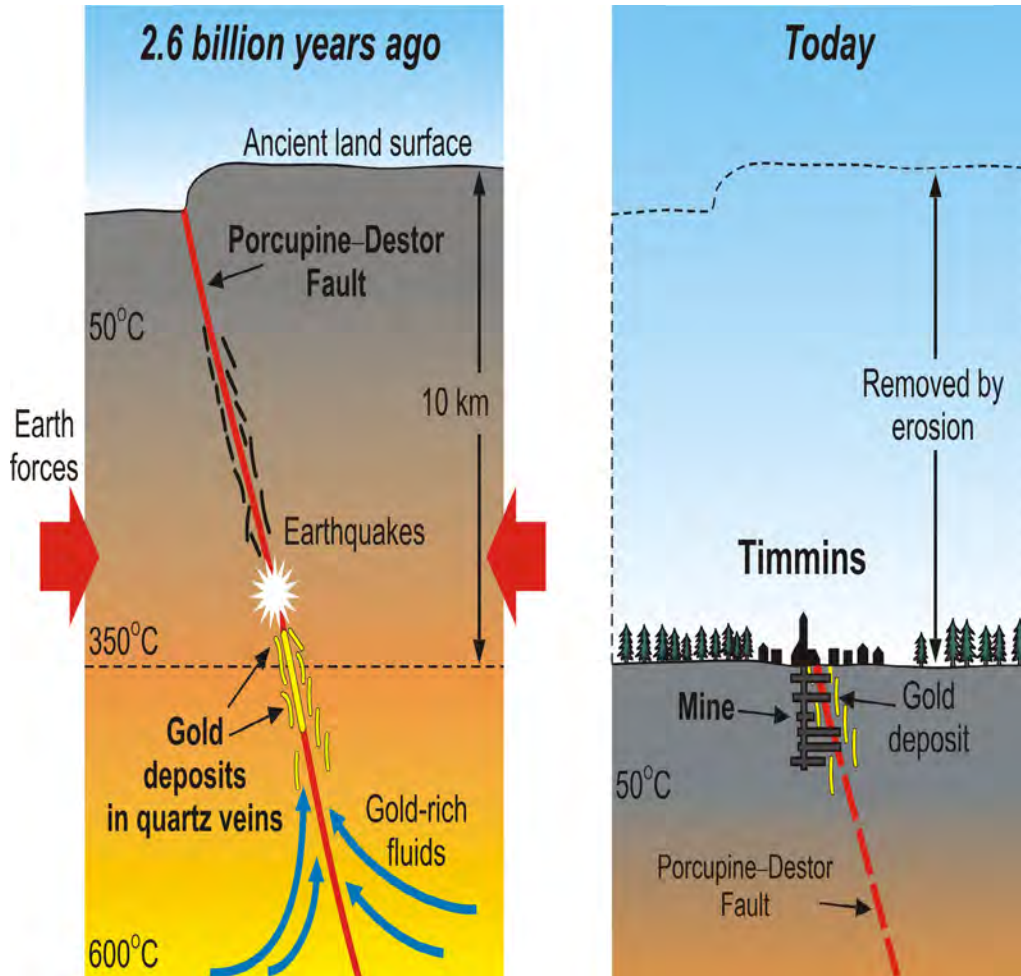
The Canadian Shield underlying the Timmins area is rich in volcanic rocks. This outcrop in Schumacher formed from ancient lava. It has pillow-like textures that geologists believe formed during undersea volcanic eruptions more than 2.7 billion years ago.



The Porcupine–Destor Fault is one of a family of geological faults in the border region between northern Ontario and Quebec. Major gold mining camps are closely related to these faults.

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Early prospectors knew gold was often associated with quartz veins. Today, geologists know why this is. Quartz veins filled ancient cracks linked to the Porcupine–Destor Fault, which once served as a channelway for mineral-rich hot waters. Cracks formed adjacent to the fault as it moved 2.6 billion years ago, allowing mineral-laden waters to enter and deposit quartz and gold.



Gold-bearing quartz veins (white) exposed underground in the Dome Mine in 1936. Photo courtesy of the Timmins Museum Collection.

The gold-quartz ores of Timmins goldfields formed deep in the Earth along the ancient Porcupine–Destor Fault during continental collision. Erosion has since removed the overlying rock and exposed the ore at surface.

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Reclaiming the lands

A major environmental issue for Timmins has been the reclamation of fine-grained rock waste, or *tailings*, that was produced by grinding and milling gold ore. Before present day environmental awareness and in the early days of these mines, tailings from mills were dumped into nearby lakes and wetlands. In later years, tailings were piled in extensive flat-topped hills called *tailings piles*. Such dry tailings piles produced dust storms and could erode into streams during extreme rainfalls. Extensive reclamation efforts to stabilize historic tailings throughout the Timmins area started about 20 years ago. Modern mining operations are required to have closure plans that rehabilitate all mine wastes.



A dry tailings pile near the former Delnite gold mine prior to remediation. Runoff from rain and snowmelt has eroded gullies in the slope.



To stabilize the edges of a tailings pile, the slopes are contoured to a reduced gradient, armoured with fabric (black) and then gravel (grey), and a berm is constructed at the base (left) to prevent erosion and runoff.



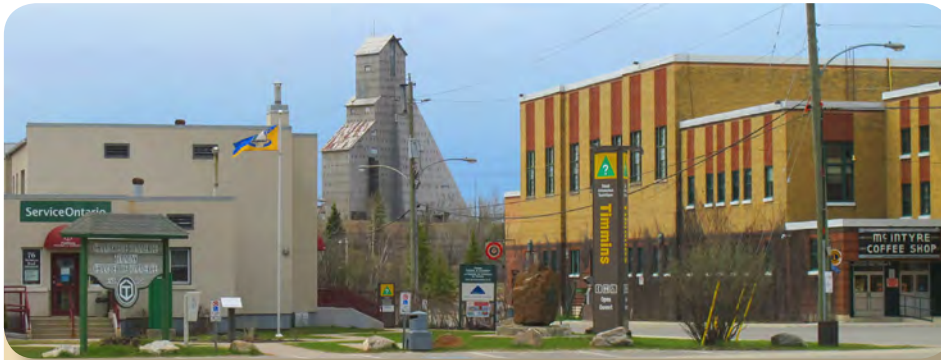
The tops of tailings piles are covered with composting paper mill sludge (brown) to create a rich soil for seed mixtures chosen to suit the site conditions. Native plant species also take root from wind-blown seeds. Eventually, reclaimed tailings, such as these near the McIntyre Mine, will become recreational lands for the community.

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➤ Stop 1: Visitor welcome centre and McIntyre Park

GPS co-ordinates: N48° 28.644', W81° 17.922'

Start your GeoTour by dropping into the visitor welcome centre in historic Schumacher, just east of downtown Timmins, on McIntyre Road, just north of Highway 101. The centre is run by Tourism Timmins, and staff can provide advice about things to do in the area (Telephone: 1-800-387-8466 or email: tourism@tourismtimmins.ca). This is where an industrial tour (GeoTour Stop 2) can be booked. There is an interesting collection of ore samples from mines in the Timmins area on the front lawn.



Stop 1: The visitor welcome centre (left) is across the street from the historic McIntyre Arena (right). The arena was built as a smaller replica of famous Maple Leaf Gardens in Toronto. The headframe of the former McIntyre Mine is in the background.



Stop 1: Folded quartz veins (white) in 2.7 billion-year-old rock can be seen in a block of gold ore on the lawn of the visitor welcome centre. The veins, which contain fine gold, originally formed along planar fractures but were contorted by Earth forces when movement occurred along the Porcupine–Destor Fault.



Stop 1: A rusty 29-tonne block of copper-zinc-silver ore from the Kidd Creek Mine sits on the front lawn of the visitor welcome centre. The mine is 22 km north of Timmins along Highway 655 and is one of the world's largest and deepest copper-zinc-silver mines. Mine workings descend more than 3 km into the Earth. The discovery of this giant ore deposit in 1963 was a vital boost to the Timmins economy and the mine continues to be the largest employer in the Timmins area.

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McIntyre Park, also known as the Schumacher Lions Club Park, is a short walk north along McIntyre Street from the visitor welcome centre. This pleasant waterfront park, located between Pearl and Little Pearl Lakes, sits on land reclaimed from tailings from the nearby former McIntyre Mine. McIntyre Trail follows the north shore of Little Pearl Lake, past marshes filled with wildlife. The park contains the very moving Miners Memorial, a display of historic mining equipment, and a lakefront dock.

Prospectors Sandy McIntyre and Hans Buttner staked their claims on the shores of Pearl Lake in 1909. The McIntyre Mine produced almost 11 million ounces of gold over its 78-year history, making it Canada's 3rd largest producer of gold. Only Hollinger Mine and Dome Mine have produced more. Interestingly, the McIntyre and Hollinger mines each worked a part of a single giant body of ore.

The shaft below the McIntyre headframe descends 2.5 km and accesses many kilometres of tunnels in the former mine.

Tailings from the McIntyre Mine filled the western end of Pearl Lake, including the area now occupied by Little Pearl Lake. By the 1970s, a forest covered these tailings. In the 1980s, a mining company dug up the tailings and reprocessed them to extract remaining gold. In doing so, they created a pit that filled with water and is now Little Pearl Lake. Little Pearl Lake still receives mine effluent today and is technically a tailings pond.



Stop 1: A view from McIntyre Park across Pearl Lake to the headframe of shaft #11 of the former McIntyre Mine.



Stop 1: The Miners Memorial commemorates the miners who have died working in the mines of the Timmins area.

➤ Stop 2: Industrial tour of Dome Mine and reclamation sites

Different industrial tours can be booked for free during the summer at the visitor welcome centre (see GeoTour Stop 1). One of the tours includes a visit to both the Dome Mine and reclamation sites, and is featured here. The Dome Mine is located south of Highway 101; reclamation sites, north of the highway.



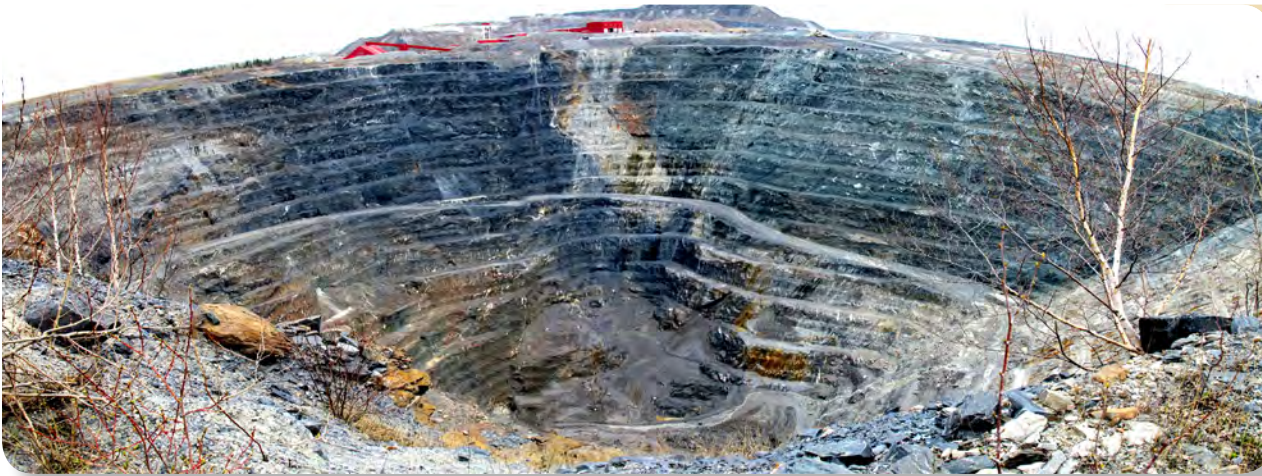
Stop 2: The concrete headframe of Dome Mine rises above its underground shaft, which accesses many kilometres of mine tunnels, some as deep as 1670 m.

Stop 2: The Dome Mine mill and cyanide leach plant. Here, gold-quartz ore is crushed to a fine powder and mixed with a cyanide-containing solution to dissolve the gold into solution. By passing an electric current through this gold-bearing solution—a process called electrolysis—gold is then extracted from the solution as metal, in solid form. The gold is shipped from the mine as gold bars, 82% pure, that also contain 12% silver. The mill can process 12 000 tons of ore per day.



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The Dome Mine is Timmins' first producing gold mine and Canada's second largest all-time gold producer, behind only the Hollinger Mine. By 2013, the mine had produced over 18 million ounces of gold. The mine has been in continuous production since 1910, longer than any other gold mine in North America. The mine began underground but expanded into an open pit operation in the early 1990s. Open pit operations have since ceased and currently all mining is underground. The industrial tour passes by the mine headframe and mill and stops at an overlook above the former open pit of the mine.



Stop 2: The mined-out Dome Mine open pit from the overlook. Over 286 million tonnes of rock have been removed to create a hole 340 m deep and 800 to 900 m across. Beyond the pit are the mine buildings (red) and waste and low-grade rock stockpiles. Gold ore occurs in quartz veins in volcanic and sedimentary rock exposed on the pit walls.

Stop 2: Reclaimed land near the former Coniaurum Mine, northeast of Schumacher. A sign describes the history and stages of reclamation. Although seeds are chosen to suit site conditions, reclaimed lands are also naturally colonized by grasses and herbs, then shrubs and trees.



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➤ Stop 3: Timmins Museum and Library

GPS co-ordinates: N48° 28.411', W81° 19.600'

The Timmins Museum and National Exhibition Centre at 325 Second Avenue, Timmins (website: www.timminsmuseum.com), has restored prospectors' cabins, bronze statues of the discoverers of the Big Three mines and an archival collection of 20 000 images of the Timmins mining camp. Across the street is the Timmins Public Library. A large block of gold ore near the library entrance commemorates the gold mines of the Timmins area.



Stop 3: A bronze statue at the museum commemorates the prospectors who discovered Timmins' greatest gold mines: Sandy McIntyre (McIntyre Mine), Jack Wilson (Dome Mine) and Benny Hollinger (Hollinger Mine). *Photo courtesy of Graeme Oxby and the Timmins Museum Collection.*

Stop 3: This 2.7 billion-year-old gold ore from the Pamour Mine contains 3.5 g (or about 0.1 ounces) of gold per tonne of rock. The ore contains gold-bearing quartz veins, typical of all Timmins' gold mines.



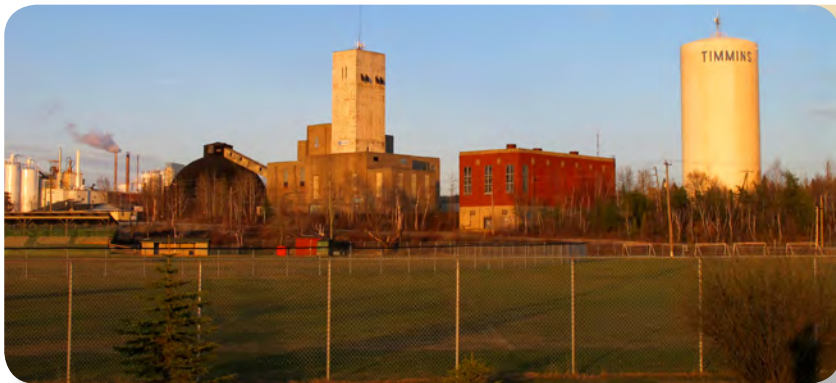
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➤ Stop 4: Hollinger Park

GPS co-ordinates: N48° 28.539', W81° 19.281'

Hollinger Park, one of Timmins' busiest recreational spaces, is an early example of mine reclamation in northern Ontario. The park was created in the 1940s by reclaiming the former Hollinger Mines tailings pile area. The Hollinger Mine, Canada's largest all-time gold producer, operated from 1910 to 1968 and produced over 19 million ounces of gold. The original settlement of Timmins was built to serve the Hollinger Mine. Access to the park is off Brunette Road, just a half block south of Highway 101.

Further reclamation is currently underway of a large area of the Hollinger Mine property beyond the headframe to the south and east. A large open pit will be mined to remove unstable rock in danger of subsiding into underground workings and to deal with the existing hazard of many small mine openings. The area will be reclaimed as a lake surrounded by parkland and walking trails.



Stop 4: View from Brunette Road of the former Hollinger Mine site, looking southeast across the sports playing fields of Hollinger Park. The tall rectangular concrete building (centre) is the former headframe of the Hollinger Mine. The shaft below the headframe descended about 1.6 km into the Earth. The black dome-like building stored ore, hoisted up the shaft from the mine below. The park's playing fields are built on the flat surface of the former mine tailings.

Stop 4: View of Hollinger Mine and former Miller Lake in the 1920s, looking southeast from the city of Timmins. Miller Lake was filled with tailings from the mill (left), forming the flat area that today are Hollinger Park's playing fields. *Photo courtesy of the Timmins Museum Collection.*



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➤ Stop 5: Gillies Lake Conservation Area

GPS co-ordinates: N48° 28.903', W81° 18.787'

Gillies Lake is a popular walking area on the edge of downtown Timmins. There is a 2.5 km walking path, with benches and interpretive signs, that circles the lake. The open grassy slopes, scattered trees and shrubs, and pocket shoreline marshes are part of a decade-long reclamation project started in the early 1990s that has made Gillies Lake a showpiece for mine reclamation in Ontario. The original lake was once 3 times its present size and extended to the northeast across Highway 655 but was filled with tailings from the Hollinger Mine. The conservation area can be accessed from Highway 655, about half a kilometre north of Highway 101.



Stop 5: View across Gillies Lake and Highway 655 to a reclaimed tailings area that has filled the northeastern extension of Gillies Lake.

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➤ Stop 6: Porcupine Lake Trail

GPS co-ordinates: N48° 28.734', W81° 12.302'

It was on the shores of Porcupine Lake that geologists for the Ontario Bureau of Mines first reported gold in quartz veins in 1896. Prospectors came to the area via the Porcupine Trail, a series of overland portages connecting rivers and lakes to the railway to the east. The lake was central to early discoveries in the eastern part of the Porcupine goldfields (later called the Timmins mining camp), and communities such as South Porcupine, Golden City and Pottsville sprang up on its shores. The Porcupine Lake Trail, or Prospectors Trail, is an 8.5 km loop around the shores of the lake and forms part of the Bart Thompson Trail System. White Waterfront Park, at the east end of Bloor Road in South Porcupine, provides access to the trail. From the park, it is a pleasant 15 minute walk along the trail to the north to a lakeside bluff with a viewing shelter and interpretive signs that describe the human and natural history of the Porcupine Lake area.



Stop 6: Interpretive signs on a small lake shore bluff along the Porcupine Lake Trail near Northern College. The waste rock piles of the Dome Mine rise across Porcupine Lake and form a striking hill on an otherwise flat landscape.

Stop 6: Gigantic piles of waste rock from the Dome Mine form a hill rising above the community of South Porcupine, on the shores of Porcupine Lake. The size of this man-made hill attests to the scale of gold mining in the Timmins area.



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