# MAPPING THE CUMULATIVE EFFECTS OF INDUSTRIAL PROJECTS ON LAKE SUPERIOR'S NORTH SHORE

A Map Reflecting the Cumulative Effects of Generation PGM's Marathon Palladium Project, Prepared for CRINO, in Partnership with MiningWatch Canada

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# Table of Contents

Preamble	1
Map	2
Table 1: Industrial Sites Located Within Lake Superior's North Shore Watershed	3
References for Preamble	18
References for Table 1	18

### Preamble

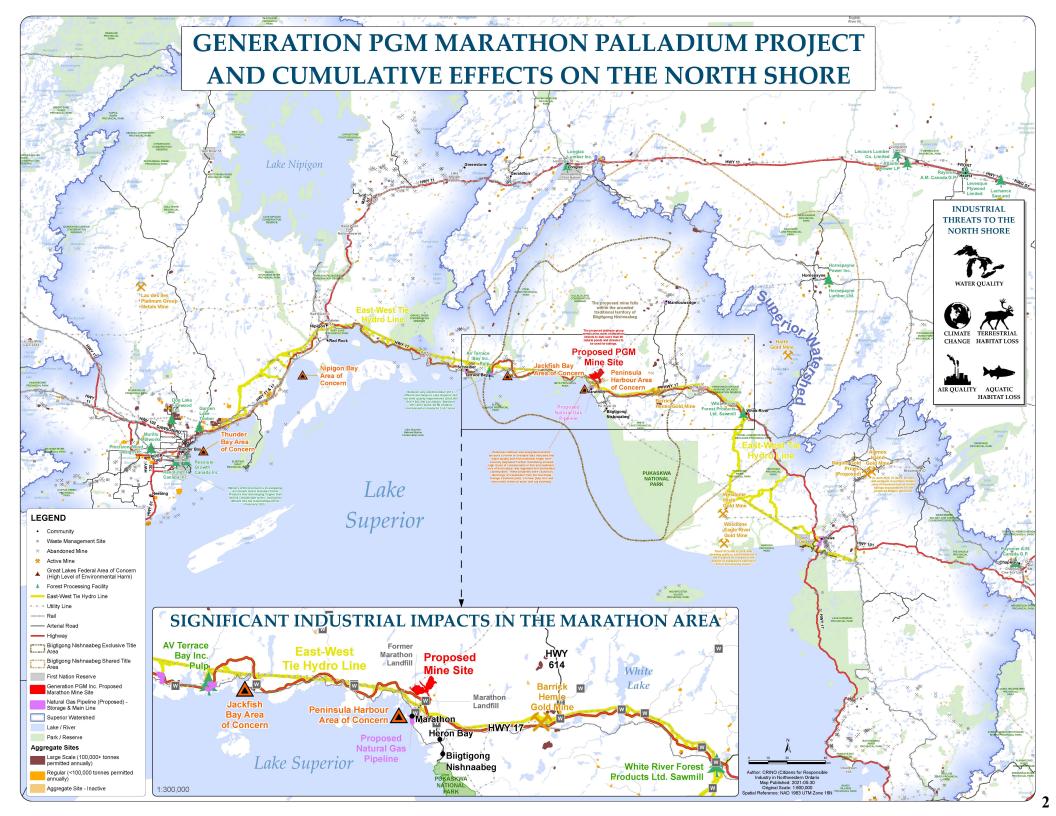
The Citizens for Responsible Industry in Northwestern Ontario (CRINO) supports responsible industrial development and natural resource extraction activities within Northwestern Ontario. CRINO works to ensure that any projects being approved within the Lake Superior watershed are carefully assessed to ensure that there are no significant impacts to air quality, aquatic habitats, climate change, terrestrial habitats, and water quality along Lake Superior's North Shore.

According to the WWF's Watershed Reports, the Northeastern portion of Lake Superior's watershed (which encompasses the Town of Marathon) is in "fair" overall health. However, water quality in this watershed is "poor", and threats are ranked overall as "high": pollution is "very high" risk; habitat fragmentation is "high" risk; and overuse of water is "very high" risk. Additionally, the Northwestern portion of Lake Superior's watershed (which encompasses the City of Thunder Bay) is assessed with "very high" risk threats, such as: pollution is "very high" risk; habitat fragmentation is "high" risk; overuse of water is "very high" risk; alteration of flows is "very high" risk; and climate change is "moderate" risk. For this watershed to improve its overall health, careful assessment and monitoring of cumulative effects is necessary.

Assessing Cumulative Effects involves the examination of the environmental effects (including those arising from malfunctions and accidents) that are likely to result from a project in combination with other physical activities that have or will be carried out. Cumulative Effects may be <u>additive</u> (which is the sum of 2 or more effects); <u>synergistic</u> (which is result of the interaction between 2 or more effects, when the resultant combination is greater or different than the simple addition of the effects); <u>compensatory</u> (which is when effects from 2 or more activities "offset" each other); or <u>masking</u> (which is when one effect makes another effect undetectable, i.e., "masking it"). Therefore, the purpose of assessing cumulative effects is to "...examine a project's aggregate, as opposed to individual, effects." A small scale environmental effect from a mining project can still cumulatively impact the quality of the air, land, and water within an ecosystem and/or community.

CRINO developed this map to assist the Joint Review Panel in assessing how the Generation PGM Marathon Palladium Project may cumulatively affect the Lake Superior's North Shore. This map arose from concern that the mining proponent's scoping of cumulative effects in the Environmental Impact Statement was too narrow, as it did not consider Lake Superior's watershed as a whole. There are a variety of environmentally intensive projects that have been or will be operating throughout the watershed, and these projects all need to be considered when assessing the Marathon Palladium Project's presence on the shores of Lake Superior.

With the recent signing of the 2021 Canada-Ontario Great Lakes Agreement, there is a recognition by both levels of government that "...restoration and enhancement of Great Lakes water quality and ecosystem health cannot be achieved by addressing individual threats in isolation, but rather depend upon the application of an ecosystem approach that addresses individually and cumulatively all sources of stress to the Great Lakes." Therefore, a broader lens is needed for assessing the cumulative effects of the Marathon Palladium Project on the northern portion of Lake Superior's watershed to protect air quality, water quality, and habitat within the region.



# Table 1: Industrial Sites Located Within Lake Superior's North Shore Watershed

#### **Industrial Threats to the North Shore (Watershed Risks)**



PROJECT NAME	LOCATION IN WATERSHED	TYPE OF INDUSTRY	INCLUDED IN PROPONENT'S CUMULATIVE IMPACTS MAP?	OPERATING TIMELINE OF PROJECT	WATERSHED RISKS	NOTES ABOUT SITE'S OPERATIONS	ENVIRONMENTAL ENFORCEMENT AND/OR FINES?
Geco Mine	North of Manitouwadge, ON	Base-metal mine	Y	Inactive	n	"an estimated 90 cubic feet per minute of water discharge will require long term treatment, at substantial cost, into perpetuity."	
Wilroy Mine	North of Manitouwadge, ON	Base-metal mine	Y	Inactive	n	"An estimated 90 cubic feet per minute of water discharge will require long term treatment, at substantial cost, into perpetuity."	
Winston Lake Mine	North of Schreiber, ON	Copper/Zinc mine	Y	May be subject to redevelopment as Superior Lake Zinc Project (currently in exploration phase) Mine life of new project estimated to be 9 years		Currently on site: Tailings management facility and freshwater dam. For future project: Environmental Compliance Approval (ECA) for any discharges to air or water, with the latter including potentially separate approvals and treatment processes for industrial wastewater and domestic sewage generated from the mine operations.	
Golden Giant Mine, (part of Barrick Hemlo Gold Mine Camp)	40 km east of Marathon, ON	Gold Mine	Y	Ceased production in 2014.	* 72	Currently in Remediation Phase. Water treatment and tailings management required in perpetuity.	

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David Bell Mine (part of Barrick Hemlo Gold Mine Camp)	40 km east of Marathon, ON	Gold Mine	Y	Ceased Production in 2010.	# Tr	Currently in Remediation Phase. Water treatment and tailings management required in perpetuity.	
Williams Mine (part of Barrick Hemlo Gold Mine Camp)	40 km east of Marathon, ON	Gold Mine	Y	Expected to operate until 2031		Underground mining operation only. Treated surface water discharge into the Black River, a tributary of the Pic River, and enters the Pic River approximately 18 km downstream of the Proponent's Site Study Area.	
Harte Gold Sugar Zone Mine	30 km northeast of White River, ON	Gold Mine	Y	Estimated 13 Years (2019-2032, at current production levels)		The Operation adjoins the Dayohessarah Lake watershed, a valued recreational lake. As such, emphasis has been placed on controlling discharges of water, fugitive dust and noise to avoid potential negative effects on Dayohessarah Lake and its watershed.  RE: Potential Impacts Due to Effluent Discharge: Effluent discharged from the Operation will report to Gagegenha Lake. Gagegenha Lake drains via Gagegenha Creek, which subsequently joins with Dayohessarah Creek. Dayohessarah Creek then flows north and joins the Strickland River, which later joins the Shabotik River before it enters White Lake to the southwest. White Lake drains to White River, which flows to Lake Superior.	

Wesdome Eagle River Gold Mine	100 km Southeast of Marathon, ON	Gold Mine	Y	In Production since 1995.	Sustainability Report (there were 4 exceedances in accordance with regulatory requirements):  2015: The Eagle River Mine effluent discharge just about exceeded, on one occasion, the daily limit of 0.20 mg/L for the parameter of un-ionized ammonia with a value of 0.22 mg/L.  2018: The Eagle River Mine effluent discharge exceeded the daily limit of 30mg/L for the parameter of Total Suspended Solids on two different days (May 6 and May 8). These exceedances were attributed to insufficient flocculant addition rates and corrective actions were quickly implemented. However, the monthly average TSS concentration was 12 mg/L and did not exceed the regulatory monthly average limit of 15mg/L.  On April 30, 2018, a controlled discharge from the Miron Creek Tailings Management Area Polishing Pond commenced as per the Amended Environmental Compliance Approval. The discharge concluded on May 18, 2018. During the discharge period, three exceedances occurred above the acute lethality limit of 50% for Daphnia magna: 70% on April 30, 100% on May 2, and 100% on May 3. The occurrences were monitored throughout the process and there was no mortality of rainbow trout detected.  2019: The Tailings Management Area effluent discharge from the Polishing Pond exceeded the monthly average limit of 15 mg/L for the parameter of Total Suspended Solids with an average of 16 mg/L once in September. This exceedance was believed to be caused by an algae bloom and was not believed to have any negative effect on the natural environment because acute toxicity samples were taken during this time had 0% mortality for Daphnia Magna and rainbow trout.	February 22, 2016: fined \$175,000 after pleading guilty to contraventions of the Fisheries Act related to the deposit of substances harmful to fish in fish-bearing waters. Ordered to pay an additional \$175,000 related to provincial offences, following charges laid by the Ontario Ministry of the Environment and Climate Change.
Wesdome Mishi Gold Mine	100 km southeast of Marathon, ON	Open Pit Gold Mine	Y	In Production since 2002. After intermittent use, this site was mined out in 2020. Plans to	2013: An amendment to Environmental Compliance Approval Number 7270-8KZKVW was issued for Mishi Pit mine water treatment and discharge works, located 52 kilometres south on Paint Lake Road from Highway	

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				use the pit as water storage as a part of the water management process.		17, in the Unsurveyed District of Thunder Bay, Ontario. The approved sewage works consist of the collection and transmission of seepage and precipitation/runoff from Mishi Pit into a 41,325 cubic metre settling pond for treatment, discharging under seasonal regime via a ditch eventually to Macassa Creek.	
AV Terrace Bay Inc.	Terrace Bay, ON (approx. 100 km west of the Proponent's Site Study Area)	Forest Processing Facility	Y	Pulp mill production restored in 2012 when purchased by Aditya Birla Group.		Treated effluent from the mill discharges to Blackbird Creek that enters Lake Superior in Jackfish Bay (AOC)	Between July and December 2013, effluent discharge to Lake Superior did not meet quality requirements: \$250,00 + \$62,500 surcharge. Has violated environmental standards 2457 times between 2011-2014.

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East- West Tie Transmission Line	450 km double- circuit 230 kV transmission line connecting the Lakehead Transfer Station in the Municipality of Shuniah near the city of Thunder Bay to the Wawa Transfer Station located east of the Municipality of Wawa. It will also connect to the Marathon Transformer Station.	Electricity Transmission Line	Y	Construction Timeline of 26 months (estimated completion early 2022)		The proposed project generally parallels the existing East-West Tie transmission corridor but avoids some sensitive features crossed by the existing line, including Pukaskwa National Park. The proposed right-of-way (cleared area) for the project is expected to be up to 64 m (210 ft) wide.  Project's EA Report indicated significant effect on Woodland Caribou, and Little Brown Myotis.	

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Marathon Pulp Inc.	Marathon, ON	Former Forest Processing Facility (Pulp Mill). Town of Marathon has interest in redeveloping brownfield site for economic development.	Y	Mill closed in 2009		The order contains requirements that provide for the continuation and updating of this environmental work, and includes, but are not limited to, the following:  1. On-going long-term groundwater monitoring and sampling program at the property until such time the ministry determines it is no longer necessary.  2. An annual groundwater monitoring and sampling report that will interpret the results of the monitoring program and contain any recommended changes based on the results.  3. Registration of the order on title for the property and requirements that a copy of the order be provided to any future interested purchaser of the site to create awareness of ongoing site requirements until such a time that they are deemed no longer necessary by the ministry.  4. A requirement that financial assurance be provided to the ministry to ensure that long-term monitoring requirements are implemented. In accordance with ministry policies, the town will not be required to provide financial assurance; however, this requirement will be effective on any subsequent owner in the event of a sale of the site. The amount of financial assurance required will be determined in accordance with the ministry's guidelines for any remaining monitoring work at site.	Order to Prevent Discharge of Contaminants: On September 23, 2019 the MECP issued the Director's Order to the Town of Marathon to carry out ongoing site work at the former mill property in Marathon that will prevent, decrease or eliminate adverse effects, including the discharge of contaminants into the natural environment. The order is issued on consent of the town, waiving its right of appeal.
Town of Marathon Landfill	Marathon, ON	Municipal Waste Management Site	Y	Capacity for 100 years of waste disposal. Commissioned in 2015	7	The decomposition of organic waste in landfills produces a gas which is composed primarily of methane, a greenhouse gas contributing to climate change. Emissions from Canadian landfills account for 20% of national methane emissions. (Environment and Climate Change Canada).	

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Town of Marathon Waste Transfer Station	Marathon, ON	Municipal Waste Management Site	Y	Site of former Marathon Landfill, which closed in 2015	72-0	The Transfer Station is prohibited from accepting the following:  i. liquid non-hazardous waste; ii. solid or liquid hazardous waste; iii. biomedical waste (excluding sharps and pharmaceuticals); iv. PCB waste; v. explosive waste; and vi. compressed gas cylinders with valves installed, excluding propane tanks, used for cooking.	
Marathon Mercury Disposal Site	Marathon, ON	Industrial Waste Management Site	N	Closed	TO	Requires maintenance and monitoring of groundwater quality and heavy metal levels.	
Magino Gold Project	Dubreuilville, ON	Open-Pit Gold Mine	Y	Operate for approximately 12-15 years (mining occurring for approximately 10 years)		"On June 11, 2020, 21 lakes, streams and wetlands in northern Ontario were re-characterized as a mine tailings impoundment for the proposed Magino gold mine."  "Magino is on the site of a former underground mine and is considered a "brownfield site." Around Wawa, the legacy of arsenic contamination from historic mines and mills continues to be a problem, and in the area near the Magino project there are ten abandoned mines". (MiningWatch.ca)  Minister of Environment and Climate Change Canada Issued Environmental Assessment Decision Statement on January 24, 2019	

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Proposed Liquified Natural Gas (LNG) Pipeline	of natural gas pipelines in the Town of Marathon, Township of Manitouwadge, Township of Schreiber, Township of Terrace Bay and Municipality of Wawa.	Natural Gas	N	Proposed		Phase 1 of Project Approval approved by Ontario Energy Board February 27, 2020: see <u>Decision and Order</u>	
Resolute Growth Canada Inc.	Thunder Bay, ON	Forest Processing Facility	N	Ongoing for foreseeable future		Products: Lumber, wood pellets  On July 16, 2020, the sawmill shipped its four billionth board foot of construction-grade lumber. Since 2003, wood produced in Thunder Bay has been providing solid foundations for homes, renovation projects and other structural applications.	
Resolute FP Canada Inc.	Thunder Bay, ON	Forest Processing Facility	N	Ongoing for foreseeable future		Products: market pulp (most commonly used material to make paper and tissue), newsprint  "Our Thunder Bay pulp and paper mill responsibly sources wood fibre through certification to the Sustainable Forestry Initiative® (SFI®) standard as well as the Programme for the Endorsement of Forest Certification (PEFC) and Forest Stewardship Council® (FSC®) chain-of-custody standards."	Ministry of Environment investigating an incident where Resolute Forest Products was discharging "higher than normal contaminant levels" through its effluent into the Kaministiquia River (February 2021).
Murillo Millworks	Murillo, ON	Forest Processing Facility	N	Ongoing for foreseeable future	AT.	Small scale operation.	

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Precision Wood Design Inc.	Murillo, ON	Forest Processing Facility	N	Ongoing for foreseeable future		Small scale operation.  2011: will modernize and expand its sawmill and remanufacturing facility to produce framing stock, paneling, dimensional lumber, trim and mouldings, creating six new jobs and protecting four.	
Dog Lake Firewood Ltd.	District of Thunder Bay, ON	Forest Processing Facility	N	Ongoing for foreseeable future	AT.	Products: process and sell cut & split firewood.	
Garden Lake Timber	Shuniah, ON	Forest Processing Facility	N	Established in 1980		Family owned and operated business.  Garden Lake Timber is a well-established supplier of Core Trays [for core and soil samples in mining] and Rack Systems with over 30 years' experience in manufacturing and supply for the Mining Industry of Northwestern Ontario.	
Lac des lles Platinum Group Metals Mine	District of Thunder Bay, ON	Palladium Mine	N	Open-pit mining began in 1993. Mine life has been extended until 2027		The Lac Des Iles mine is an open-pit and underground operation located 85km from Thunder Bay in Ontario, Canada. The mine consists of the Roby zone and the offset zone and extends over 86.4km² of mineral claims and leases.  2015: "A potential catastrophe downstream from Lac Des Iles Mine has been averted, says a Ministry of the Environment and Climate Change official. New water quality tests show no damage to the aquatic environment after a tailings pond sinkhole caved in on June 4. Afraid the resulting flow would cause failure of another dam, the Ministry of the Environment allowed the mine to discharge tailings into the watershed. Had a second dam burst, MOE issues projects coordinator Lisa Brygidyr said a million cubic metres of contaminated water could have entered the environment." (TBNewsWatch).	

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Longlac Lumber Inc.	Longlac, ON	Forest Processing Facility	N	Ongoing for foreseeable future		In March 2019, Vice President of the company commented on an ERO posting for 10th Year Review of Ontario's Endangered Species Act: Discussion Paper: "Further, we remain extremely concerned about role of the Federal Government and potential negotiations with Ontario on Conservation Agreements. For example, a MNRF socio-economic analysis determined that up to 2800 jobs could be lost and 8 mills could close as a result of the province meeting the federal disturbance thresholds for caribou. It is our expectation that Ontario will consult with us well in advance of any draft and will not enter into a Conservation Agreement with the Federal Government that will result in lost jobs and lost opportunity.  In order to avoid serious socio-economic impacts, we need permanent recognition that the CFSA is an equivalent process to the ESA, while developing workable species at risk policy, and sending a strong message to the Federal government that Ontario will manage our own resources."	

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Lecours Lumber Co. Limited	Hearst, ON	Forest Processing Facility	N	Established in 1943; operations ongoing for foreseeable future		From company website: "The company presently owns and operates a modern sawmill and planing facilities located 37 km west of Hearst in Calstock, Ontario Canada. Our growth in production was through a series of acquisitions of other producers that took place in the 80's and 90's. The total annual softwood lumber capacity exceeds 100 million board feet which is shipped in Canada and the United States either by trucks or rail cars.  Our current annual conifer supply commitments of approximately 476,000 cubic meters are secured under four separate long-term Sustainable Forest License agreements (SFL) with the Ontario Ministry of Natural Resources, the largest forest tenure being on the Hearst Forest SFL. Our overlapping agreement with the Hearst Forest Management Inc. grants us rights to an annual allowable cut (AAC) of 311,417 cubic meters of timber that is Forest Stewardship Council® (FSC®) certified."	
Atlantic Power LP (Calstock)	Hearst, ON	Forest Processing Facility [Biomass generation facility, combustion of wood waste)	N	Operations ongoing for foreseeable future		The Facility creates steam from the combustion of wood waste in a boiler and waste heat from TransCanada's nearby compressor station. Power is generated using one 41 megawatt (MW) Alstom steam turbine-driven generator. The wood waste is burned in a Foster Wheeler boiler with the flue gases from the boiler treated in a cyclone separator and an electrostatic precipitator that removes the majority of the unburned carbon and particulates before the gases enter the atmosphere. The Facility uses a cooling tower to condense process steam for reuse in the power generation cycle. Calstock has a maximum processing capacity of 320,000 GMT/yr. of wood waste. Residual wood ash from the Facility is disposed of in a dedicated ash landfill located on the eastern portion of the property.	

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Rayonier A.M. Canada G.P.	Chapleau, ON	Forest Processing Facility	Z	Operations ongoing for foreseeable future		Annual Softwood Production Capacity of 135 million board feet.  Total annual production capacity of Biomass (may include blends of sawdust, shavings, and screen fines (negotiable)) is close to one million bdmt (bone dry metric tons).  The Martel Forest and Algoma Forest supply conifer fibre to RYAM Lumber's sawmill in Chapleau.	
Levesque Plywood Limited	Hearst, ON	Forest Processing Facility	N	Operations ongoing for foreseeable future	A T	Products: Panels, hardwood plywood, particleboard, plastic laminated	
Lachance Saw and Planer	Val Côté, ON	Forest Processing Facility	N	Operations ongoing for foreseeable future	A T	Products: Custom lumber, mining boxes, flooring, siding, trims	

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Hornepayne Power Inc.	Hornepayne, ON	Forest Processing Facility	N	In operation since 2014		The Cogeneration Plant is a biomass fuel-fired cogeneration facility located adjacent to the lumber manufacturing facilities of the Hornepayne Lumber Company. The facility has a total nameplate capacity of 15.0 MW, of which 8.0 MW is contracted to the Ontario Power Authority. In addition to electricity production, the plant provides steam to the mill for lumber drying and space heating purposes. The plant consumes 175,000 to 200,000 tonnes of sawmill wood byproducts annually.  The company harvests a mix of trees, approximately 50% of which is processed into manufactured lumber. The other 50% becomes by-product residuals and waste streams that are collectively called "residuals" and have significant value in their energy potential.  While the power plant primarily uses hog fuel and dry shavings from our sawmill facilities, Hornepayne Power will continue to look to the most cost-efficient supply for operation. This may include lower-value residuals from nearby sawmill operations and potentially in-forest residues (tree tops, branches, and low-grade logs damaged by insects or disease,) left behind in the harvesting process.	
Hornepayne Lumber Ltd.	Hornepayne, ON	Forest Processing Facility	N	Operations ongoing for foreseeable future		The Hornepayne sawmill complex is located within the Nagagami Forest, a mixed wood site of nearly 4,500 square kilometers in the Boreal Forest Region.  The company's objective is to produce approximately 100 million board feet of FSC certified Random Length.	

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Alamos Island Gold Mine	Dubreuilville, ON	Gold Mine	N	Anticipated mining operations until at least 2035		Island gold's water is from the Maskinonge Lake.  Based on the results of field surveys conducted in 2015 and 2016, a total of 17 fish species are known to occur in the lakes and streams near the Project mine sites  2018: At Island Gold, three oil spills (a total of 1,083 litres spilled) were contained, cleaned and reported to authorities.	
Rayonier A.M. Canada G.P.	Cochrane, ON	Forest Processing Facility	N	Operations ongoing for foreseeable future		The Romeo Malette Forest and Abitibi River Forest supply conifer fibre to RYAM Lumber's sawmill in Cochrane.  Annual Softwood Production Capacity of 160 million board feet.  Total annual production capacity of Biomass (may include blends of sawdust, shavings, and screen fines (negotiable)) is close to one million bdmt (bone dry metric tons)	
Northern Empire Mill	Municipality of Greenstone	Former gold milling site; contains industrial sewage works servicing the site's tailings management area	N	Gold mining/milling was intermittent from 1930s-early 2000s. Currently non-operational, and undergoing monitoring/maintenance	Te	Goldstone Resources Inc. owns a non-operational asset referred to as the Northern Empire Mill located in the Municipality of Greenstone.  At the site there is an industrial sewage works servicing the site's tailings management area, which is governed by a ministry approval issued in July 2010.	April 26, 2021: Fined \$5000 plus \$1250 victim fine surcharge for failing to perform technical inspections of all containment dams and spillways associated with sewage works and preparing Containment Dams Reports as per ministry approval.

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Aggregate Sites (Generally)	Throughout the North Shore of Lake Ontario	Aggregate Extraction	Y	Varies per project		Aggregate sites across the Thunder Bay District extract varying amounts of aggregate each year—some excavating less than 10,000 tonnes of aggregate per year, while others are permitted to extract over 100,000 tonnes of aggregates each year.  Aggregate pits and quarries can result in streambeds and wetlands being altered both before and during extraction, as a drop in the water table means that these habitats will change or cease to exist. (Gravel Watch Ontario)  During both the extraction period and post-extraction, " the changed landscape can allow the infiltration of pollutants into groundwater which will have impacts on seeps, springs, and other outflows as well as downstream communities of plant, animal and human species." (Gravel Watch Ontario)  In 2020, the Province of Ontario approved a number of changes to 0. Reg 244/97 under the Aggregate Resources Act (ARA), including amendment which would "reduce red tape for the Aggregates industry." It is worth noting that " Many typical ARA licence conditions are generic boilerplate provisions that do not necessarily provide adequate site-specific protection of the environment or nearby residents." (CELA)	May 14, 2021: The Hockenhull Land and Cattle Company of Thunder Bay pleaded guilty to excavating Crown land [located near Kashabowie Lake**], removing soil and aggregate and depositing a layer of fine stone or gravel on Crown land.  The company pleaded guilty to charges under the Public Lands Act and was fined \$5,000. It also pleaded guilty to charges under the Aggregate Resources Act and was fined \$10,000.

#### Notes

<sup>\*</sup> Industrial sites that are no longer operating, i.e., mines that are in the closure/remediation phase contribute to terrestrial habitat loss since the restoration of the mining site could take several decades to be restored to the habitat's original (or similar) state prior to the industry's operations. Furthermore, inactive industrial sites may still pose threats to water quality during the remediation phase.

<sup>\*\*</sup> Kashabowie Lake is located on the west edge of the map, approximately 100 km away from the City of Thunder Bay (and is within the Lake Superior Watershed)

# Preamble References

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