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**Ontario Geological Survey
Open File Report 6418**

**Report of Activities, 2024
Resident Geologist Program**

**Timmins Regional Resident Geologist
Report: Timmins and Sault Ste. Marie
Districts**

2025

ONTARIO GEOLOGICAL SURVEY

Open File Report 6418

Report of Activities, 2024
Resident Geologist Program

Timmins Regional Resident Geologist Report:
Timmins and Sault Ste. Marie Districts

by

V. D'Angelo, B.K. Maity, P. Bousquet, S.L.K. Hinz, A.D. McEachern, G. Meyer, N. Sabiri
and V. Gagnon-Coderre

2025

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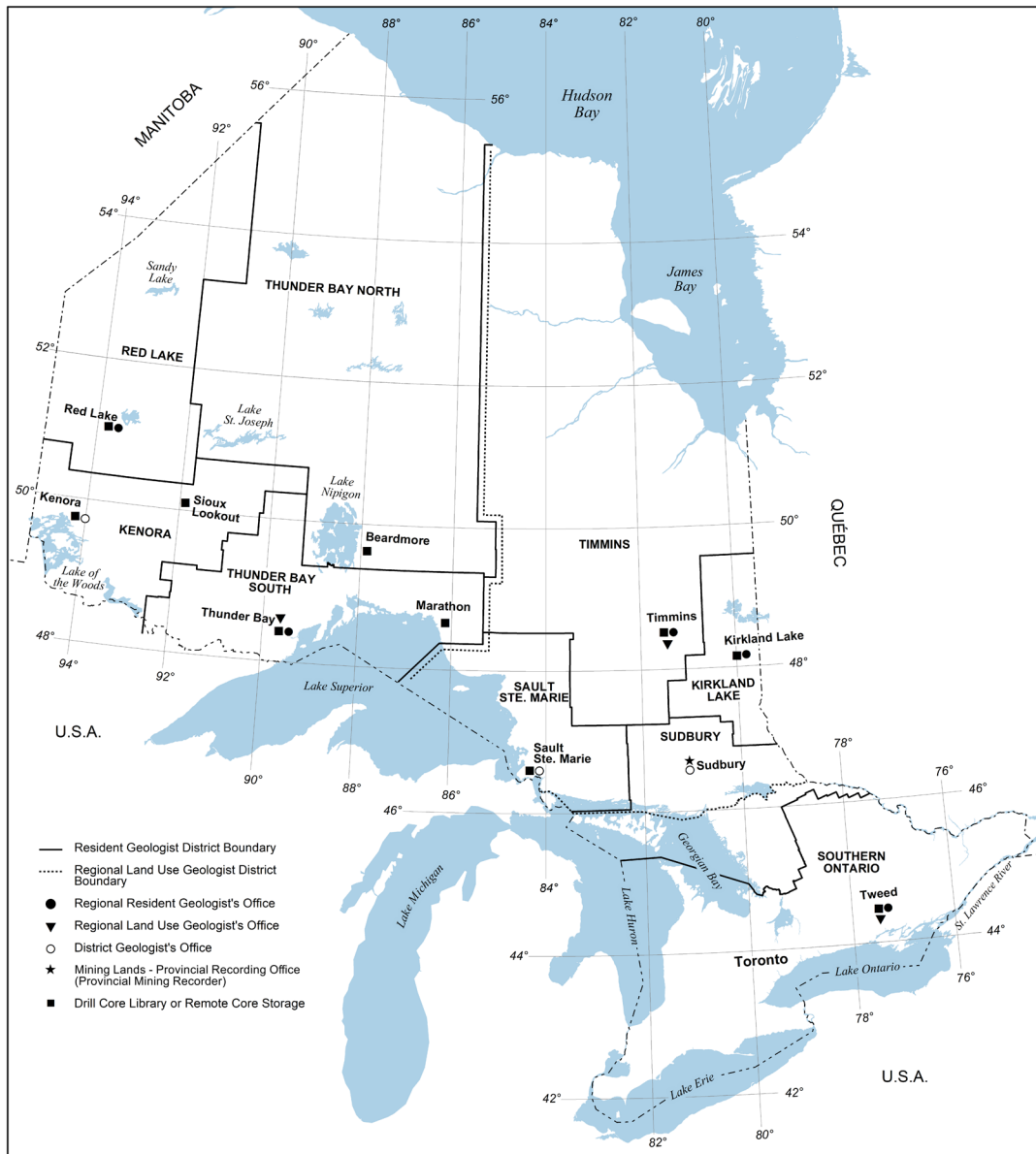
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**ONTARIO GEOLOGICAL SURVEY
RESIDENT GEOLOGIST PROGRAM
REPORT OF ACTIVITIES—2024**

**TIMMINS
REGIONAL RESIDENT GEOLOGIST REPORT**

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2. Sault Ste. Marie District



Ontario Geological Survey Resident Geologist Program

**Timmins and Sault Ste. Marie Regional Resident Geologist
(Timmins District)—2024**

by

**V. D'Angelo, V. Gagnon-Coderre, P. Bousquet, S.L.K. Hinz, N. Sabiri,
G. Meyer and A.D. McEachern**

2025

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Timmins Regional Resident Geologist (Timmins District)—2024

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INTRODUCTION

The Timmins Resident Geologist District extends in the north from the coast of Hudson Bay down southward just past the community of Gogama (Figure 1). It is bordered to the east by the Kirkland Lake Resident Geologist District, to the west by the Thunder Bay North and Thunder Bay South districts, and to the south by the Sault Ste. Marie and Sudbury districts. In 2024, the primary commodity being mined in the district was gold, with a total of 7 producing gold mines. Additionally, the Timmins District has 1 base metal and silver mine (Kidd Mine) and 1 industrial minerals mine (talc; Penhorwood) (Figure 2; Table 1). Four advanced exploration projects (Figure 3; Table 8) and 29 early exploration projects (Figure 4; Table 8) saw activity in the Timmins District in 2024.

There were a number of sales, mergers and acquisitions in the Timmins District in 2024 and early 2025. Silver Lake Resources Ltd., and Red 5 Ltd., completed a merger of equals, creating Vault Minerals. VR Resources sold the Hecla-Kilmer property to Neotech Metals Corp. Aston Minerals announced a merger with Torque Metals Ltd. Canada Nickel Company and Noble Mineral Exploration Inc. announced the creation of a spin-off (“ExploreCo”) to consolidate their interests in large-tonnage, low-grade nickel projects east of Timmins. Newmont Corporation entered into an agreement to sell its Porcupine Operations to Discovery Silver Corp. early in 2025, with the sale expected to close in the first quarter of the year.

Gold prices began the year trading at US\$2065.45 per ounce and ended the year at US\$2625.35 per ounce, peaking at its highest value of US\$2784.42 per ounce on October 30, 2024. The lowest gold price occurred on February 14, 2024, when it traded at US\$1989.30 per ounce. The price of gold rose overall through the course of the year and maintained a value above US\$2500 per ounce from September 10 through the end of the year (Figure 5; www.spglobal.com/en/).

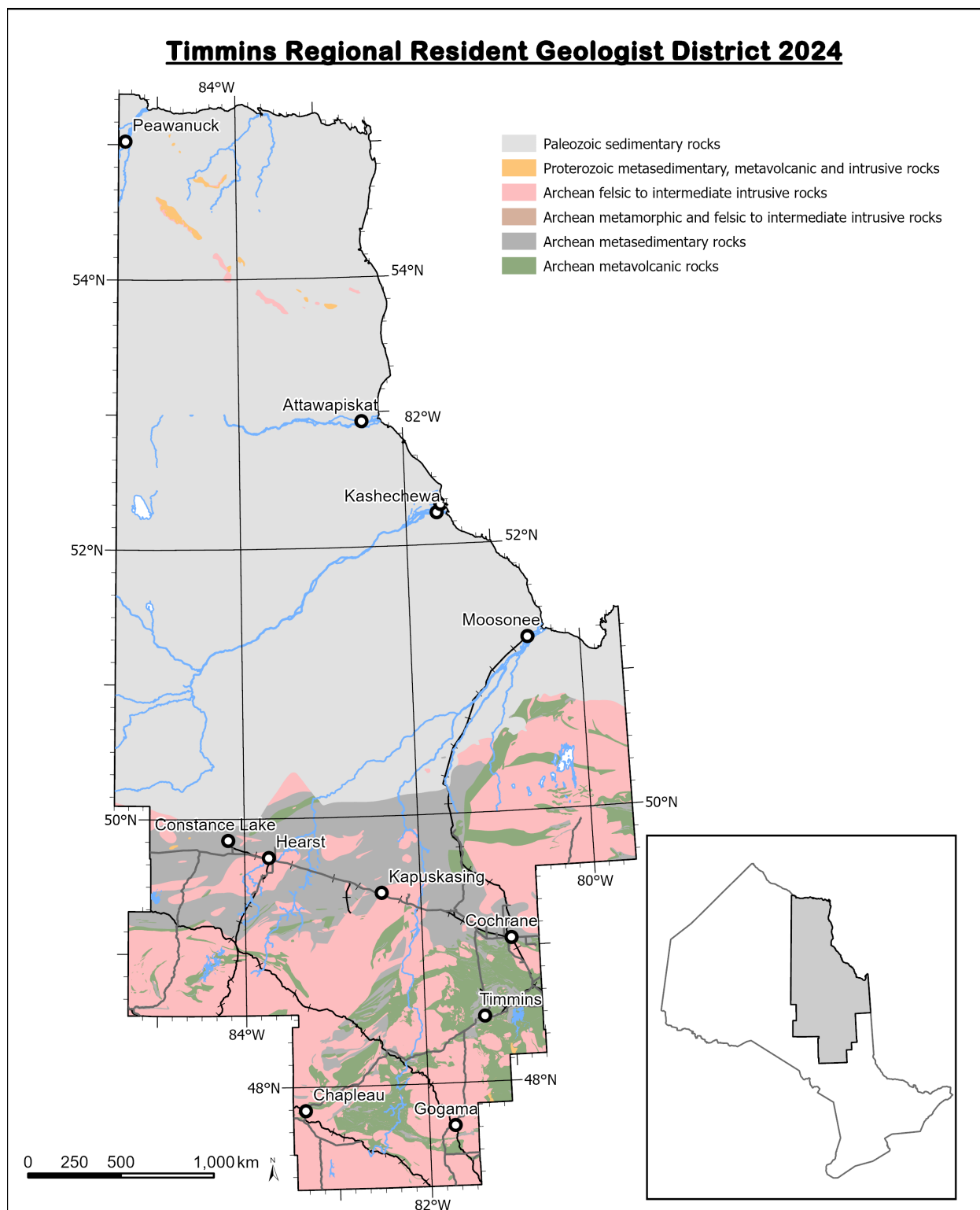


Figure 1. The geology and administrative boundary of the Timmins Resident Geologist District, 2024. Bedrock geology from Ontario Geological Survey (2011).

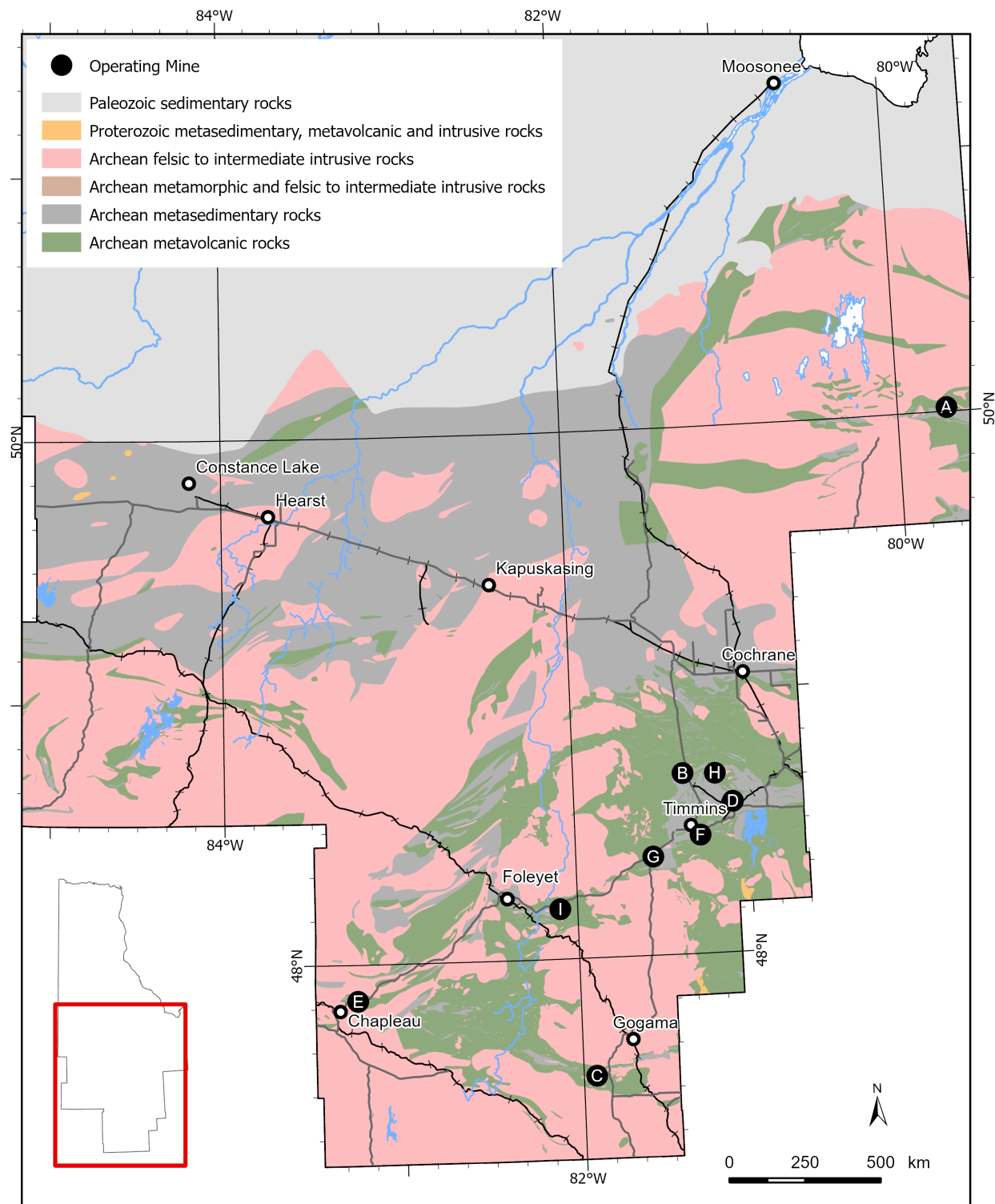


Figure 2. Producing mines in the Timmins District in 2024. Letters are keyed to Table 1 (see “Mining Activity”). Bedrock geology from Ontario Geological Survey (2011).

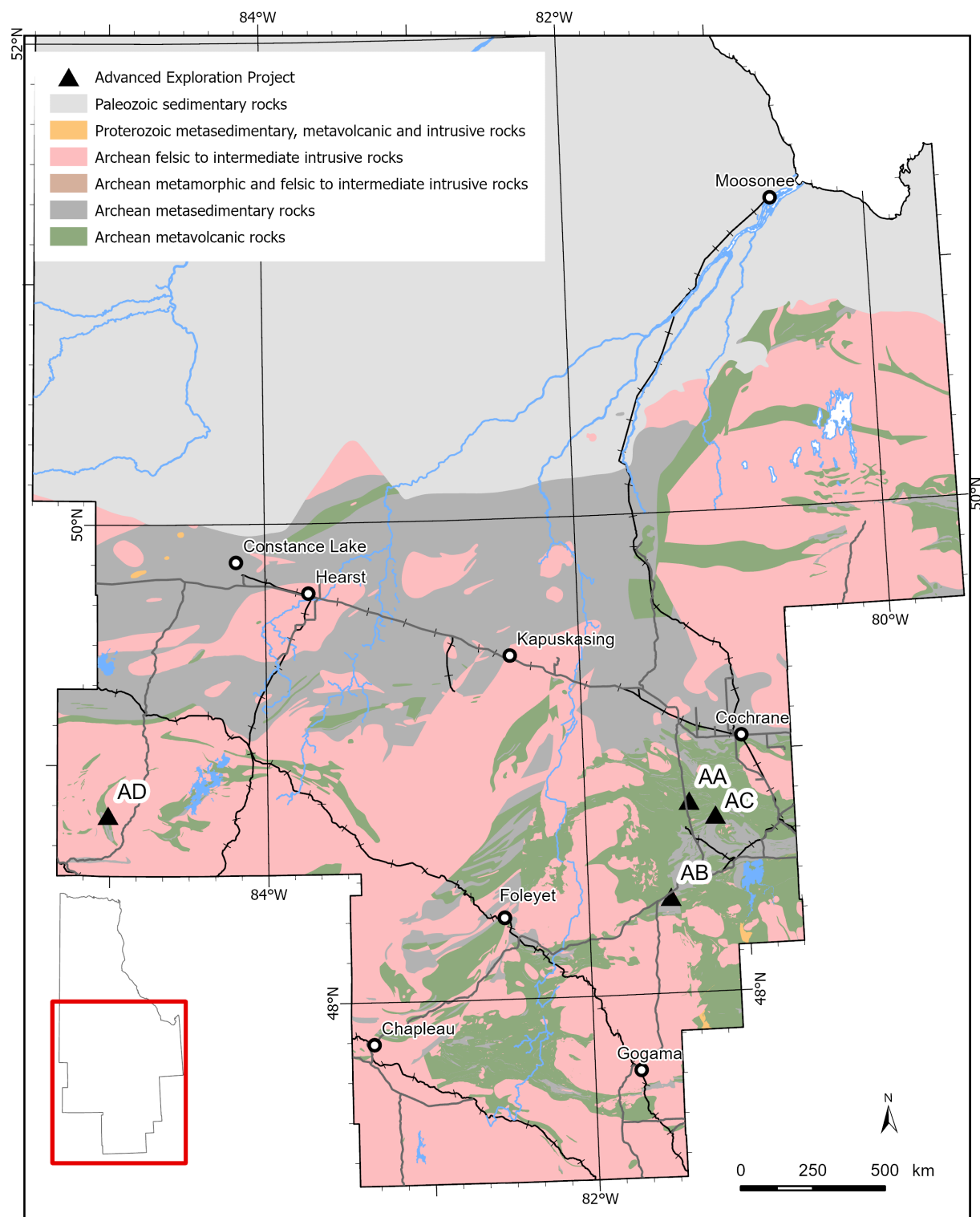


Figure 3. Advanced exploration projects in the Timmins Regional Resident Geologist District that saw activity in 2024. Double letters are keyed to Table 8 (see “Exploration Activity”). Bedrock geology from Ontario Geological Survey (2011).

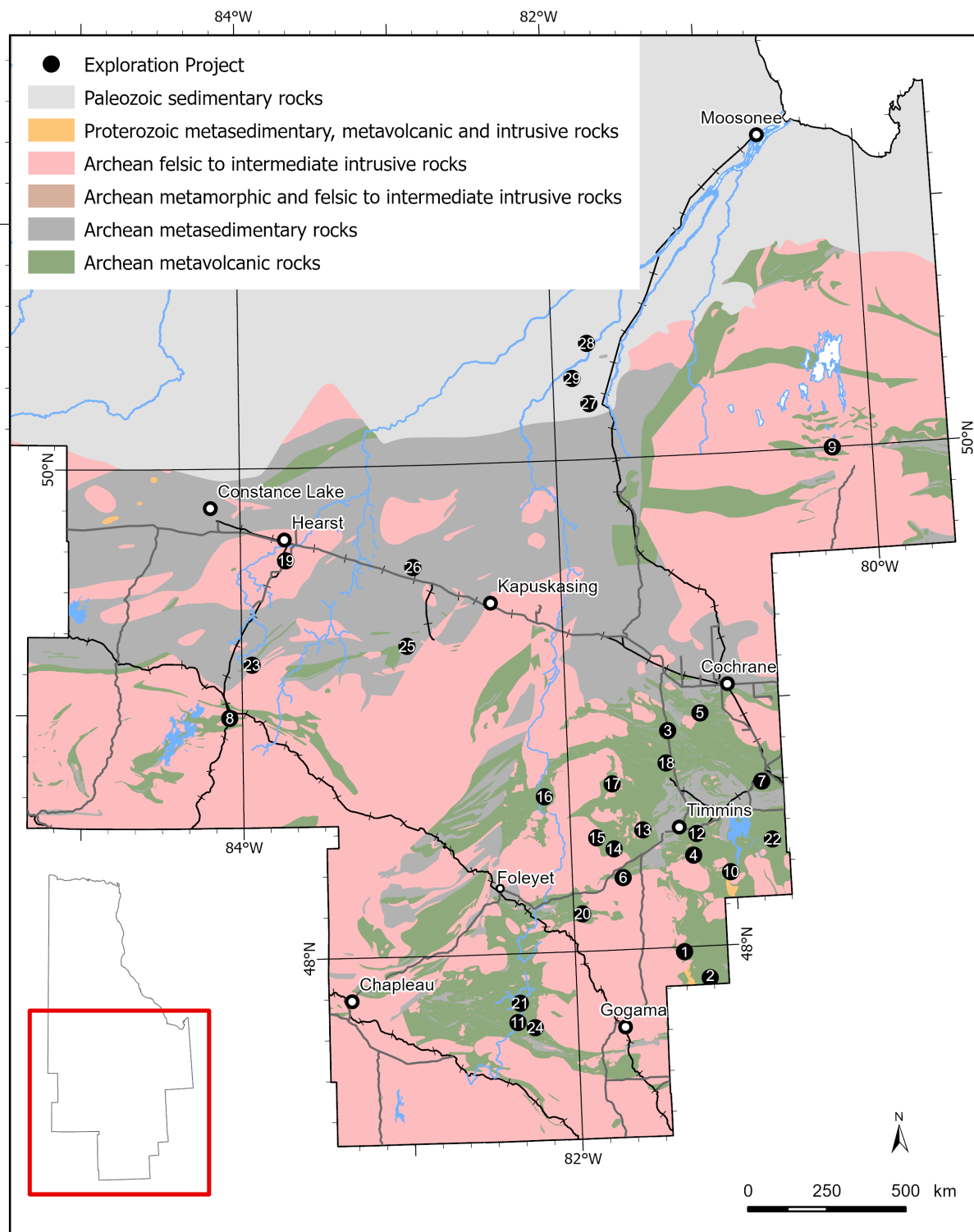


Figure 4. Exploration programs in the Timmins Resident Geologist District that saw activity in 2024. Numbers are keyed to Table 8 (see “Exploration Activity”). Bedrock geology from Ontario Geological Survey (2011).



Figure 5. Gold prices throughout 2024. Data from www.spglobal.com/en/.

MINING ACTIVITY

There were 7 producing gold mines, 1 base metal and silver mine and 1 industrial minerals mine operating in the Timmins District in 2024. Combined, the mines produced a total of 1 278 646 oz gold, 15 000 ounces Ag, 18 300 tonnes copper in concentrates, 1.343 million ounces of silver in concentrate, 37 000 tonnes zinc in concentrates, and 271 354 mt (metric tons) talc. A summary of 2024 production is tabulated below in Table 1, and historical production for the Timmins District up to 2024 is tabulated in Table 2 (historical gold production) and Table 3 (historical base metals and diamond production).

Table 1. Total production values and mineral reserves for mines within the Timmins District in 2024. Letters in first column keyed to Figure 2.

	Company	Mine	Production in 2024		Reserves (Proven + Probable) as of 2024	
			Tonnage at Grade	Total Commodity	Tonnage Grade	Contained Commodity
A	Agnico Eagle Mines Limited	Detour Lake Mine	27 462 000 t at 0.85 g/t Au	671 950 oz Au	795 000 000 t at 0.75 g/t Au	19 100 000 oz Au
B	Glencore Canada	Kidd Mine	1 410 000 t at 2.84% Zn, 2.23% Cu, 76 Ag	37.0 kt Zn*, 18.3 t Cu*, 1.343 Moz Ag*	3 497 000 t	1.40% Cu, 3.44% Zn, 0.14% Pb, 42 g/t Ag
C	Newmont Corporation	Hoyle Pond	222 000 t at 10.8 g/t	73 000 oz Au	**34 900 000 t at 2.09 g/t Au	**2 300 000 oz Au
D	Newmont Corporation	Hollinger	2 010 000 t at 1.35 g/t Au	79 000 oz Au		
E	Newmont Corporation	Borden	666 000 t at 6.54 g/t	130 000 oz Au		
F	Magris Performance Materials	Penhorwood	1 216 000 mt at 22% talc	271 354 mt talc	3 400 000 mt talc	

Company		Mine	Production in 2024		Reserves (Proven + Probable) as of 2024	
			Tonnage at Grade	Total Commodity	Tonnage Grade	Contained Commodity
G	Pan American Silver	Bell Creek Mine	578 562 t at 2.78 g/t Au	48 899 oz Au 15 000 oz Ag [^]	Timmins Operations: 5 400 000 Mt at 2.79 g/t Au (proven) and 4 400 000 Mt at 2.74 g/t Au (probable)	Timmins Operations: 867 600 oz Au
H		Timmins West Mine	1 016 256 t at 2.4 g/t Au	74 797 oz Au		
I	IAMGOLD	Côte Gold	3 637 000 t at 1.34 g/t Au	199 000 oz Au	229 175 000 t at 1.00 g/t Au	7 341 000 oz Au

* commodity in concentrate; **values reported are totals for Porcupine Operations (Hoyle Pond + Hollinger + Borden mines)

[^] value reported is for total Timmins Operations (Bell Creek and Timmins West mines)

Table 2. Historical gold production from mines within the Timmins District to December 31, 2024.

Mine	Township	Years of Production	Total Milled (Tons)	Total Milled (Tonnes)	Production (oz Au)	Grade ¹ (oz/t)
Ankerite (March)	Deloro	1926–1935	317 769	288 275	61 039	0.19
Aquarius	Macklem	1984, 1988–1989	139 634	126 674	27 117	0.19
Aunor (Pamour #3)	Deloro	1940–1984	8 482 174	7 694 899	2 502 214	0.29
Banner	Whitney	1927–1928, 1933, 1935	315	286	670	2.13
Bell Creek	Hoyle	1987–1991, 1992–1994	576 017	522 554	112 739	0.20
Bell Creek	Hoyle	2011–2023	6 922 021	6 279 552	687 546	0.10
Bonetal	Whitney	1941–1951	352 254	319 559	51 510	0.15
Bonwhit	Whitney	1951–1954	200 555	181 940	67 940	0.34
Borden	Cochrane	2018–2024	3 741 490	3 394 223	644 432	0.22
Broulan Porcupine	Whitney	1939–1953	1 146 059	1 039 687	243 757	0.21
Broulan Reef Mine	Whitney	1915–1965	2 144 507	1 945 464	498 932	0.23
Brown–McDade	Denton	1982	1038	942	145	0.16
Buffalo Ankerite	Deloro	1926–1953, 1978	4 993 929	4 530 416	957 292	0.19
Carshaw	Shaw	1983–1984	100 000	90 718	20 500	0.23
Cincinnati	Deloro	1914, 1922–1924	3200	2903	736	0.23
Clavos	Stock	2005–2007	188 743	171 225	24 609	0.13
Clavos	Stock	2017–2018	37 438	33 963	2164	0.06
Concordia	Deloro	1935	230	209	16	0.07
Coniarum (Carium)	Tisdale	1913–1918, 1928–1961	4 464 006	4 049 678	1 109 574	0.25
Côte Gold	Chester	2024	2 681 923	2 433 000	199 000	0.05
Crown (Hollinger)	Tisdale	1913–1921	226 180	205 187	138 330	0.61
Davidson–Tisdale	Tisdale	1918–1920, 1988	53 221	48 218	9739	0.18
Delnite	Deloro	1937–1964	3 847 364	3 490 270	920 404	0.24
Delnite (Open Pit)	Deloro	1987–1988	56 067	50 863	3602	0.06
DeSantis	Ogden	1933, 1939–1942, 1961–1964	196 928	178 650	35 842	0.18
Detour Lake ²	Sunday Lake area	1983–1999	17 643 085	16 005 538	1 781 858	0.10
Detour Lake ²	Sunday Lake area	2013–2024	285 605 553	259 097 000	7 011 796	0.03
Dome (incl stockpile)	Tisdale	1910–2019	119 065 098	108 014 169	16 655 432	0.14

TIMMINS DISTRICT—2024

Mine	Township	Years of Production	Total Milled (Tons)	Total Milled (Tonnes)	Production (oz Au)	Grade ¹ (oz/t)
Faymar	Deloro	1940–1942	119 181	108 119	21 851	0.18
Fuller (Vedron)	Tisdale	1940–1944	44 028	39 942	6566	0.15
Gillies Lake	Tisdale	1921–1931, 1935–1937	54 502	49 443	15 278	0.28
Goldhawk	Cody	1947	636	577	53	0.08
Goldhawk (open pit)	Cody	1980	40 000	36 287	3967	0.10
Halcrow–Swayze ³	Halcrow	1935	211	191	40	0.19
Hallnor (Pamour #2)	Whitney	1938–1968, 1981	4 226 419	3 834 143	1 645 892	0.39
Hollinger	Tisdale	1910–1968	65 778 234	59 673 011	19 327 691	0.29
Hollinger (Pamour Timmins)	Tisdale	1976–1988	2 615 866	2 373 074	182 058	0.07
Hollinger	Tisdale	2014–2024	25 864 873	23 464 218	905 806	0.05
Hoyle (Falconbridge)	Whitney	1941–1944, 1946–1949	725 494	658 157	71 843	0.10
Hoyle Pond	Hoyle	1985–2024	12 879 308	11 683 912	4 434 213	0.28
Hugh–Pam	Whitney	1926, 1948–1965	636 751	577 651	119 604	0.19
Jerome ³	Osway	1941–1943, 1956	335 060	303 961	56 893	0.17
Joburke ³	Keith	1973–1975, 1979–1981	440 117	399 267	43 571	0.10
Kingbridge/Gomak ³	Chester	1935–1936	1387	1258	98	0.07
Marlhill	Hoyle	1989–1991	156 800	142 247	30 924	0.20
McIntyre (Pamour Schumacher)	Tisdale	1912–1988	37 634 691	34 141 618	10 751 941	0.29
(ERG Tailings Recovery)	Tisdale	1988–1989	2 549 189	2 312 585	18 260	0.01
McLaren	Deloro	1933–1937	876	795	201	0.23
Moneta	Tisdale	1938–1943	314 829	285 608	149 250	0.47
Naybob (Kenilworth)	Ogden	1932–1964	304 100	275 875	50 731	0.17
Nighthawk	Macklem	1995–1999	1 479 607	1 342 277	175 803	0.12
Owl Creek	Hoyle	1981–1989	1 984 400	1 800 217	236 880	0.12
Pamour #1 (incl 3,4,7 and Hoyle pits)	Whitney	1936–1999	45 795 863	41 545 308	4 078 525	0.09
Pamour #1 (incl 3,4,7 and Hoyle pits)	Whitney	2005–2011, 2015–2016	19 849 938	18 007 561	741 543	0.04
Pamour (other sources)	Whitney	1936–1999	7 416 634	6 728 257	676 645	0.09
Paymaster	Deloro	1915–1919, 1922–1966	5 607 402	5 086 950	1 192 206	0.21
Porcupine Lake (Hunter)	Whitney	1937–1940, 1944	10 821	9817	1369	0.13
Porcupine Peninsular	Cody	1924–1927, 1940, 1947	99 688	90 435	27 354	0.27
Preston	Tisdale	1938–1968	6 284 405	5 701 116	1 539 355	0.24
Preston NY	Tisdale	1933	2800	2540	153	0.05
Preston (Porcupine Pete)	Deloro	1914–1915	N/A	0	314	N/A
Preston (Porphyry Hill)	Deloro	1913–1915	46	42	312	6.78
Schumacher (Hollinger)	Tisdale	1915–1918	112 124	101 717	27 182	0.27
Stock	Stock	1989–1994, 2000	821 304	745 074	129 856	0.16
Sugar Zone	Odium	2017–2023	1 143 338	1 037 219	200 770	0.21
Timmins West (incl 144 Gap + Thunder Creek)	Bristol	2009–2024	14 188 762	12 871 829	1 425 603	0.10
Tionaga/Smith Thorne ³	Horwood	1938–1939	6653	6036	2299	0.35

Mine	Township	Years of Production	Total Milled (Tons)	Total Milled (Tonnes)	Production (oz Au)	Grade ¹ (oz/t)
Tisdale Ankerite	Tisdale	1952	14 655	13 295	2236	0.15
Tommy Burns/Arcadia	Shaw	1917	21	19	14	0.66
Triple Lake	McArthur	1932	155	141	121	0.78
Vipond (Anglo–Huronian)	Tisdale	1911–1941	1 565 218	1 419 942	414 367	0.26
Young Shannon ³	Chester	1937, 1975	3265	2962	91	0.03
Total			724 340 541	657 110 485	824 803 350	

Notes: ¹Grade: ounce per ton gold; ²Detour Lake greenstone belt; ³Swayze greenstone belt; N/A = data not available. All metric tonnages have been converted to Imperial tons using a conversion factor of 1.1023113. Metric tonnes reported for inactive mines in this table differ from those reported in previous years because the above conversion factor from tons to tonnes was used for all calculations.

Table 3. Historical production of base metals and diamonds in the Timmins District up to December 31, 2024.

Mine	Township	Years of Production	Ore Milled	Grade
Alexo / Kelex	Dundonald, Clergue	1912–1919, 1943–1944 2004–2005	51 857 tons, 4923 tons, 17 398 t	4.5% Ni, 0.55% Cu, 2.3% Ni, 0.23% Cu, 0.07% Co
Canadian Jamieson	Godfrey	1966–1971	816 173 tons	2.44% Cu, 4.22% Zn
Genex	Godfrey	1966	Produced 240 tons Cu concentrate	
Jameland	Jamieson	1969–1972	509 356 tons	0.99% Cu, 0.88% Zn
Kam Kotia	Robb	1943–1944, 1961–1972	6.6 Mt	1.1% Cu, 1.17% Zn, 0.10 oz/t Ag, 0.00085 oz/t Au
Kidd Mine	Kidd	1966–2024	169 802 000 t	2.23% Cu, 5.74% Zn, 0.22% Pb, 76 g/t Ag
Langmuir #1	Langmuir	1990–1991	111 502 tons	1.74% Ni
Langmuir #2	Langmuir	1972–1978	1.1 M tons	1.43% Ni
McIntyre	Tisdale	1963–1982	10 M tons	0.67% Cu
McWatters	Langmuir	2008–2010, 2011–2012	15 361 t, 148 921 t, 153 703 t	0.55% Ni, 0.50% Ni
Montcalm	Montcalm	2004–2009	3 931 610 t	1.25% Ni, 0.67% Cu, 0.051% Co
Redstone	Eldorado	1989–1992, 1995–1996 2006–2008, 2009–2010	294 895 tons, 10 228 tons, 133 295 t, 78 956 t	2.4% Ni, 1.7% Ni, 1.92% Ni, 1.11% Ni
Texmont	Geikie, Bartlett	1971–1972	196 800 tons	0.85% Ni
Victor	BMA 527 834	2008–2019	31 636 t	8355 carats of diamond

Base Metal Mining

GLENCORE CANADA – KIDD OPERATIONS

Kidd Operations (Kidd Mine) is located in Kidd Township, 25 km north of Timmins and is accessible via Highway ON-655 (see B, Figure 2). Mining activity is currently at a depth of 9800 feet (2987 m), with shaft bottom at 9889 feet (3014 m), making Kidd Operations the deepest base-metal mine in the world. In 2024, Glencore's Kidd Operations employed 656 people.

Production in 2024 totaled 1 410 000 tonnes at 2.80% Zn, 1.33 % copper and 40 g/t Ag. As of December 31, resource numbers for Kidd Operations (inclusive of Reserves) stood at 3 497 000 tonnes grading 1.40% Cu, 3.44% Zn, 0.14% Pb and 41 g/t Ag. Reserves were 2 800 000 tonnes grading 1.32% Cu, 3.46% Zn, 0.15% Pb and 42 g/t Ag. Total historical production for the mine is estimated to be 169 802 000 tonnes of ore grading 2.23% Cu, 5.74% Zn, 0.22% Pb and 76 g/t Ag (B. Drolet; personal communication, 2024). Late in the year, Glencore announced that Kidd Operations will cease production at the end of 2026, 60 years after the mine first went into production (Timmins Today, www.timminstoday.com/local-news/date-set-for-closure-of-timmins-kidd-creek-mine-9897842, accessed January 27, 2025).

Gold Mining

NEWMONT CORPORATION – PORCUPINE OPERATIONS

Newmont Corporations' former Porcupine Operations consists of the Hoyle Pond underground operation, the Hollinger open pit, both in Timmins, and the Borden underground operation near Chapleau, Ontario (see C, D and E, respectively, Figure 2). Discovery Silver Corp. announced in early 2025 that it entered into an agreement with Newmont Corporation to acquire the Porcupine Operations for total consideration of USD\$425 million (Discovery Silver Corp., news release, January 27, 2025). Discovery announced the successful acquisition of Porcupine on April 16, 2025 (Discovery Silver Corp., news release, April 16, 2025). Newmont's land package across these 3 operations consisted of 1129 mining claims, 983 mining patents and 113 mining leases for a total area of 137 763 hectares. In 2024, the total production across all 3 mines totaled 284 000 ounces gold from 2 938 000 tonnes with an average head grade of 3.242 gold and a recovery of 92.9X% (Table 4). At the end of 2024, the Porcupine deposits had Reserves and Resources of 34 900 000 tonnes at 2.09 g/t for a total of 2 300 000 oz (Proven and Probable) and 76 600 000 tonnes at 1.59 g/t gold for 3 900 000 oz gold (Measured and Indicated).

Table 4. Production totals from Newmont Porcupine Operations in 2024*.

Mine	Tonnes	Grade (g/t)	Recovered Ounces**
Hoyle Pond	222 000	10.8	73 000
Borden	666 000	6.54	130 000
Hollinger open pit	2 010 000	1.35	79 000

*Data from Discovery Silver Corp. web site: <https://discoverysilver.com/projects/porcupine/porcupine-operations/>, accessed May 8, 2025.

**Recovery for all 3 mine sites averaged 92.9X%

AGNICO EAGLE MINES LIMITED – DETOUR LAKE MINE

The Detour Lake Operation is located about 208 km northeast of Timmins and can be accessed via Highway ON-652 (Detour Mine Road) east of Cochrane (see A, Figure 2). Gold was first discovered at the Detour Lake property in 1974 and mining at the property initially took place between 1983 and 1999 as an open pit and underground mine. Detour Lake currently has a mine life up to the year 2054 and employs 1484 people (Agnico Eagle Limited, www.agnicoeagle.com/English/operations/operations/Detour-Lake-Mine/default.aspx, accessed January 24, 2025). Total production in 2024 was 671 950 000 ounces against a guidance of 690 000 oz gold (Agnico Eagle Mines Limited, news release, February 13, 2025). This represents a 1% decrease compared to 2023 production results of 677 446 oz gold at 0.91 g/t gold.

Agnico Eagle published an updated Life of Mine Plan in 2024 which builds on the 2021 Detour Lake technical report and includes the mine plan update released in 2022. The 2024 technical report revised the open pit mine production profile with updated cost metrics. Additionally, a Preliminary Economic

Assessment was completed for the concurrent operation of the open pit and underground mining project, which have the potential to increase the Detour Lake Mines' production to an average of approximately 1 million ounces of gold a year for 14 years beginning in 2030.

To de-risk the underground project, Agnico Eagle approved a \$100 million investment from 2024 to 2026 to develop an exploration ramp from surface to approximately 270 m depth in order to conduct bulk sampling and infill drilling (Agnico Eagle Mines Limited, news release, June 19, 2024). Preparation work for the excavation of the exploration ramp portal is expected to begin early 2025 (Agnico Eagle Mines Limited, news release, October 30, 2024).

Exploration work at Detour Lake focused on infill drilling into the high-grade corridor of the underground West Pit Zone, as well as infill drilling into the West Extension Zone immediately west of the West Pit mineral resources. In the first 9 months of 2024, Agnico conducted 191 000 m of exploration drilling, with the results expected to strengthen the mineralization model for the underground mine project located west of and under the open pit at Detour Lake (Figure 6).

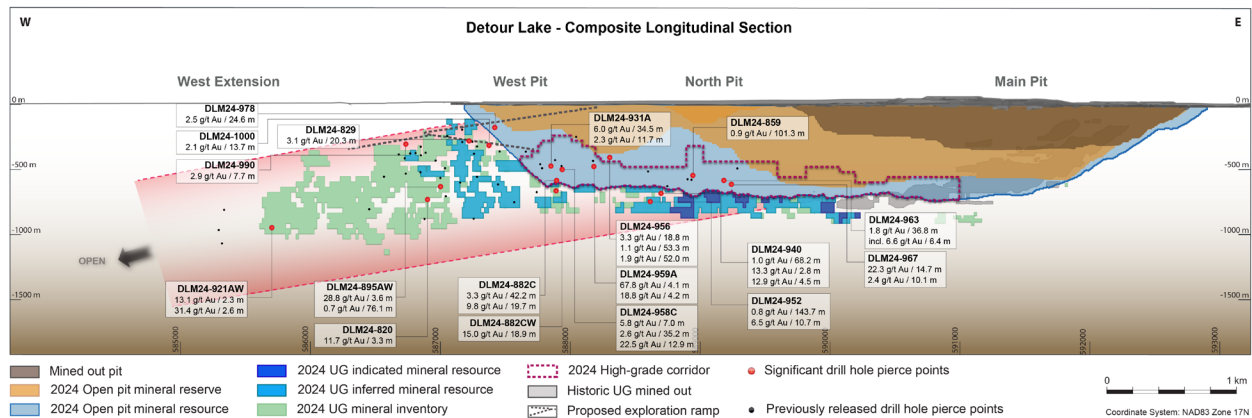


Figure 6. Long section view of Detour Lake open pit with 2024 drilling intercepts (Agnico Eagle Mines Limited, news release, October 30, 2024).

Selected highlights from 2024 West Pit Zone high-grade corridor drilling are (Agnico Eagle Mines Limited, news release, October 30, 2024):

- DLM24-882CW: 18.9 m at 15.0 g/t Au at 573 m depth
- DLM24-958C: 7.0 m at 5.8 g/t Au at 231 m depth; 35.2 m at 2.6 g/t Au at 399 m depth and 12.9 m at 22.5 g/t Au at 490 m depth
- DLM24-931A: 34.5 m at 6.0 g/t Au at 432 m depth and 11.7 m at 2.3 g/t Au at 463 m depth

Selected highlights from the West Extension Zone to the west of current mineral resources are (Agnico Eagle Mines Limited, news release, October 30, 2024):

- DLM24-895AW: 3.6 m at 28.8 g/t Au at 570 m depth
- DLM24-820: 3.3 m at 11.7 g/t Au at 731 m depth

IAMGOLD CORP. – CÔTÉ GOLD DEPOSIT

The Côté Gold deposit is a joint venture between IAMGOLD Corp. and Sumitomo Metal Mining Co., Ltd. The project is located in Chester and Yeo townships (*see* I, Figure 2), approximately 25 km southwest of the town of Gogama. The Côté Project is accessible year-round via Highway ON-144 and sits in an extensive land package covering a total of 596 km² (IAMGOLD Corp., www.iamgold.com/English/operations/cote-gold-project-ontario/default.aspx, website accessed January 24, 2025).

Côté Gold completed its first gold pour on March 31, 2024, and commercial production was announced on August 1. The mine produced 199 000 ounces of gold at 1.37 g/t gold from 4.9 million tonnes of ore during the first 9 months of operation as the site focused on ramp-up following initial production on March 31. In December, the plant operated at 87% capacity over a two-week period as the site moved towards the goal of achieving a throughput rate of 36 000 tonnes per day in the fourth quarter of 2025. As the site is still ramping up, IAMGOLD expects production from the Côté Gold Mine to approximately double in 2025, with a guidance between 360 000 to 400 000 oz gold (IAMGOLD Inc., news release, January 14, 2025).

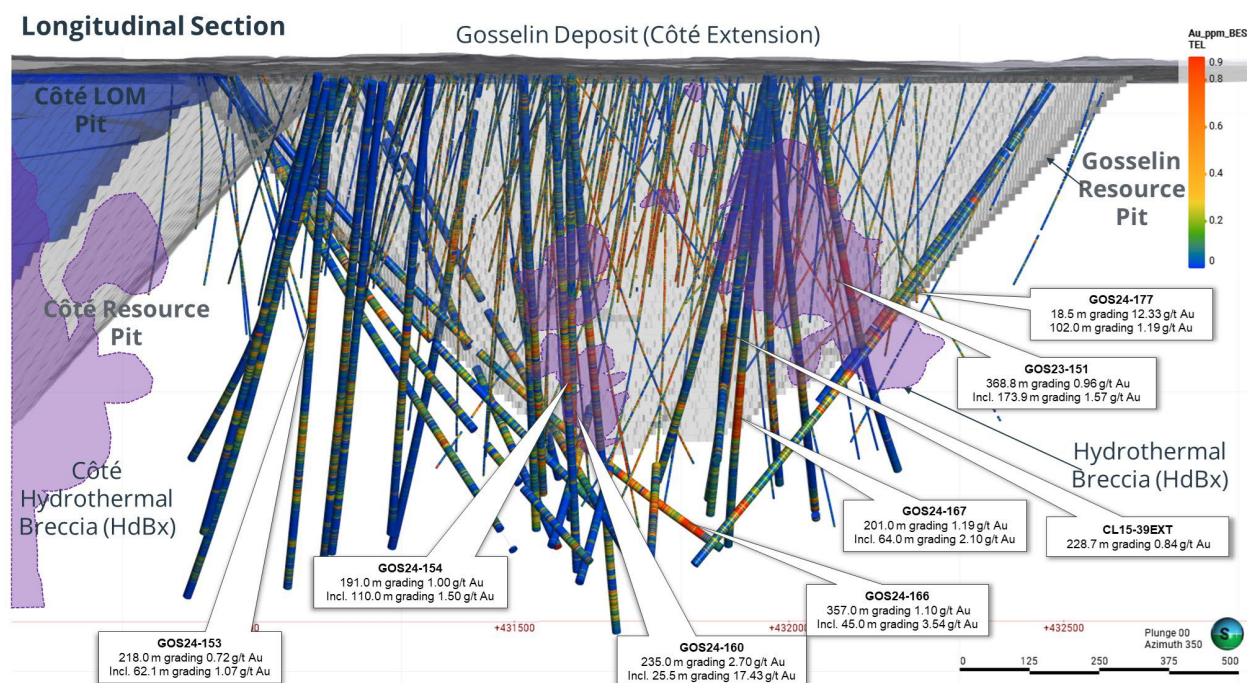


Figure 7. Long section of the Gosselin deposit with 2023 and 2024 drilling intercepts (IAMGOLD Inc., news release, October 15, 2024).

Exploration drilling at the Gosselin Zone outside of the 2023 resource pit shell successfully intersected extensions of Gosselin Zone mineralization both south and west of the Gosselin West Breccia and at depth between the Côté and deposit and Gosselin West Breccia (Figure 7). The 35 000 m drill program was designed to target potential mineralization between the Côté and Gosselin zones, as well as testing the continuity of the mineralized envelope at depth. When combined with the adjacent Côté deposit, gold mineralization between Côté and Gosselin spans approximately 3.2 km in strike length and remains open at depth in all directions (IAMGOLD Inc., news release, October 15, 2024).

PAN AMERICAN SILVER – TIMMINS OPERATIONS

Pan American Silver's Timmins Operation consists of the Bell Creek and Timmins West underground mines and the Bell Creek mill (*see* G and H, respectively, Figure 2). Production results released in January 2025 reported a total combined production of 123 700 ounces of gold and 15 000 ounces of silver from the Timmins operations. Pan American Silver invested \$2.5 million at the Bell Creek site to construct a paste plant and associated infrastructure, construction for which began in October (Pan American Silver, news release, November 5, 2024). As of June 30, 2024, The Timmins Operations had 9.8 million tonnes of gold in Reserve at 2.79 g/t gold (proven) and 2.74 g/t gold (probable) for a combined 867 600 ounces of gold (*see* Table 1).

Pan American Silver advanced its Whitney Project, a joint venture with Newmont Corporation, located 4.5 km south of the Bell Creek processing plant. Between November 2023 and September 2024, Pan American completed 16 941 m of exploration drilling at Whitney. This drilling confirmed current resources at Hallnor/Bonetal (Figure 9) as well as historical resources at Broulan Reef (Figure 8), which were referenced in the 2024 Mineral Reserve and Resource update on June 30th and contained 77 900 ounces of gold in the indicated category and 477 700 ounces of gold in the inferred category (Pan American Silver, news release, December 9, 2024).

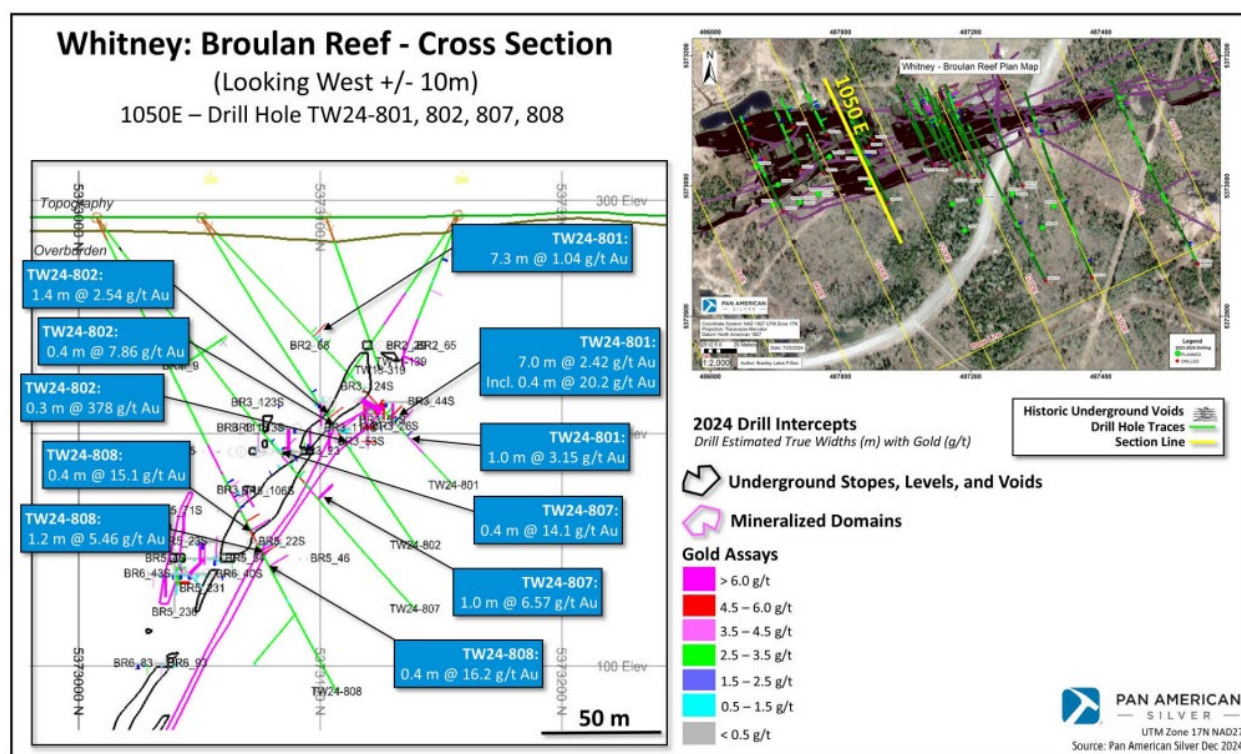


Figure 8. Cross section of the Broulan Reef deposit at Pan American Silver and Newmont's Whitney Project showing 2024 drilling highlights (Pan American Silver, news release, December 9, 2024).

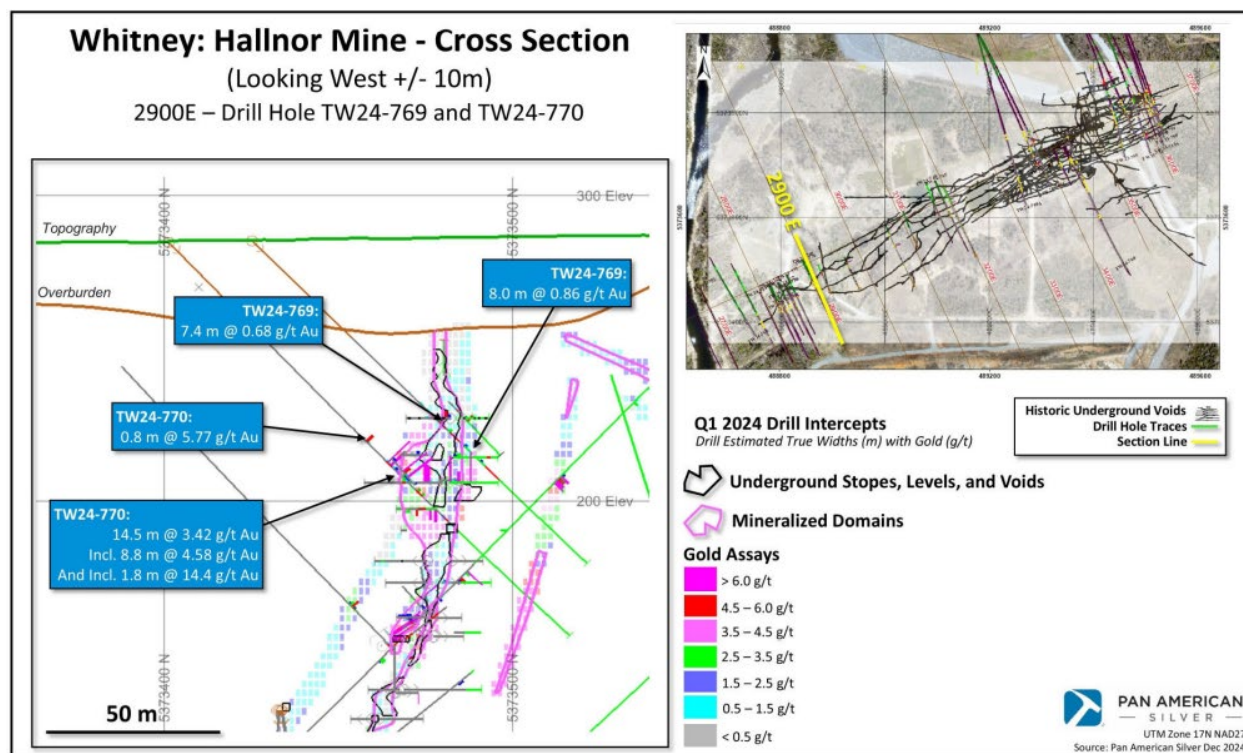


Figure 9. Cross section of the Hallnor deposit at Pan American Silver and Newmont’s Whitney Project showing 2024 drilling highlights (Pan American Silver, news release, December 9, 2024).

Industrial Mineral Mining

MAGRIS INDUSTRIAL MINERALS – PENHORWOOD MINE

Penhorwood Mine, located in Reeves Township, is the only industrial minerals mine in the Timmins District and produced 271 354 metric tons of talc and 945 000 000 tons of waste in 2025. As of 2025, Penhorwood Mine has an approximate 41 years of mine life, with 3 400 000 tons of ore in reserves (Kar, S., personal communication, 2025). There are 76 employees at Penhorwood Mine, 4 direct Magris employees and 72 contract employees through various vendors (Kar, S., personal communication, 2025).

EXPLORATION ACTIVITY

Introduction

Timmins saw a decrease of active claims by 4% in 2024, ending the year with 65 258 fewer hectares covered by claims on December 31 compared to January 4 (*see* Figure 10). At the end of 2024, Timmins had a total of 1 604 545 hectares of area covered by claims, second only to the Thunder Bay North District (Table 5). The value of assessment work filed in 2024 was over C\$12.4 million dollars, a decrease of 78% compared to 2023 (C\$56.5 million) and a decrease of 52% compared to 2022 (C\$26 million) (Table 6). At least 30 individuals or companies held active permits in the District for a minimum of 70 projects, a decrease compared to 2022 (75 individuals held active permits for a minimum of 100 projects). While gold projects still held the majority of active plans and permits in 2024, the District saw a significant increase in exploration activity for base metals, nickel in particular (Tables 6, 7 and 8). There were 29 early exploration projects (*see* Figure 4, Table 8) and 4 advanced exploration projects in the Timmins District (*see* Figure 3) that saw activity in 2024.

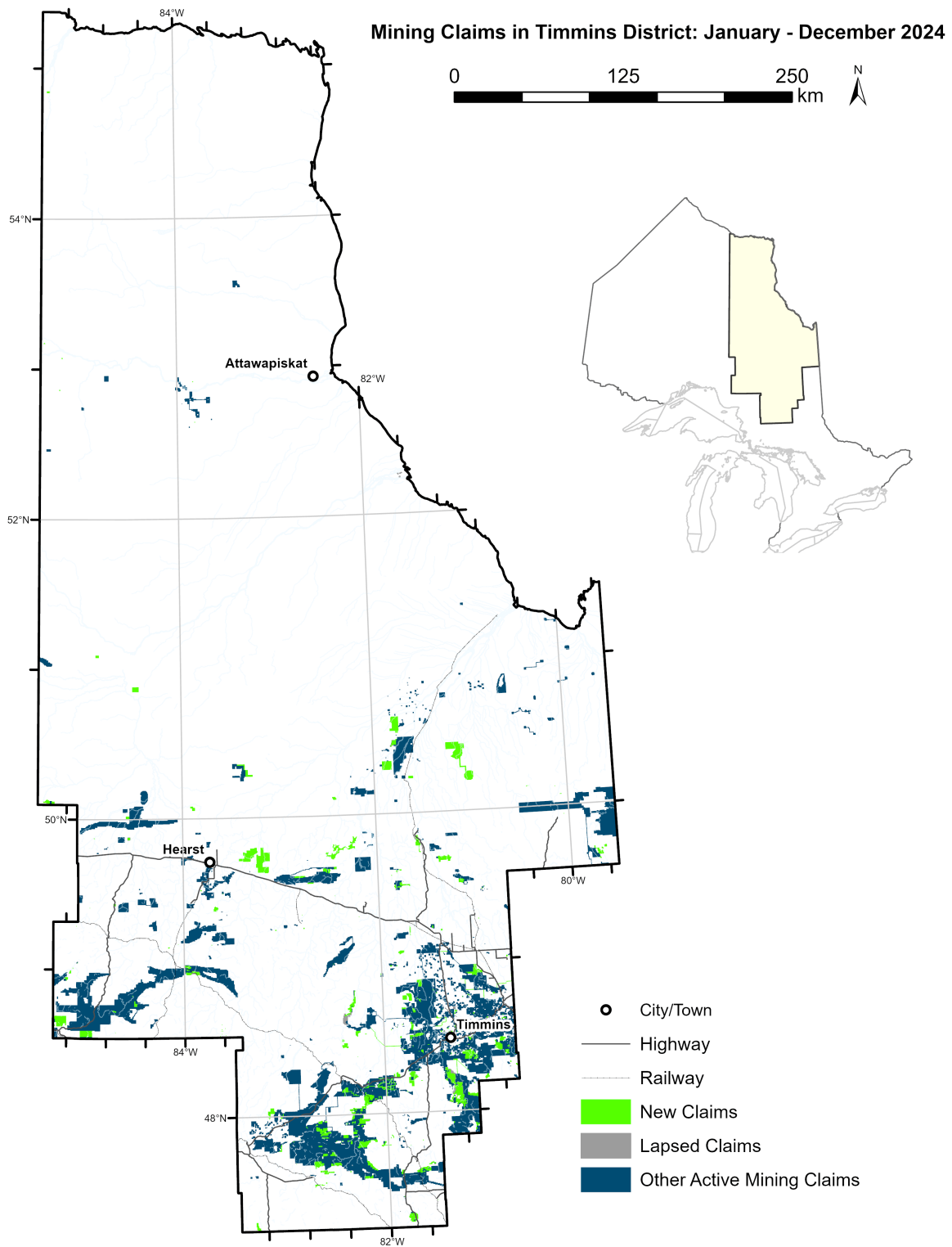


Figure 10. New, lapsed and active mining claims in the Timmins District as of December 31, 2024.

Table 5. Total area covered by claims for each Resident Geologist Program District.

RGP District	Total area (ha) covered by claims December 31, 2024	Total area (ha) covered by claims January 5, 2024	Total area (ha) covered by claims January 4, 2023
Kenora	1 249 561	1 288 204	935 407
Kirkland Lake	1 071 406	1 043 195	1 122 766
Red Lake	1 219 716	1 379 909	1 286 403
Sault Ste Marie	374 473	340 880	98 674
Southern Ontario	103 098	104 114	340 918
Sudbury	395 446	382 723	392 777
Thunder Bay North	2 435 225	2 471 792	1 955 238
Thunder Bay South	1 570 584	1 672 313	1 219 000
Timmins	1 604 545	1 669 803	1 509 378

Table 6. Assessment files received in the Timmins District in 2024 (Ontario Geological Survey 2025).

Abbreviations							
ACOMP	Compilation and interpretation - airborne geophysics	LIDAR	Light detection and ranging survey				
AEM	Airborne electromagnetic survey	MAG	Magnetic / magnetometer survey				
AMAG	Airborne magnetometer survey	MCOMP	Miscellaneous compilation and interpretation				
ASSAY	Assaying and analyses	METAL	Metallurgical testing and bulk sampling				
AVLF	Airborne electromagnetic very low frequency survey	MMI	Mobile Metal Ion™ soil sampling survey				
BEEP	Beep Mat survey	OPET	Other petrographic work				
CHNL	Channel sampling	PDRILL	Diamond drilling				
DHGEO	Downhole geophysics	PHOTO	Air photo and remote imagery interpretations				
EM	Electromagnetic survey	PMAN	Manual labour				
FEAS	Feasibility study	POVERB	Overburden drilling				
GCBIO	Geobotanical and biogeochemical survey	PROSP	Prospecting by licence holder				
GCHEM	Geochemical	PSTRIP	Overburden stripping				
GCOMP	Compilation and interpretation - ground geophysics	RAD	Radiometric survey				
GEOL	Geological survey / mapping	REHAB	Rehabilitation				
GLCOMP	Compilation and interpretation - geology	ROCK	Rock sampling				
IP	Induced polarization	SOIL	Soil/till sampling				
LC	Linecutting	VLF	Electromagnetic very low frequency survey				

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000022356	Horwood	Horwood Exploration Corp.	Horwood Property	2024	ASSAY, PROSP, ROCK	\$23 491	123148, 7225
20000022440	Stock, Beatty, Coulson	GFG Resources Inc.	Goldarm Gold Project	2024	ASSAY, PDRILL	\$802 838	125278, 125279, 125281, 125283, 125285, 7213, 7309, 7310, 7311, 7312
20000022441	Murphy	B.K. Polk	Bigwater Property	2024	MAG	\$7 058	125905, 7330
20000021727	Ogden	International Explorers & Prospectors Inc.	Pine Street Project	2023	ASSAY, PROSP	\$5 266	108973, 6350
20000021733	English	Randall Salo	Beyer-Salo Unconformity Property	2023	ASSAY, PROSP	\$11 030	111353, 6515
20000021735	Murphy	Hermann Daxl	North of Little Goose Lake	2022–2023	ASSAY, PROSP, SOIL	\$17 300	111504, 6526
20000021736	Montcalm	Mink Ventures Corp.	Montcalm Property	2023	ASSAY, PDRILL	\$81 096	111559, 6529

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000022467	Lipton, Ermine, Lipton	Bear Creek Gold Ltd.		2024	MAG	\$84 050	118764, 7005
20000022483	Whitney	Onyx Gold Corp.		2024	ASSAY, PROSP, ROCK	\$6221	122636, 7198
20000022485	Heenan	South Timmins Mining Inc.	Heenan Gold Project	2023	CHNL, PSTRI	\$48 626	122832, 7206
20000022486	Heenan	South Timmins Mining Inc.	Heenan Gold Project	2023–2024	ASSAY, DHGEO, PDRILL	\$164 359	122833, 7207
20000022491	Carter, Middleboro, Whalen, Wigle	Gogama Battery Metals Corp.	Gogama Pegmatite Project	2024	LIDAR	\$22 880	125350, 7315
20000022314	Tooms, Greenlaw	Exiro Minerals Corp.	Sylvanite Project	2022	ASSAY, POVERB, ROCK, SOIL	\$512 656	117241, 6911
20000022430	Dale, Newton	Synergy Metals Corporation	Dale Property	2023	ASSAY, CHNL, PROSP, ROCK, SOIL	\$35 620	122701, 7203
20000022435	Mallard	PTX Metals Inc.	Mallard Gold Property	2023	ASSAY, PROSP, ROCK, SOIL	\$61 541	125764, 7323
20000022399	Ivanhoe, Ivanhoe	GFG Resources Inc.	Pen Gold Project	2022	ASSAY, PDRILL	\$95 956	125188, 7304
20000022400	Stock, Clergue	GFG Resources Inc.	Goldarm Gold Project	2023	ASSAY, PDRILL	\$620 345	125193, 125198, 7305, 7309
20000021706	Inglis	Fred Kiernicki	Firehill LCT Pegmatite - REES Project	2023	ASSAY, CHNL, PROSP, ROCK	\$33 549	111253, 6506
20000022164	Pelletier	Randall Salo	Salo Pegmatite Property	2024	ASSAY, PROSP, ROCK, SOIL	\$6492	118275, 6978
20000021959	Lackner	International Explorers and Prospectors Inc.	Lackner Lake Property	2023	ASSAY, OPET, PROSP, RAD, ROCK	\$19 190	115669, 6807
20000021960	Ottaway, Beck, Lennox, Nesbitt	Fortune Nickel and Gold Inc.	Beck-Ottaway Project	2024	MAG, PROSP, VLF	\$28 450	115744, 6816
20000021976	Massey, Whitesides	2681891 Ontario Inc.	Massey Property	2023	ASSAY, GEOL, PROSP, ROCK	\$26 566	116832, 6889
20000022417	Ogden	Odyssey Explorations Ltd.	Ogden Property	2024	ASSAY, MMI	\$20 784	120837, 7121
20000022073	German	Randall Salo	Salo German Gold Property	2024	PROSP	\$2340	118671, 6997
20000021615	Dargavel	Noble Mineral Exploration Inc.	Dargaval Project	2022	IP, MAG, VLF	\$93 413	105913, 6248
20000021621	Nagagami River Area	Noble Mineral Exploration Inc.	Nagagami Property	2022	ASSAY, PDRILL	\$550 964	109141, 6366
20000021632	Fawn	Ashley Gold Mines Ltd.	Fawn Property	2023	MCOMP	\$2500	110343, 6451
20000022386	Langmuir, Carman	Kraken Gold Corp.	Langmuir Property	2024	FEAS, PMAN	\$7639	124171, 7275
20000021579	Fripp	QLM Exploration Canada Inc.	Quartz Lake Property	2023	PROSP	\$24 042	109248, 6370
20000021581	Newton	Larry Noel Gervais	Newton Property	2023	PHOTO	\$67 186	109345, 6372
20000021582	Dundonald	C. Villeneuve Construction Co Ltd.	Dundonald Property	2023	PHOTO	\$12 592	109348, 6373
20000021592	Fortune, Byers, Cote, Enid	Sanatana Resources Inc.	Fortune Project	2022–2023	ASSAY, SOIL	\$5884	109907, 6426
20000021860	Murphy	Hermann Daxl	South of Bigwater Lake	2020–2023	GCBIO, PROSP	\$30 475	113054, 6620
20000021862	Hogg	VR Resources Ltd.	Northway Project	2022–2023	ASSAY, PDRILL	\$720 051	113624, 6646

TIMMINS DISTRICT—2024

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000021997	Thorburn	Xander Resources Inc.	Timmins Nickel Property	2022–2023	ASSAY, PDRILL, ROCK	\$47 303	110882, 6479
20000021999	Casselman, Fenton, Seaton, Slack, Staples	IAMGOLD Corp.	Saganash Property	2023	ASSAY, MMI, PROSP, SOIL	\$364 958	112007, 112008, 112009, 6576, 6577, 6578
20000022001	Mann, Duff	Canada Nickel Company Inc.	Mann Property	2023	ASSAY, PDRILL	\$1 173 264	113029, 113030, 113031, 6615, 6616, 6617
20000022002	Howells, Mowbray	Trent Potts	Clay Howells Project	2023	ASSAY, PROSP, ROCK	\$18 731	114154, 6716
20000022003	Way, Lowther	Noble Mineral Exploration Inc.	Boulder Project	2023–2024	IP, LC, MAG, VLF	\$121 550	115162, 6780
20000022007	Welsh, Matthews	Fulcrum Metals Inc.	Tocheri Lake Project	2023	ASSAY, PROSP	\$32 793	116593, 6863
20000022008	Foleyet	Enviromine Inc.	Shawmere Anorthosite Project	2022–2023	METAL	\$571 622	116821, 6887
20000022010	Turnbull, Cote, Godfrey, Massey, Robb	Falcon Gold Corp.	Kamiskotia Gabbroic Complex, Kamiskotia Volcanic Complex	2023	MAG	\$43 420	116913, 6892
20000022387	Murphy	International Explorers and Prospectors Inc.	Murphy Property	2024	MMI	\$3570	124606, 7294
20000022389	Whitesides	Mink Ventures Corp.	Warren Property	2024	PROSP, ROCK	\$14 416	124929, 7301
20000021807	Montcalm	Mink Ventures Corp.	Montcalm Property	2023	IP	\$60 442	113081, 6621
20000021808	Dore	2254022 Ontario Ltd.	Dore Gold Project Property	2022	ASSAY, PDRILL	\$70 698	113141, 6624
20000021884	MacDiarmid	Xander Resources Inc.	Timmins Nickel Property, Timmins Nickel South Block	2023	ASSAY, PDRILL	\$140 506	114188, 6719
20000021885	Whitesides	Mink Ventures Corp.	Warren Property	2023	ASSAY, PROSP, ROCK	\$6552	114289, 6721
20000021887	Gowan	Fortune Nickel and Gold Inc.	Gowan Property	2023	GCHEM	\$47 990	114352, 114355, 20000021887, 6724, 6725
20000022455	Carscallen	Hanna Capital Corp.	Carscallen Property	2024	ASSAY, MMI	\$5285	123204, 7227
20000022457	Garnet, Garnet	1537763 Ontario Inc.	Heather Lake Project	2024	PROSP	\$6186	125171, 7303
20000021770	Osway, Esther	Jonathan Camilleri		2023	MAG	\$21 780	112031, 6580
20000022298	German, Dundonald, German	Class 1 Nickel and Technologies Ltd.	Alexo-Dundonald Nickel Property	2020–2021	AEM, ASSAY, EM, PDRILL	\$1 812 520	118882, 7016
20000022255	Dundonald, Evelyn, German	HighGold Mining Inc., Onyx Gold Corp.	Frederick House Lake Project, Golden Mile Property	2022	GEOLOGICAL, GLCOMP	\$76 421	115966, 115967, 115970, 6831, 6832, 6833
20000022263	Hutt	Canada Nickel Company Inc.	Jabba Property	2024	ASSAY, CHNL, GEOL	\$24 463	119833, 7049
20000021717	Murphy		Murphy Township South	2022–2023	ASSAY, PROSP, SOIL	\$14 300	110984, 6491
20000022014	Kidd	Glencore Canada Corp.	Kidd Mine	2019–2023	REHAB	\$147 906	113482, 6639
20000022025	Sheraton	CJP Exploration Inc.	Cross Lake Property	2023–2024	LIDAR, PHOTO, PROSP	\$6408	117156, 6908

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000022029	Whitesides	Mink Ventures Corp.	Warren Property	2024	ASSAY, PDRILL	\$151 507	117407, 6924
20000022034	Benton, Blamey, Cunningham, Dore, Esther, Fawn, Garnet, Heenan, Mallard, Marion	Evolution Mining Exploration and Development Ltd.	October Gold Property	2024	MAG	\$342 620	117548, 117552, 117555, 117558, 117562, 117565, 117677, 117682, 117686, 6937, 6938, 6939, 6940, 6941, 6942, 6954, 6955, 6956
20000022157	Torrance, Clay, Hopkins, Tucker	Kenorland Minerals Ltd.	Torrance Property	2024	ACOMP, AVLF	\$16 962	118831, 118833, 118834, 7008, 7009, 7010
20000022159	Pharand	Joseph Pustina		2023–2024	ASSAY, PROSP, ROCK	\$15 577	116615, 6867
20000022375	Shaw, Eldorado	2628860 Ontario Ltd.	Eldorado Shaw Property	2023–2024	ACOMP, GCOMP, GEOL, PMAN	\$2441	119705, 7039
20000022379	Devitt	C. Villeneuve Construction Co. Ltd.	Devitt Property	2024	LIDAR	\$6500	123655, 7248
20000022495	Tooms, Greenlaw	Exiro Minerals Corp.	Sylvanite Gold Property	2022	ASSAY, CHNL, GEOL, PSTRIIP	\$83 860	121936, 7178
20000021670	Blount	Alain Joseph Gerard Vallee	Vallee Cote Minerals Exploration Project	2023	PROSP	\$3351	110505, 6464
20000021822	Ecclestone	Riverside Resources Inc.	Duc Property	2022–2023	AMAG, ASSAY, PROSP	\$42 492	111494, 6525
20000021829	Yeo, Chester	IAMGOLD Corp.	Clam Lake Property	2021–2023	ASSAY, PDRILL	\$1 187 713	112321, 6594
20000021839	Raney	Rockridge Resources Ltd.	Raney Gold Project	2023	ASSAY, PDRILL	\$477 402	113911, 6689
20000022107	Tully, Prosser	Gowest Gold Ltd.	Bradshaw Gold Deposit, North Timmins Project, Frankfield Property	2023	ASSAY, PDRILL	\$892 231	115812, 6822
20000022115	Lackner	Maurice Labelle		2023	ASSAY, ROCK	\$14 489	117033, 6897
20000022118	Fripp	Hermann Daxl	Splitrock River Property	2023–2024	ASSAY, BEEP, PROSP, ROCK, SOIL	\$31 850	117344, 6922
20000021664	Wilhelmina, Geary	Norbert Reichert	Deliverance Project	2023	PROSP	\$11 219	113100, 6623
20000022124	Agate	Nortec Minerals Corp.	Mattagami River Zinc Project	2024	MAG	\$29 340	118702, 7000
20000021763	McCowan	Goldenfire Minerals Inc.	McCowan Property	2023	ASSAY, PROSP	\$7912	111542, 6528

Other abbreviations: REE, rare earth elements.

Table 7. Active exploration plans and permits in the Timmins District in 2024.

Plan or Permit Number	Holder	Project Name	Township
PR-21-000344	Ursa Major Minerals Incorporated	P-4 Ext	Baldwin, Porter
PR-21-000349	Brian Wright	Janes Property	Janes
PR-21-000350	Randy Stewart	Janes Property	Janes
PR-21-000381	Ursa Major Minerals Incorporated	Shakespeare Island permit	Shakespeare
PR-22-000013	Inventus Mining Corp.	Rathbun Lake	Rathburn
PR-22-000017	John Brady	North River	Fraleck, Parkin

Plan or Permit Number	Holder	Project Name	Township
PR-22-000019	Conquest Resources Limited	Belfast-TeckMag	Afton
PR-22-000023	Allstone Quarry Products Inc.	Allstone Lease Quarry	Bigwood
PR-22-000076	Jim Melo	Allstone Quarry	Bigwood
PR-22-000089	Macdonald Mines Exploration Ltd.	Rathbun	Rathburn, Scadding
PR-22-000090	Macdonald Mines Exploration Ltd.	Powerline	Scadding, Street
PR-22-000091	Macdonald Mines Exploration Ltd.	Jovan-Limestone	Davis
PR-22-000153	Gordon Salo	Sudbury Prospecting Project	Dieppe, Hansen, Truman
PR-22-000154	Gordon Salo	Sudbury Prospecting Project	Ed
PR-22-000211	MacDonald Mines Exploration Ltd.	Candore	Davis, Janes
PR-22-000218	Ursa Major Minerals Incorporated	Spanish Ext	Baldwin, Porter
PR-22-000228	Gordon Salo	Sudbury Prospecting	Truman
PR-22-000308	Macdonald Mines Exploration Ltd.	Scadding	Scadding
PR-22-000318	Glencore Canada Corporation	Norman West	Capreol, Norman, Wisner
PL-22-000132	Glencore Canada Corporation	Chicago Project	Drury
PL-22-000133	Vale Canada Limited Vale Canada Limited	Chicago Project	Drury
PR-23-000016	Inventus Mining Corp.	Sudbury 2.0	Rathbun
PR-23-000017	Inventus Mining Corp.	Sudbury 2.0	Rathbun
PL-23-000015	Petrolympic Ltd.	McKinnon Tp. Project	McKinnon
PR-23-000031	EV Minerals Corporation	Jiggy Creek Nickel	Hyman, Naim
PR-23-000032	Archer Exploration Corp.	Parkin Project A	Norman, Parkin
PR-23-000033	Champion Bear Resources Ltd.	Parkin Project B	Parkin
PR-23-000034	Archer Exploration Corp.	Parkin Project C	Parkin
PR-23-000035	Champion Bear Resources Ltd.	Parkin Project D	Parkin
PL-23-000016	Archer Exploration Corp.	Parkin Project E	Parkin
PR-23-000039	Steven Anderson	Chebogan Lake	Field, Grant
PL-23-000022	Inventus Mining Corp.	Boot Lake	Rathbun
PR-23-000075	1311870 Ontario Inc.	Golden Pine	Parkin
PR-23-000076	John Brady	Black Creek - Golden Pine 2023	Hutton, Parkin
PL-23-000028	Archer Exploration Corp.	SN-Ella Project	Norman
PL-23-000032	Vale Canada Limited Vale Canada Limited	SN-Ella Project	Capreol, Norman
PL-23-000033	Vale Canada Limited Vale Canada Limited	SN-Ella Project	Capreol, Norman
PL-23-000034	Vale Canada Limited Vale Canada Limited	SN-Ella Project	Capreol, Norman
PL-23-000035	Vale Canada Limited Vale Canada Limited	SN-Ella Project	Capreol, Norman
PL-23-000036	Glencore Canada Corporation	SN-Ella Project	Capreol, Norman, Wisner
PL-23-000037	Glencore Canada Corporation	SN-Ella Project	Capreol
PL-23-000038	Glencore Canada Corporation	SN-Ella Project	Capreol, Norman
PL-23-000039	Glencore Canada Corporation	Sandcherry Project	Foy, Harty
PL-23-000040	Archer Exploration Corp.	Morgan-Lumsden Project	Bowell, Foy, Morgan
PL-23-000041	Glencore Canada Corporation	Morgan-Lumsden Project	Foy, Morgan
PL-23-000042	Glencore Canada Corporation	Morgan-Lumsden Project	Foy, Morgan
PL-23-000043	Glencore Canada Corporation	Morgan-Lumsden Project	Foy
PL-23-000044	Glencore Canada Corporation	Morgan-Lumsden Project	Foy, Morgan
PL-23-000045	Vale Canada Limited Vale Canada Limited	Morgan-Lumsden Project	Bowell, Foy, Morgan
PR-23-000092	Environmental Tailings Corporation	Glade	Scadding
PR-23-000095	FNX Mining Company Inc.	Warrior	Stull, Valin

Plan or Permit Number	Holder	Project Name	Township
PR-23-000096	FNX Mining Company Inc.	Warrior	McNamara
PL-23-000062	Joerg Kleinboeck	Totten Project	Louise
PL-23-000063	Archer Exploration Corp.	Totten Project	Drury
PL-23-000064	Vale Canada Limited Vale Canada Limited	Totten Project	Denison, Drury, Lorne, Louise
PR-23-000214	Inventus Mining Corp.	Sudbury 2.0	Aylmer, Macklean, Rathbun
PR-23-000225	Steven Anderson	Nairn NW	Nairn
PR-23-000226	Steven Anderson	Niarn Project NE	Lorne
PR-23-000227	Steven Anderson	Nairn Main Project West	Baldwin, Foster, Merritt, Nairn
PR-23-000228	Steven Anderson	Nairn Main Project East	Foster, Lorne, Nairn, Truman
PR-23-000238	MacDonald Mines Exploration Ltd.	Scadding East Renewal	Scadding
PR-23-000243	MacDonald Mines Exploration Ltd.	Alwyn	Rathbun, Scadding
PR-23-000247	Inventus Mining Corp.	Cobalt Hill	Macklean
PR-23-000254	Pavey Ark Minerals Inc.	East Bull	Gerow
PL-23-000074	Osprey Advanced Materials Corp.	Flett Twp Exploration Property	Flett
PL-23-000089	Ursa Major Minerals Incorporated	Shakespeare East 2023	Hyman, Porter
PL-23-000092	Glencore Canada Corporation	Shakespeare West 2023	Shakespeare
PL-23-000093	McFarlane Lake Mining Incorporated	McMillan	Mongowin
PR-23-000298	John Brady	Marble Mountain - Golden Pine	Parkin
PL-23-000096	John Brady	Parkin-Brady	Norman, Parkin
PL-23-000097	1311870 Ontario Inc.	Parkin-1311870	Parkin
PL-23-000098	Premium Nickel Resources Ltd.	Parkin-PN	Norman, Parkin
PR-23-000335	Ursa Major Minerals Incorporated	Hanover	Porter
PR-23-000339	Ursa Major Minerals Incorporated	Palladium Valley	Porter
PR-23-000345	Glencore Canada Corporation	Norman West	Capreol, Norman, Wisner
PR-24-000004	Osprey Advanced Materials Corp.	Titan Project	Angus, Flett
PR-24-000007	Ursa Major Minerals Incorporated	Palladium Valley Extension	Porter
PR-24-000013	Ursa Major Minerals Incorporated	Mag-Grav	Hyman, Porter
PR-24-000014	Ursa Major Minerals Incorporated	Shakespeare	Baldwin, Shakespeare
PL-24-000003	Ursa Major Minerals Incorporated	Shakespeare SE	Baldwin, Shakespeare
PL-24-000012	Gary Mote	Butler	Butler
PL-24-000013	Glencore Canada Corporation	Morgan West Project	Morgan
PL-24-000014	Vale Canada Limited Vale Canada Limited	Morgan West Project	Foy, Morgan
PL-24-000016	Vale Canada Limited Vale Canada Limited	Morgan West Project	Morgan
PL-24-000017	Archer Exploration Corp.	Morgan West Project	Morgan
PL-24-000018	Glencore Canada Corporation	Morgan West Project	Morgan
PL-24-000019	Glencore Canada Corporation	Morgan West Project	Levack, Morgan
PL-24-000020	Glencore Canada Corporation	Morgan West Project	Morgan
PL-24-000021	Glencore Canada Corporation	Morgan West Project	Morgan
PR-24-000069	1039421 Ontario Inc.	Leases Hutton Twp	Hutton, Kitchener
PR-24-000071	Ursa Major Minerals Incorporated	Crowpat Drilling & Stripping	Dunlop, Porter
PL-24-000026	Ursa Major Minerals Incorporated	Crowpat Geophysics	Dunlop, Porter
PL-24-000032	Tyler Neill	TBL	Olinyk
PL-24-000034	5051318 Ontario Corp.	Whitestone	Hagerman, McKenzie
PR-24-000114	Conquest Resources Limited	Belfast-TeckMag	Afton
PR-24-000115	Conquest Resources Limited	Belfast-TeckMag	Afton

Plan or Permit Number	Holder	Project Name	Township
PR-24-000116	Conquest Resources Limited	Belfast-TeckMag	Scholes
PR-24-000117	Conquest Resources Limited	Belfast-TeckMag	Clement, Scholes
PR-24-000136	Ursa Major Minerals Incorporated	P4 & Spanish River	Baldwin, Porter
PR-24-000137	Ursa Major Minerals Incorporated	SW	Shakespeare
PR-24-000138	McFarlane Lake Mining Incorporated	McMillan Mine Exploration Drilling	Mongowin
PR-24-000144	Conquest Resources Limited	Belfast TeckMag	Afton, Scholes
PL-24-000041	Michael Harrison	Nordic Sons Exploration North	Nipissing
PR-24-000193	Conquest Resources Limited	Belfast TeckMag	Afton, Scholes

Table 8. Exploration activity in the Timmins District in 2024, keyed to Figures 3 and 4.

Abbreviations			
AEM	Airborne electromagnetic survey	OPUD	Operational update
AGMNT	Agreement	PDRILL	Diamond drilling
ASSAYR	Assay results	PERCDH	Percussion drilling
CLMREG	Claim registration	PRDUD	Production update
CORPUP	Corporate update	PROPTR	Property transaction
DATA	Database data	RECON	Regional or reconnaissance ground exploration
DRLRES	Drilling results	RRCALC	Reserve/resource calculations
EXPLUD	Exploration update	SOIL	Soil/till sampling
FINANC	Financing	T43101	NI 43-101 report
METAL	Metallurgical testing and bulk sampling		

No.	Company/Individual Property Name	Township/Area (Commodity)	Exploration Activity
1	Aston Minerals Limited <i>Edleston Project</i>	Halliday, Hutt, Moher, Montrose, Nursey, Semple, Sothman, Zavitz (cobalt, gold, nickel)	ASSAYR, DRLRES, EXPLUD, METAL, RRCALC
2	Canada Nickel Company Inc. / Noble Mineral Exploration Inc. <i>Mann Northwest property</i>	Mann, Sothman (nickel, palladium, platinum)	AGMNT, EXPLUD, METAL, PROPTR, DRLRES, PROPTR
3	Canada Nickel Company Inc. <i>Reid Nickel property</i>	Crawford (nickel)	DRLRES, PDRILL
4	Canada Nickel Company Inc. <i>Deloro Nickel property</i>	Deloro (nickel)	ASSAYR, CORPUP, PDRILL, RRCALC
5	Canada Nickel Company Inc. <i>Reaume Nickel property</i>	Reaume (cobalt, copper, nickel)	DRLRES
6	Canadian Silver Hunter Inc. <i>Lost Dog</i>	Denton (gold)	PROPTR
7	Class 1 Nickel and Technologies Inc. <i>Alexo-Dundonald</i>	Dundonald (cobalt, copper, nickel)	EXPLUD, RRCALC, T43101
8	E2Gold Inc. <i>Hawkins Gold</i>	Hawkins (gold)	EXPLUD, FINANC, CORPUP
9	EGR Exploration Ltd. <i>Detour West Gold</i>	Marquis Lake Area, Ministik Creek Area, Newnham Creek Area (gold)	CORPUP, EXPLUD, PERCDH
10	EV Nickel (Shaw-Dome)	Carman, Langmuir (nickel)	CORPUP, EXPLUD, FINANC, PDRILL
11	Fancamp Exploration Ltd. <i>Mallard</i>	Mallard	CORPUP
12	McLaren Resources Inc. <i>Augdome</i>	Tisdale (gold)	AGMNT

No.	Company/Individual Property Name	Township/Area (Commodity)	Exploration Activity
13	Melkior Resources Inc. <i>Genex Au-Cu Project</i>	Godfrey, Whitesides (gold)	AGMNT, PROPTR
14	Melkior Resources Inc. <i>Carscallen Gold</i>	Carscallen, Denton (gold)	AGMNT
15	Mink Ventures Corporation <i>Warren Project</i>	Whitesides (cobalt, copper, nickel)	DATA, DRLRES, EXPLUD, FINANC, PDRILL, PROPTR, RECON
16	Mink Ventures Corporation <i>Montcalm</i>	Belford, Montcalm, Nova, Strachan (cobalt, copper, nickel)	AGMNT, CLMREG, PROPTR
17	Moneta Gold Inc. <i>Loveland Nickel property</i>	Byers, Loveland (nickel)	PROPTR
18	Noble Mineral Exploration Inc. <i>Carnegie</i>	Carnegie (copper, zinc)	DRLRES, PDRILL
19	Noble Mineral Exploration Inc. <i>Boulder Project</i>	Way (copper, gold, lead, palladium, platinum, platinum metals, silver, zinc)	AEM, EXPLUD, PDRILL
20	Pelangio Exploration Inc. <i>Gowan Polymetallic Project</i>	Gowan (gold, silver, zinc)	CORPUP
21	Planet Green Metals Inc. <i>Marion property</i>	Marion (gold)	AGMNT
22	Planet Green Metals Inc. <i>Sheraton property</i>	Sheraton (gold)	AGMNT, CLMREG
23	Power Metals Corp. <i>Pelletier</i>	Franz, Roche, Scholfield, Talbott (cesium, lithium, tantalum)	CLMREG
24	PTX Metals Inc. (Platinex Inc.) <i>Heenan-Mallard</i>	Mallard (gold)	PDRILL
25	Riverside Resources Inc. <i>Duc Project</i>	Ecclestone (gold)	CORPUP, EXPLUD
26	Torr Metals Inc. <i>Filion Gold Project</i>	Idington, McCowan, McCrea, Neely, Nixon, Pearce, Teetzel, Williamson (gold)	ASSAYR, EXPLUD, SOIL
27	VR Resources Ltd. <i>Halfway</i>	Kilmer (copper, gold)	EXPLUD
28	VR Resources Ltd. <i>Northway</i>	Hogg (diamonds)	EXPLUD
29	VR Resources Ltd./Neotech Metals Corp. <i>Hecla-Kilmer</i>	Hecla (rare earth elements)	AGMNT, EXPLUD, OPUD, PROPTR
Advanced Exploration Activity			
AA	Canada Nickel Company Inc. <i>Crawford Ni-Co Project</i>	Crawford (cobalt, copper, nickel, palladium, platinum, platinum metals)	CORPUP, FINANC, OPUD, PDRILL
AB	Galleon Gold Corp. <i>West Cache</i>	Bristol, Ogden (gold)	EXPLUD, METAL, PDRILL
AC	Gowest Gold Ltd. <i>Bradshaw</i>	Tully (gold)	ASSAYR, CORPUP, EXPLUD, FINANC, PDRILL
AD	Silver Lake Resources/Vault Minerals <i>Sugar Zone</i>	Hambleton (gold)	EXPLUD, FINANC, OPUD, PRDUD, PROPTR

Advanced Exploration Projects

CANADA NICKEL COMPANY – CRAWFORD PROJECT

Canada Nickel Company's Crawford Project is located 42 km north of Timmins (*see* Figure 3, AA) and consists of 116 patents, 148 single-cell mining claims and 2 multi-cell mining claims, totaling an area of approximately 9611 hectares. The Crawford Project currently has a resource (Measured and Indicated) of 6.0 million tonnes of nickel across all zones, and an additional 3.7 million tonnes in Inferred Resources (Table 9) and currently has a 41-year mine life (Staples et al. 2023).

Table 9. Crawford Mineral Resources update, effective August 31, 2023 (Canada Nickel Company, news release, November 25, 2023).

Resource category	Tonnage (Mt)	Grade							Contained Metal					
		Ni (%)	Co (%)	Pd (g/t)	Pt (g/t)	Fe (%)	Cr (%)	Bruc (%)	Ni (kt)	Co (kt)	Pd (koz)	Pt (koz)	Fe (Mt)	Cr (kt)
Higher Grade Main Zone														
Proven	208	0.31	0.013	0.027	0.011	6.23	0.60	1.78	641	27	180	74	13	1249
Probable	64	0.29	0.013	0.023	0.012	6.47	0.54	1.98	185	8	47	24	4	348
Measured	253	0.30	0.013	0.027	0.012	6.40	0.59	1.73	770	33	219	96	16.2	1503
Indicated	296	0.28	0.013	0.023	0.012	6.93	0.57	1.36	830	39	218	112	20.5	1694
Inferred	212	0.28	0.013	0.018	0.011	6.91	0.56	1.21	587	28	123	73	14.6	1190
Lower Grade Main Zone														
Proven	213	0.21	0.013	0.011	0.009	6.69	0.58	1.15	445	27	75	58	14	1226
Probable	368	0.18	0.013	0.011	0.009	6.82	0.53	1.03	678	47	133	106	25	1961
Measured	280	0.22	0.013	0.011	0.009	6.89	0.59	1.15	607	37	96	79	19.3	1646
Indicated	698	0.21	0.013	0.011	0.009	7.10	0.57	1.07	1465	92	249	207	49.6	3998
Inferred	1324	0.21	0.013	0.010	0.009	7.20	0.57	0.94	2772	174	420	386	95.4	7544
Higher Grade East Zone														
Proven	375	0.26	0.012	0.014	0.009	5.92	0.64	2.84	965	47	170	112	22	2418
Probable	148	0.25	0.012	0.009	0.007	5.83	0.63	2.87	369	18	44	32	9	926
Measured	394	0.26	0.012	0.015	0.009	5.92	0.65	3.10	1022	49	185	119	23.3	2546
Indicated	300	0.26	0.013	0.011	0.007	5.85	0.63	3.19	774	38	103	69	17.5	1887
Inferred	112	0.26	0.013	0.010	0.007	5.90	0.62	2.89	289	14	37	25	6.6	695
Lower Grade East Zone														
Proven	198	0.15	0.012	0.011	0.011	7.00	0.50	0.32	295	24	73	67	14	998
Probable	141	0.15	0.011	0.012	0.010	6.54	0.47	0.60	212	16	53	46	9	659
Measured	169	0.16	0.013	0.011	0.009	7.25	0.54	0.40	279	21	57	49	12.3	908
Indicated	172	0.17	0.012	0.011	0.009	7.11	0.52	0.93	289	21	61	52	12.2	886
Inferred	45	0.17	0.013	0.010	0.008	7.11	0.54	0.55	78	6	14	12	3.2	244
Total Crawford Resource														
Proven + Probable	1715	0.22	0.013	0.014	0.009	6.44	0.57	1.61	3789	215	777	519	110	9787
Measured+ Indicated	2562	0.24	0.013	0.014	0.010	6.67	0.59	1.69	6035	330	1189	783	170.9	15 066
Inferred	1693	0.22	0.013	0.011	0.009	7.08	0.57	1.09	3726	222	594	496	119.9	9674

Canada Nickel announced a US\$18.5 million investment from Samsung SDI, wherein Samsung SDI received an 8.7% ownership stake in Canada Nickel and rights to a 10% equity interest in the Crawford Project upon a final construction decision (Canada Nickel Company, news release, February 6, 2024). The company, through its subsidiary NetZero Metals, announced its intention to build North America's largest nickel processing facility and Canada's largest stainless-steel production facility in the Timmins District (Canada Nickel Company, news release, February 8, 2024). Canada Nickel awarded engineering contracts for these facilities to SMS group, Metso and Ausenco Engineering Canada in April (Canada Nickel Company, news release, April 17, 2024).

Canada Nickel filed an Impact Statement with the Impact Assessment Agency of Canada on November 22, moving the project into the Indigenous and public consultation phase (Canada Nickel Company, news release, December 10, 2024). The company also released its 2023 Environmental, Social and Governance (ESG) Report which outlines the company's new Exploration Agreements with its First Nations partners, its GHG emissions reductions, its safety record for the year and its contribution to the local communities (Canada Nickel Company, news release, November 4, 2024).

Canada Nickel progressed the Crawford project by beginning the Front End Engineering Design (FEED) stage, aiming for a construction decision by mid-2025 and initial production by 2027. This step in the design phase is part of the company's efforts to de-risk the project to prepare for timely construction once approvals are granted (Canada Nickel Company, news release, April 11, 2024).

Metallurgical testing from the Crawford East Zone Material returned total nickel recoveries of 47% and supported potential for high-grade sulphide concentrate product, with a locked cycle test delivering a 60% nickel concentrate (Canada Nickel Company, news release, July 29, 2024).

Drilling at the platinum group element (PGM) zones for Crawford Main and East Zone boundaries returned positive results, in which platinum (Pt) and palladium (Pd) mineralization were intersected within a transitional boundary between the pyroxenite and peridotite units that overlie the nickel-bearing dunites. The drilling intended to provide enough data for an estimate of the PGM zones to be incorporated into the Crawford nickel mine plan; 28 of the 31 holes were successful in intersecting PGM mineralization. Thirty-one drill holes were completed in 2024 (23 in the East zone and 8 holes in the Main Zone; Figure 11) to target PGM mineralization, as these zones reside within the proposed Crawford open pit boundaries and were considered waste in the current feasibility study (Canada Nickel Company, news release, July 31, 2024).

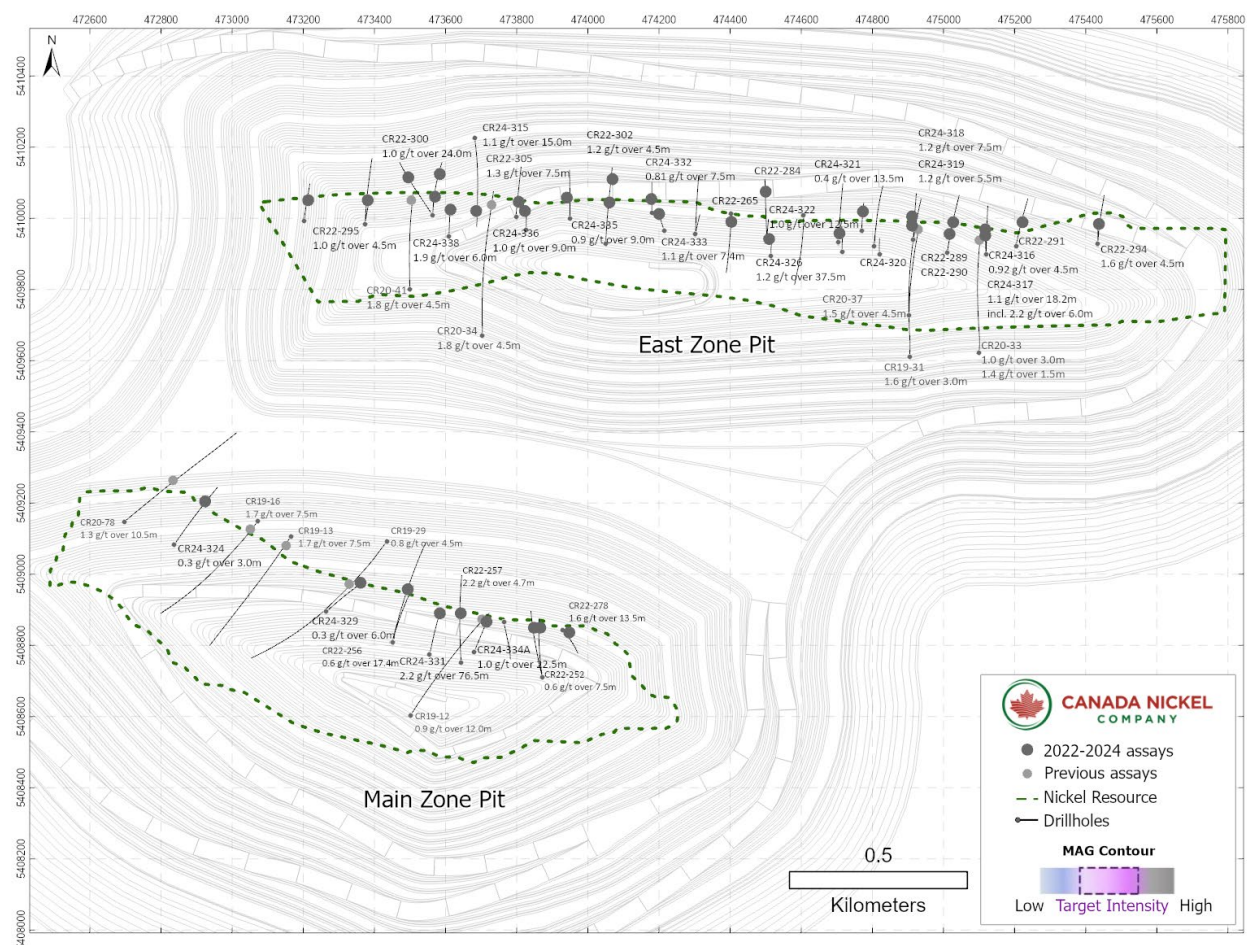


Figure 11. Crawford PGM drilling (Canada Nickel Company, news release, July 31, 2024). Universal Transverse Mercator (UTM) co-ordinates in North American Datum 1983 (NAD83), Zone 17.

Drilling highlights from the 2024 PGM drilling program include the following:

- CR22-272 (Main Zone): 2.9 m (true width) at 1.90 g/t Pt+Pd from 66 m
- CR24-331 (Main Zone): 1.6 m (true width) at 3.90 g/t Pt+Pd from 376.5 m
- CR24-326 (East Zone): 11.9 m (true width) at 1.15 g/t Pt+Pd from 210.5 m

GALLEON GOLD CORP. – WEST CACHE PROJECT

Galleon Gold Corporation's 100% owned West Cache Gold Project, located in Bristol, Price and Ogden Townships, consists of a large land tenure package of 10 370 hectares of mining lease, mining license, patent claims and mining claims. The West Cache Project is accessible via Highway ON-101 and is located 13 km west of Timmins (Figure 3, AB). A Preliminary Economic Assessment was filed for the project in 2022, and the deposit currently has a resource of 472 koz at 3.62 g/t gold in the indicated category and 1088 koz at 2.87 g/t gold in the inferred category (Galleon Gold, <https://galleongold.com/projects/west-cache-gold-project/>, accessed January 22, 2025).

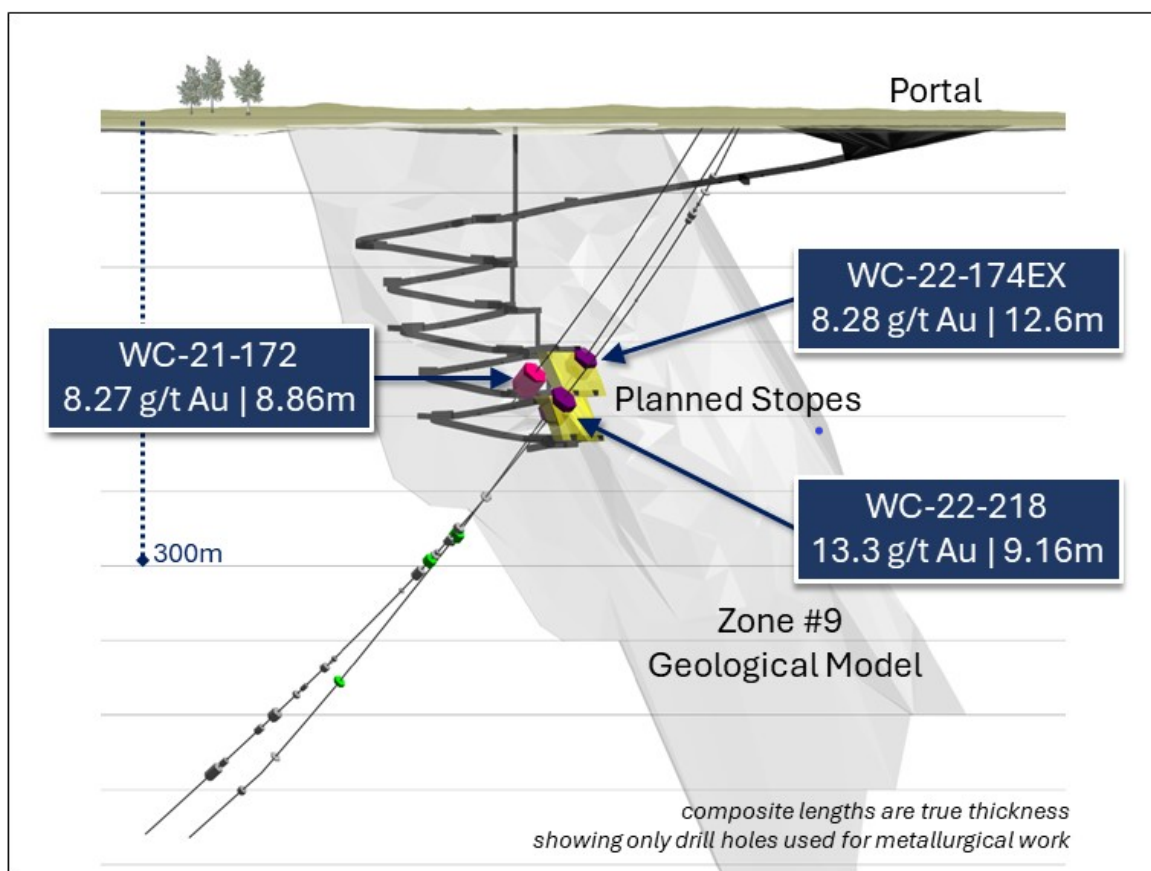


Figure 12. Metallurgical sample locations at West Cache Gold Project (Galleon Gold Corp., news release, April 3, 2024).

Galleon Gold released results from metallurgical test work performed on a composite sample representative of the planned 86 500 tonne exploration bulk sample from the West Cache Project (Figure 12). The study built on previous metallurgical work conducted in 2021 and investigated gold recoveries from flotation and gravity-flotation methods.

The composite sample contained 29 samples from 3 holes drilled into Zone #9, where the planned bulk sample stopes are located. The average fire assay head grade from the sample was 8.90 g/t gold, with a screened metallic grade at 9.26 g/t gold. The testing returned up to 98.5% gold recovery via rougher flotation and up to 97.1% recovery via gravity tailing flotation tests. These results confirm grade composites from infill drilling and resource estimation in the planned bulk sample area (Figure 12) (Galleon Gold Corp., news release, April 3, 2024).

GOWEST GOLD – BRADSHAW GOLD DEPOSIT

The Bradshaw gold deposit is located 32 km north-northeast of the city of Timmins (see Figure 3, AC) within Gowest Gold's North Timmins Gold Project (NTGP) and can be accessed via Highway ON-655 and a 13.5 km long, all-weather gravel road. The Timmins Gold Project consists of 1 patented mining claim, 11 mining leases and 56 unpatented mining claims, with a total area of approximately 109 km². Twenty-six unpatented mining claims are under joint venture with Transition Metals Corp., while Gowest has a 100% interest in all other claims (Gowest Gold, <https://gowestgold.com/north-timmins-gold-project/overview/>, website accessed January 22, 2024).

Gowest completed 12 769 m of diamond drilling at Bradshaw prior to April 30 as part of their Phase 2 surface drilling program at the North Timmins Gold Project. The drilling, part of a \$10 million exploration program, aims to expand the mineable resource at the Bradshaw gold deposit and to further test regional targets within the NTGP area (Gowest Gold, news release, May 13, 2024). Of the 32 completed drill holes reported in May, 19 holes (plus one in progress) were completed on the eastern portion and north of the Bradshaw deposit. The drilling identified 8 new mineralized zones, including the newly discovered HW10 zone, which returned 23.2 g/t gold over 0.6 m (GW24-351A). Five holes (1754 m) were completed at the Roussain zone and returned up to 4.15 g/t gold over 0.6 m. Six holes (2033 m), with an additional one in progress at the time of the news release, were completed at the Sheridan zone (Gowest Gold, news release, May 13, 2024).

In June, Gowest entered into a definitive agreement with a group of existing shareholders to go private (Gowest Gold, news release, June 24, 2024). Security holders approved the transaction (Gowest Gold, news release, September 6, 2024) and the company announced the successful completion on September 20, where the outstanding shares would be delisted from the TSX Venture exchange on or about September 24 (Gowest Gold, news release, September 20, 2024).

VAULT MINERALS – SUGAR ZONE GOLD DEPOSIT

Vault Minerals' Sugar Zone Mine (formerly owned by Silver Lake Resources) is a high-grade mine that produced gold from 2018 to 2023. Mining and processing activities at the mine were idled in August 2023 in order to complete a 93 000 m drilling program (Figure 13), which included the development of 3 dedicated exploration drives (Vault Minerals, <https://vaultminerals.com/operations/sugar-zone>, accessed January 12, 2025). The mine is located approximately 30 km north of White River and can be accessed via Highway ON-631 (Figure 3, AD).

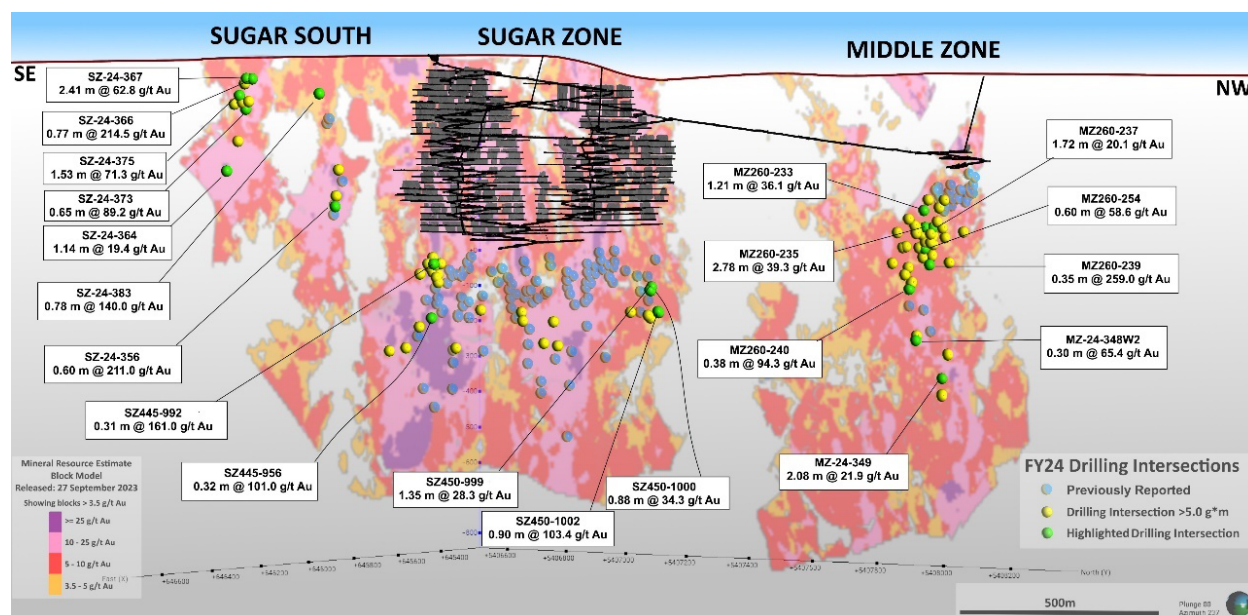


Figure 13. Long section of the Sugar Zone deposit with 2024 drilling highlights (Vault Minerals, <https://vaultminerals.com/operations/sugar-zone>, accessed January 12, 2025).

Silver Lake Resources, which acquired the Sugar Zone mine in 2022, and Red 5 Ltd., completed a merger of equals in August 2024. Subsequently, Vault Minerals has focused on drilling and ore body modelling to build understanding on the structural controls and spatial distribution of mineralization at Sugar Zone (Vault Minerals, <https://vaultminerals.com/operations/sugar-zone>, accessed January 12, 2025). The Sugar Zone deposit has 500 000 ounces of gold in Reserve at 5.5 g/t gold and an estimate 1.2 million ounces of gold as Resource at 8.2 g/t (Table 10).

Table 10. Mineral Resources and Ore Reserves Statement from Vault Minerals for the Sugar Zone Gold Mine, effective June 30, 2024.

Ore Reserves									
	Proven			Probable			Total		
	Tonnes (Mt)	Grade (g/t)	Ounces (koz)	Tonnes (Mt)	Grade (g/t)	Ounces (koz)	Tonnes (Mt)	Grade (g/t)	Ounces (koz)
Sugar Zone				1.94	5.2	325	1.94	5.2	325
Sugar Zone Total	2	5.8	0	2872	5.5	506	2874	5.5	506

Mineral Resources									
	Measured and Indicated			Inferred			Total		
	Tonnes (Mt)	Grade (g/t)	Ounces (koz)	Tonnes (Mt)	Grade (g/t)	Ounces (koz)	Tonnes (Mt)	Grade (g/t)	Ounces (koz)
Sugar Zone Total	2.8	8.5	768	2.03	7.8	510	4.83	8.2	1278

EXPLORATION PROJECTS

Base Metal Exploration Projects

EV NICKEL – SHAW DOME PROJECT

The Shaw Dome Project is located approximately 25 km southwest of the city of Timmins and is accessible year-round by road (*see* Figure 4, no.10). The project consists of 942 mining claims with over 30 000 hectares in area. EV Nickel has 2 main projects on the property: the W4 Project and the CarLang Project (EV Nickel, <https://evnickel.com/project/the-shaw-dome-project/>, website accessed January 15, 2025).

EV Nickel continued to advance its Shaw Dome Project through a systematic and multiphase program consisting of geophysical surveys, metallurgical test work, surface mapping and diamond drilling (EV Nickel, news release, April 16, 2024).

At CarLang, EV Nickel reported assay results from 148 surface samples collected from the CarLang trend in the northeast Shaw Dome Project area. The sampling focused on the CarLang B target (Figure 14), located 2 km from the CarLang A deposit, to identify the spatial distribution of dunites and peridotites along the northwestern arm of the CarLang Trend. Of the 148 samples collected, 123 were of peridotite or dunite. Assay results ranged between 0.15% and 0.34% Ni, and 79% of samples returned results of 0.24% Ni or higher (EV Nickel, news release, June 6, 2024).

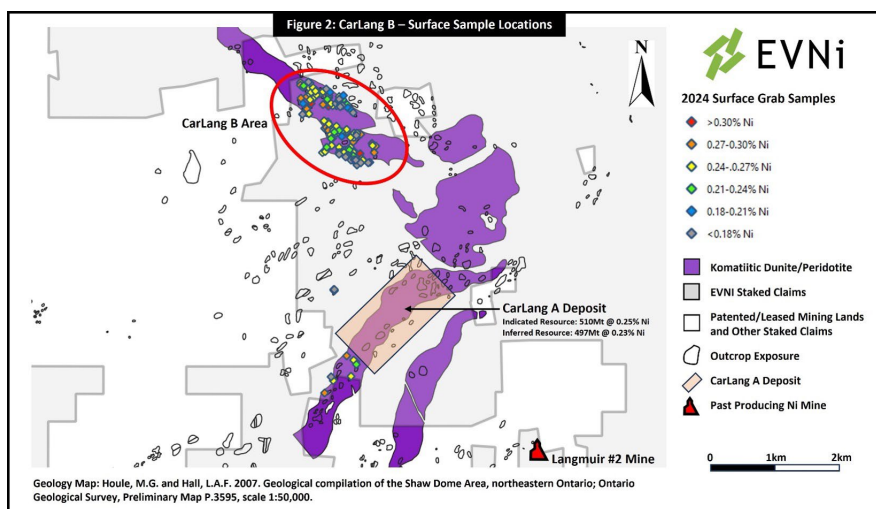


Figure 14. Surface grab samples in the CarLang B area completed by EV Nickel in 2024 (EV Nickel, news release, June 6, 2024).

EV Nickel completed a 10-hole (2568 m) diamond-drilling program on the CarLang B, Gemini (formerly CarLang C Zone) and E zones within the CarLang trend. The Gemini drill results returned the highest nickel grades to date within the CarLang trend. All 10 holes intersected near-surface ultramafic units, comparable to or better than those identified at the CarLang A deposit (EV Nickel, news release, October 8, 2024).

Highlights from the CarLang drilling include the following (results from EV Nickel, news release, October 8, 2024):

- EV24-CAR06: 241 m at 0.30% Ni, including 7.50 m at 0.56 % Ni and 1.5 m at 0.96% Ni
- EV24-CAR08: 234 m at 0.28% Ni, including 37.5 m at 0.37% Ni, 13.50 m at 0.39% Ni and 19.5 m at 0.37% Ni

Mineralogical analysis of the Gemini zone confirmed that the higher-grade drilling results in EV24-CAR08 are associated with nickel sulphides observed in drill core. QEMSCAN (quantitative evaluation of materials by scanning electron microscope) results identified millerite and heazlewoodite as the dominant nickel-bearing sulphides. Electron probe microanalysis analyses showed nickel contents of 64.97% and 72.38% in millerite and heazlewoodite, respectively. Samples also returned an average of 0.19% chalcopyrite and 3.6% brucite by mass. EV Nickel plans to continue exploration on the Gemini North Zone area in 2025 with diamond drilling, geophysical analysis, metallurgical and mineralogical studies (EV Nickel, news release, December 12, 2024).

EV Nickel also conducted diamond drilling to target the down-plunge high-grade nickel mineralization associated with the past-producing Langmuir #2 nickel mine. Assays from the first 4 holes of 2024 revealed grades up to 5.11% Ni in hole EV24-L04 (EV Nickel, news release, September 4, 2024).

CANADA NICKEL – MANN PROPERTY

Canada Nickel Company's Mann property is located 22 km east of the Crawford deposit, between Timmins and Cochrane (Figure 4, no.2), and consists of the Mann North, Mann West, Mann South and Central Zones (Figure 15). The Mann Project is one of the properties that is part of the agreement with Noble Mineral Exploration to create an "ExploreCo" subsidiary. As a result, the Mann project is 80% owned by Canada Nickel Company and 20% owned by Noble Mineral Exploration (Canada Nickel Company, news release, October 31, 2024).

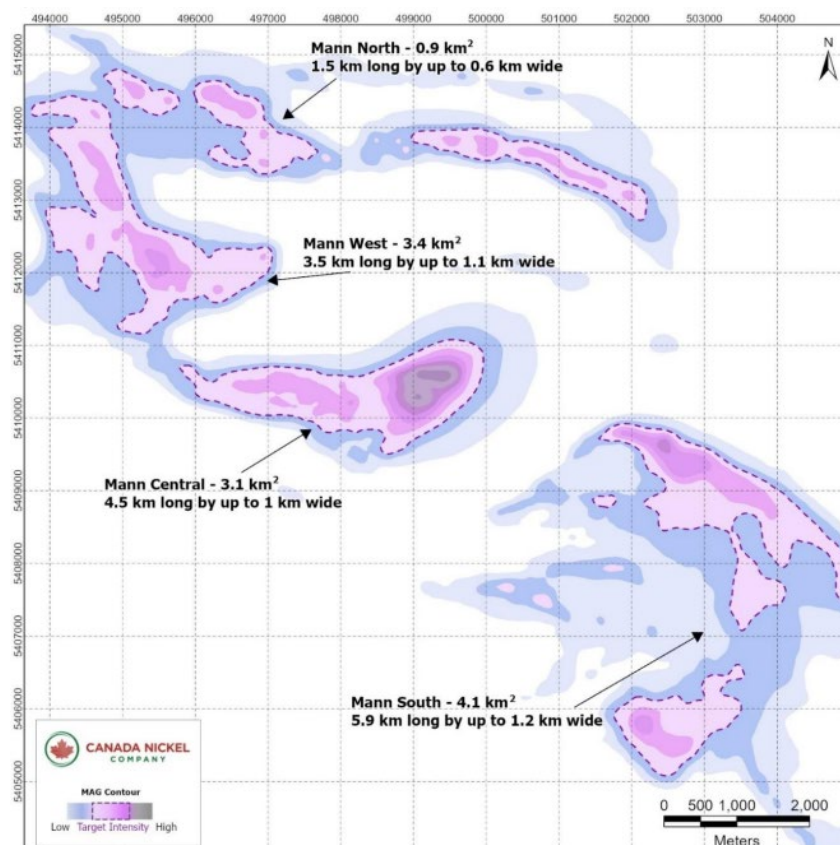


Figure 15. Canada Nickel Company's Mann Project (Canada Nickel Company, news release, December 11, 2024). UTM co-ordinates in NAD83, Zone 17.

In 2024, drilling was conducted at the Mann West, Mann North and Central zones. At Mann West, the focus was on the southern half of the target, with all 40 holes (31 drilled in 2024) intersecting well-serpentinized peridotite and minor dunite with disseminated nickel sulphide (primarily pentlandite and heazlewoodite) mineralization. Thirty-two holes were drilled at Mann Central totalling 11 853 m, all of which intersected varying degrees of mineralized peridotite with minor pyroxenite dikes. Drilling at Mann North consisted of 6315 m over 16 holes, with most intersecting long sections of peridotite and minor dunite, showing nickel grades consistent with the Crawford deposit and anomalous values of platinum and palladium (Canada Nickel Company, news release, October 31, 2024).

In August, drilling at Mann South included 20 holes, all intersecting serpentinized peridotite and dunite. Canada Nickel is currently conducting mineralogical studies on the Mann South samples to identify and prioritize future targets in the area (Canada Nickel Company, news release, December 11, 2024).

CANADA NICKEL – REID PROJECT

Canada Nickel Company's Reid Project, located 16 km southwest of Crawford (Figure 4, no.3), made significant advancement with the publishing of an initial mineral resource this year. The company drilled 32 893 m across 57 drill holes, successfully delineating a mineralized ultramafic unit with a strike length of 2.2 km and a width of 1 km (Canada Nickel Company, news release, October 31, 2024). The 2024 drilling program achieved the best intercept to date at the Reid project, yielding 661.5 m at 0.29% Ni, including 21.5 m at 0.34% Ni and 100.5 m at 0.42% Ni in REI24-35 (Canada Nickel Company, news release, August 8, 2024).

Canada Nickel announced an initial mineral resource for its 100%-owned Reid Nickel Sulphide Project. A total of 26 508 m of drilling from 55 drill holes completed between 2022 and 2024 (Figure 16) were used to calculate the initial resource into 2 resource categories: 0.59 billion tonnes at 0.24% Ni for 1.4 million tonnes of contained nickel in the Indicated category and 0.99 billion tonnes at 0.23% Ni for 2.2 million tonnes of contained nickel in the Inferred category (Table 11). The mineral resource is effective of December 5, 2024, and employs a 0.10% nickel cut-off grade. This initial resource is one of 7 nickel resources that the company intends to publish by mid-2025 (Canada Nickel Company, news release, December 23, 2024).

Table 11. Initial Mineral Resource Estimate for Canada Nickel Company's Reid deposit, effective December 5, 2024.

Domain	Category	Tonnes (Mt)	Ni (%)	Co (%)	Fe (%)	Cr (%)	S (%)	Pd (g/t)	Pt (g/t)
Higher Grade	Indicated	525.6	0.25	0.012	6	0.71	0.048	0.01	0.007
	Inferred	754	0.24	0.012	6.1	0.71	0.05	0.009	0.007
Lower Grade	Indicated	70.2	0.19	0.013	7.3	0.6	0.045	0.014	0.11
	Inferred	233.4	0.19	0.013	7.2	0.59	0.049	0.012	0.1
Total	Indicated	595.7	0.24	0.012	6.2	0.7	0.048	0.01	0.007
	Inferred	987.4	0.23	0.012	6.4	0.68	0.05	0.01	0.008

CANADA NICKEL – DELORO PROJECT

Canada Nickel Company's Deloro project is located 8 km south of Timmins, in Deloro Township (see Figure 4, no.4) and is accessible by road year-round. The property consists of 56 unpatented mining claims and 31 Crown Patents 100% owned by Canada Nickel, for an approximate area of 1005 ha (Jobin-Bevins, Mortimer and Siriuanas 2024).

Canada Nickel Company completed an 11-hole infill drilling program and developed a geological model at Deloro with the intent to update the Maiden Mineral Resource released in 2024. The drilling program expanded the mineralized footprint by 50%. Highlights include DEL2412, which intersected 0.26% Ni over 431 m and DEL24-17, which intersected 0.27% Ni over 293 m (Canada Nickel Company, news release, June 4, 2024).

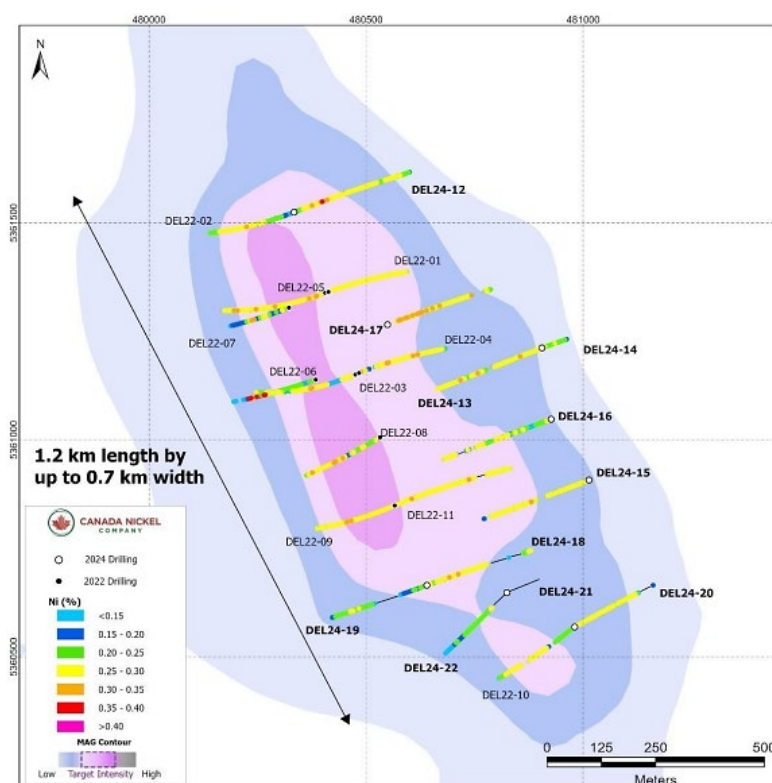


Figure 17. Drilling at the Deloro Project, 2024 (Canada Nickel Company, news release, June 4, 2024). UTM co-ordinates in NAD83, Zone 17.

Canada Nickel published an initial Mineral Resource for its 100%-owned Deloro Nickel Sulphide Project on July 18, 2024. The initial Resource, based on 8242 m of drilling from 22 holes (Canada Nickel Company, news release, July 31, 2024; Figure 17), is effective from July 17 and employs a 0.10% nickel cutoff grade and assumed a nickel price of USD\$21 000/t (NI43-101-compliant). The Deloro deposit, a komatiite-hosted type II nickel-copper-cobalt–platinum group element deposit, contains disseminated and blebby nickel sulphides, primarily pentlandite with minor pyrrhotite and chalcopyrite. The deposit contains an estimated 81.3 Mt of ore at 0.25% Ni in the Indicated Category, for a total of 201.8 kt of nickel and 357.5 Mt of ore at 0.25% Ni in the Inferred Category for a total of 885.4 kt of nickel (Jobin-Bevins, Mortimer and Siriuanas 2024).

Table 12. Deloro deposit pit-constrained Maiden Mineral Resource estimate for Canada Nickel Company’s Deloro Project, effective July 17, 2024.

Classification	Tonnage (Mt)	Ni (%)	Ni (kt)	Co (%)	Co (kt)	Fe (%)	Fe (Mt)	S (%)	S (kt)	Cr (%)	Cr (kt)	Pd (g/t)	Pd (koz)	Pt (g/t)	Pt (koz)
Indicated	81.3	0.25	201.8	0.011	8.6	5.2	4.2	0.056	45.6	0.24	193.6	0.0029	7.7	0.0045	11.8
Inferred	357.5	0.25	885.4	0.011	38	5.2	18.6	0.063	224.9	0.23	835.4	0.004	45.7	0.0053	60.6

MINK VENTURES CORP. – WARREN NICKEL COPPER COBALT PROJECT

The Warren Project is located approximately 35 km west of Timmins (*see* Figure 4, no.15) and consists of 1130 hectares of contiguous patented mining claims and claim sell groups. The Warren Patents are currently under option from Mink (all other claims 100% owned by Mink), who has the ability to earn 100% interest in the property following \$300 000 spent on exploration and an additional 750 000 common shares in MINK (Mink Ventures Corp., <https://minkventures.com/projects/warren-project/overview/>, accessed January 15, 2025).

Mink Ventures completed a 6-hole (507 m) diamond-drilling program at the Warren Copper Nickel Project in early 2024, submitting 144 core samples for analysis (Figure 18, Mink Ventures Corp., news release, February 27, 2024). The drilling focused on the A Zone, targeted as a result of a surface sampling program in 2023 (Mink Ventures Corp., news release, March 31, 2024). The drilling program successfully confirmed correlation between surface geophysical surveys and historical surface sulphide mineralization (Mink Ventures Corp., news release, February 27, 2024). All 6 holes intersected broad zones of sulphide mineralization, with hole W24-4 intersecting what is interpreted to be an extension of the B Zone, extending the strike of it by approximately 75 m beyond the historical trenches (Mink Ventures Corp., news release, February 27, 2024). Results suggest that the A Zone mineralization may have formed as a massive sulphide lens that was fractured by subsequent phases of gabbro. Hole W-24-01 intersected semi-massive sulphides typical of those exposed on surface at the A Zone trenches, returning grades of 0.48% Ni, 0.12% Cu and 0.07% Co over 0.9 m from 21.5 m depth (Mink Ventures Corp., news release, March 31, 2024).

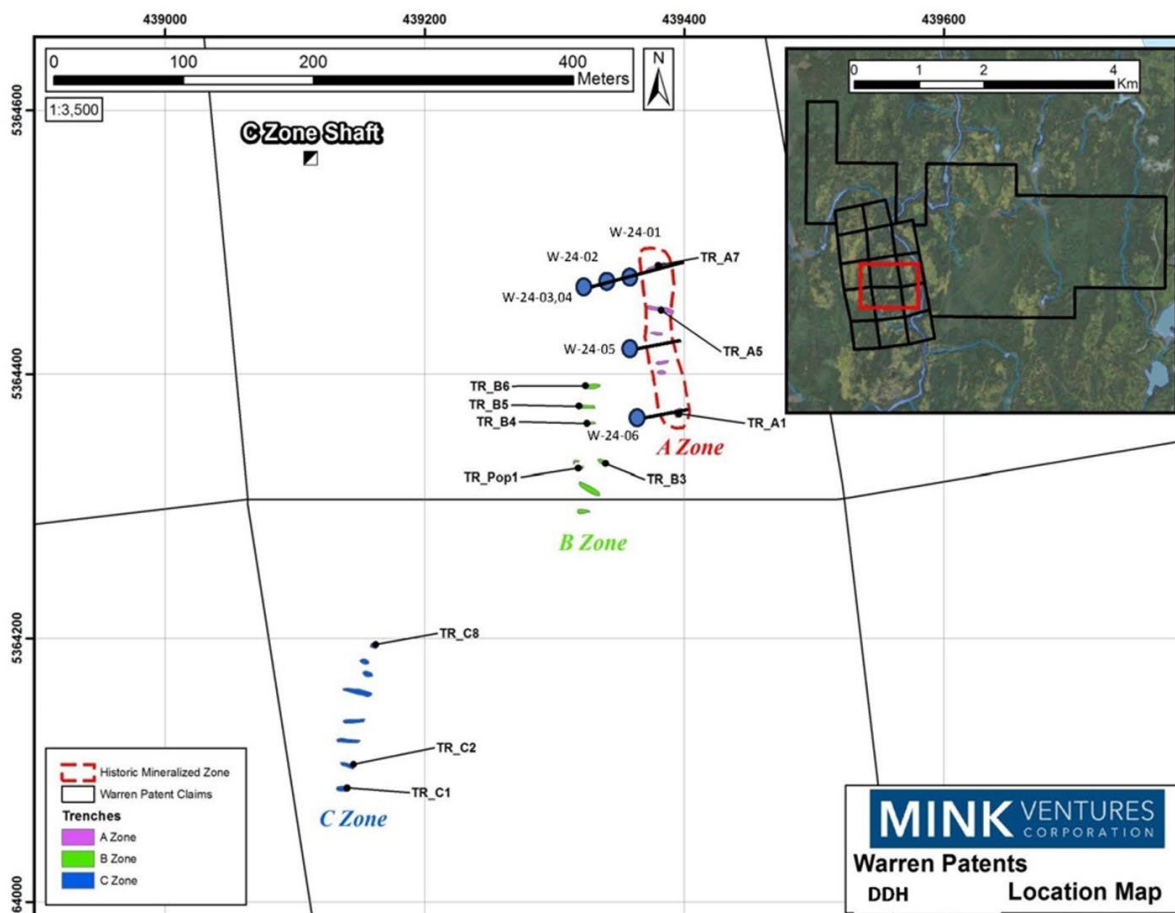


Figure 18. Drilling on Warren Patents, 2024 (Mink Ventures Corporation, news release, March 13, 2024).

Mink Ventures Corp. conducted summer prospecting and sampling of the Shaft, SW, D and North Zones to identify prospective targets for drilling. Thirty-eight samples were collected in total. Highlights from the summer sampling include the following (*from* Mink Ventures Corp., news release, September 4, 2024):

- North Zone samples collected from a historical blasted pit with massive sulphides ranging from 0.597 to 0.967% Ni, 0.0573 to 0.0738% Co and up to 0.515% Cu.
- Shaft Zone mineralization in the form of semi-massive and disseminated sulphides (pyrrhotite with minor chalcopyrite) returned Cu values ranging from 0.365 to 0.773%; Ni, from 0.341 to 0.461 and Co from 0.339 to 0.461%.
- SW Zone samples consisting of semi-massive and disseminated pyrrhotite and chalcopyrite in a gabbro intrusive returned Ni values between 0.354 to 0.401%. Cobalt values ranged from 0.0392 to 0.0475% and the best Cu value returned was 0.579%.
- D Zone surface exposures were re-examined due to the presence of sulphide mineralization in outcrop and historical channel samples that graded 0.5% Ni over 30 feet (9 m). Samples collected by Mink returned weakly anomalous nickel and copper.

Mink announced the commencement of a drilling program at the Shaft Zone in December, and received C\$168 615 in funding from the Ontario Junior Exploration Program to support the drilling program (Mink Ventures Corp, news release, December 16, 2024).

Rare Metal Exploration Projects

NEOTECH METALS CORP. / VR RESOURCES LTD. – HECLA-KILMER

Neotech Metals Corp.’s Hecla Kilmer property is located approximately 100 km north of Kapuskasing and is accessible via Highway ON-634 from Smooth Rock Falls (*see* Figure 4, no.29), between Kapuskasing and Cochrane.

VR Resources Ltd. sold its 100% interest in the Hecla-Kilmer REE (rare earth elements) property to NeoTech Metals Corp. for C\$1 000 000 cash consideration and 4 000 000 common shares of NeoTech, a total value of C\$3.6 million (VR Resources, news release, March 11, 2024). The completed transaction was announced on July 23 (VR Resources, news release, July 23, 2024). On September 26, NeoTech commenced metallurgical testing at Hecla-Kilmer to evaluate the project’s response to various flowsheets, assessing the feasibility of an expanded drilling campaign integrating apatite-hosted REE mineralization, niobium-related mineralization and overall phosphate recoveries (NeoTech Metals Corp., news release, September 26, 2024).

In November, NeoTech completed its 5000 m maiden drilling program at Hecla-Kilmer aiming to extend mineralization laterally from previous holes that intersected total rare earth oxides (TREO) from bedrock surface and further test the “South Rim” zone (NeoTech Metals Corp., news release, November 19, 2024). The drilling program was partially funded by a \$200 000 Ontario Junior Exploration Grant (NeoTech Metals Corp., news release, September 23, 2024). Assay results have not been released at the time of writing.

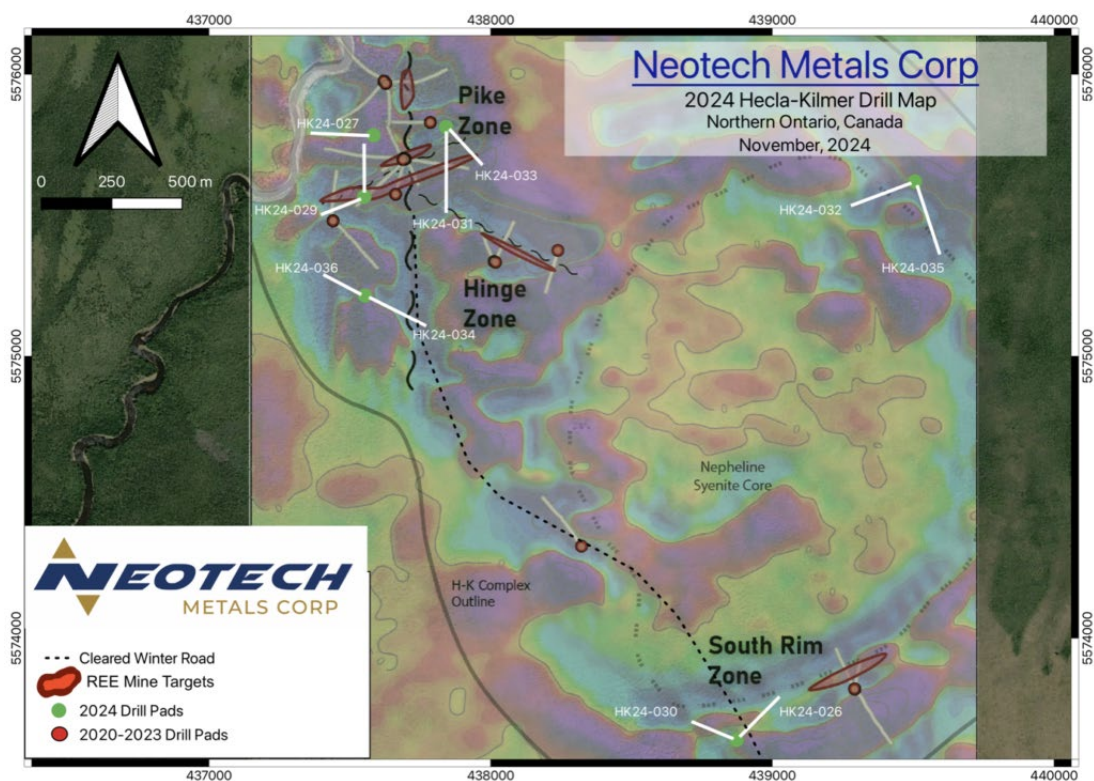


Figure 19. Detailed magnetics map of Hecla-Kilmer, overlain by 2024 drilling completed by VR Resources and further work completed by NeoTech Metals Corp. (NeoTech Metals Corp., news release, November 19, 2024). UTM co-ordinates in NAD83, Zone 17.

Gold Exploration Projects

PTX METALS INC.– HEENAN AND MALLARD GOLD PROPERTIES

The Heenan and Mallard properties, part of the South Timmins Mining Joint Venture with Fancamp Exploration, is located in Heenan, Benton and Mallard townships in the Timmins District (*see* Figure 4, no.24). The property, approximately 110 km southwest of Timmins, can be accessed via industrial roads off of Highway ON-144 (PTX Metals Inc., <https://ptxmetals.com/projects/heenan-mallard/>, website accessed January 30, 2025).

PTX Metals Inc. (formerly Platinex Inc.) reported results from Phase 1 exploration work on its South Timmins Joint Venture gold projects completed between 2023 and early 2024. At Mallard, stripping and channel sampling were conducted over 1022 m² in 2 areas. The main stripped area covered quartz–carbonate-altered mafic volcanics in contact with quartz-feldspar porphyry. Fifty-one samples were collected, with gold grades ranging from below detection limit to 0.98 g/t over 0.75 m to 1 m sample lengths (PTX Metals Inc., news release, August 7, 2024).

Results from the 2023 drilling program on the Heenan Property were released in February and were focused on following up on results obtained from past geochemical and prospecting programs. The three-hole program totalled 611 m, with highlights including the following (PTX Metals Inc., news release, February 21, 2024):

- HE23-02: 77.4 m at 0.40 g/t Au
- HE23-03: 27.15 m at 0.55 g/t Au

Gold mineralization identified as a result of drilling was primarily associated with quartz veining and pyrite mineralization within the Woman River Iron Formation (PTX Metals Inc., news release, February 21, 2024). Channel sampling at Heenan included follow up on 2023 drilling, which outlined a new discovery at the property and returned gold values between 0.51 to 5.77 g/t gold over 0.25 m sample lengths (PTX Metals Inc., news release, August 7, 2024).

DISTRICT STAFF AND ACTIVITIES

In 2024 the Timmins Resident Geologist Office was staffed by V. D'Angelo, P.Geo., Acting Regional Resident Geologist; M. Krukowski, P.Geo. (January to March), District Geologist; V. Gagnon-Coderre (June to December), District Geological Assistant; S. Hinz, P.Geo., Mineral Inventory Geoscientist; C. Daniels, P.Geo., Land Use Planning and Policy Coordinator; and P. Bousquet, P.Geo., Regional Land Use Geologist.

In 2024, the District and Acting Regional Resident Geologist of the Timmins Resident Geologist Program (RGP) completed over 340 client requests, primarily through electronic correspondence such as telephone, email and video conferencing. There were 55 in-person office visits completed through appointments at the Timmins office and 4 drill-core library visits to the onsite and offsite facilities. A summary of client requests is available below in Table 13.

Table 13. Timmins RGP office client requests, 2024.

Month	Client Requests Completed	In-person Office Visits	Drill Core Library Visits
Jan	35	8	0
Feb	32	4	0
Mar	49	6	0
Apr	50	4	0
May	17	2	0
Jun	43	4	2
Jul	18	3	0
Aug	40	15	0
Sep	18	5	0
Oct	23	4	2
Nov	16	0	0
Dec	3	0	0
Total	341	55	4

The Timmins RGP staff maintained its role in producing monthly reports on mining and exploration activities in the Timmins District. These updates can be found under the “Exploration Activity” layer in the Ontario Geological Survey’s GeologyOntario Spatial Search. Staff also continued to offer consultancy to other government entities, exploration companies and independent prospectors who were conducting geologic work in the District. Staff continued to offer rock identification services to the public, made available through direct in-person contact and through online platforms. Timmins staff conducted 4 presentations to the public, in an effort to spread geoscience knowledge and provide mining and exploration updates to the community (Table 14).

In collaboration with the Kirkland Lake RGP District staff, Timmins had the opportunity to participate in 4 sessions of Camp Chikepak, an Indigenous led summer camp for youth. The sessions provided an overview of minerals encountered in our everyday lives followed by a mineral identification session, where students were taught how to identify common rock forming minerals. Timmins staff also had the opportunity to attend the Taykwa Tagamou Nation career fair to discuss geology and career opportunities in geoscience to community members and other participants.

Table 14. Timmins RGP presentations in 2024.

Date	Topic	Venue	Presenter
March 7	History of Gold Mining in the Timmins Camp	Prospectors & Developers Association of Canada (PDAC)	M. Krukowski and B. Maity (District Geologist - Sault Ste. Marie)
May 23	Exploration and Mining Activity Update for the Timmins and Sault Ste. Marie Districts	Porcupine Prospectors and Developers Association (PPDA)	V. D’Angelo
October 2	Exploration and Mining Activity Update for the Timmins District	Northeastern Ontario Mines and Minerals Symposium	V. D’Angelo
November 27	Exploration and Mining Activity Update for the Timmins and Sault Ste. Marie District	OGS Virtual Showcase 2024	V. D’Angelo

The Timmins RGP office participated in 2 rounds of document scanning. During the first round, 23 banker boxes (193 folders) containing 722 donated files and historical assessment reports were shipped from Timmins and scanned by Orix early in January. The Timmins office shipped an additional 37 boxes with 496 folders for scanning in October.

Drill Core Storage Site

Timmins RGP staff continued to maintain the onsite and offsite drill-core facilities throughout 2024. The Remote Drill Core Storage Site underwent an extensive landscaping program; however, no core was removed or reboxed. The Remote Drill Core Storage Site and the Onsite Drill Core Storage Site in Timmins were utilized by clients 4 times in 2024.

PROPERTY EXAMINATIONS

Table 15 lists the property visits conducted by staff in 2024 in the Timmins District. Locations, keyed to the property numbers, are shown in Figure 20. These property visits were collaborative visits with other government staff, visits to ongoing mining operations within the district and visits requested by clients of the Timmins office for review and technical advice.

Table 15. Property visits conducted by the Timmins District Geologist and staff in 2024 (keyed to Figure 20).

Number	Property, Occurrence or Area	Client	Commodity	OMI Number	Township / Area
1	Sudbury Impact Geology*	OGS			
2	Bernard Bryan Property	Bernard Bryan	Au		Chester
3	Timmins West Mine	OGS	Au	MDI42A05NE00003	Bristol
4	Jefferson Showing	OGS	Cu, Pb, Zn	MDI41O16SW00022	Marion
5	Hearst Fertile Granites	OGS			Multiple
6	Dana Lake Mylonites	Bill McRae			Whitesides
7	Joseph Pustina Claims	Joseph Pustina	Au		Pharand
8	Kidd Operations	Glencore	Zn, Cu, Ag, Pb	MDI42A11NW00002	Kidd
9	Massey Project	Bob Bailey	Ni, Cu	MDI42A05NW00016	Massey

* Outside Timmins District. Abbreviation: OMI, Ontario Mineral Inventory.

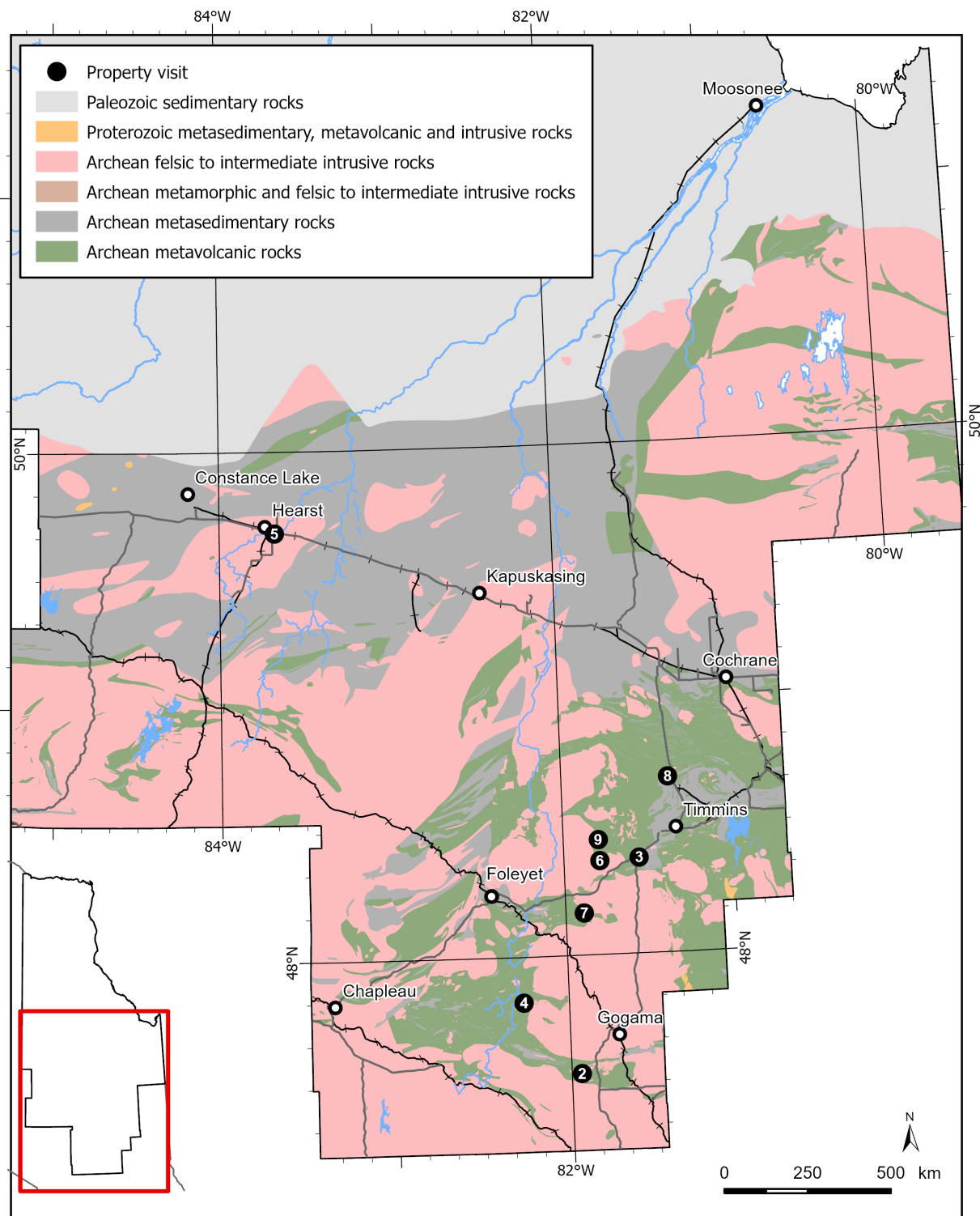


Figure 20. Property visits conducted by Timmins RGP staff in 2024. Numbers keyed to Table 15.

RECOMMENDATIONS FOR EXPLORATION

Biogeochemical Sampling in the Timmins and Sault Ste. Marie Resident Geologist Districts

Note: the following Recommendation for Exploration is *modified from* D'Angelo (2025).

INTRODUCTION

Bark sampling is an underappreciated addition to the mineral exploration tool kit which has seen little application in the Timmins and Sault Ste. Marie districts. While the technique is not new and studies on the applications of plant chemistry to mineral exploration were being used in the 1980s and 1990s (e.g., Dunn 1986; Dunn, Hall and Scagel 1993; Kovalevsky 1995), recent analytical advancements, particularly the use of inductively coupled plasma mass spectrometry (ICP–MS), has renewed the interest in biogeochemical sampling (Dunn 2007b). Bark sampling in early exploration is an effective method that can get around common challenges faced by explorationists and prospectors in northeastern Ontario. The terrain in the Timmins and Sault Ste. Marie areas can be challenging, with extensive areas covered by water bodies and Quaternary deposits that can limit the availability of outcrops for traditional “boots on the ground” geological mapping and direct bedrock observation. While there are a variety of biogeochemical survey methods being tested in exploration, this article specifically examines the application of black spruce (*Picea mariana*) bark sampling to identify areas that may be prospective for mineralization within the Timmins and Sault Ste. Marie districts.

The basic idea behind biogeochemical survey is that metals are absorbed from soil, groundwater and locally from bedrock where roots penetrate faults, joints and cleavages. The root system of a plant may penetrate through many cubic metres of the substrate, and therefore integrate the geochemical signature of a large volume of soil, groundwater and bedrock (Dunn 2007a). Because elements can migrate upward from considerable depth in solution, by diffusion, in electrochemical cells, and possibly by seismic pumping (i.e., release of metals due to earth tremors), depth of root penetration is not critical for a biogeochemical response (Dunn 2007a).

The primary commodities explored for in the Timmins and Sault Ste. Marie districts are gold and base metals, for which the use of spruce bark sampling has been demonstrated as an effective exploration tool. In addition, the Ontario Geological Survey is currently conducting a study to assess the effectiveness of black spruce bark sampling for lithium exploration in the Kenora District (Amyotte et al. 2022; Amyotte 2023).

RECOMMENDATIONS

Black spruce trees are particularly suitable for this type of sampling due to their ability to uptake and store a wide array of elements in their bark (Dunn 2007a). They are adaptable to various moisture levels, tolerate partial shade, and can grow in a variety of soil types (Ministry of Natural Resources 2014). The Timmins and Sault Ste. Marie districts, with its abundant black spruce population (Ministry of Natural Resources 2023) and challenging terrain (marshlands and overburden), is an ideal location to use this method. Black spruce trees are effective at storing precious metals, base metals, and potentially lithium in their bark, making them valuable indicators for the types of mineral deposits found in the region (Dunn 1986, 2007a; Amyotte et al. 2022; Amyotte 2023).

Identifying black spruce trees is straightforward, as they are characterized by their egg-shaped dark brown cones, their height of 20 to 30 m, trunk diameter of 23 to 26 cm, short dark bluish-green needles, and thin scaly grey-brown bark (Ministry of Natural Resources 2014; Figure 21). For consistent and reliable results and to rule out any anomalies derived from sampling error, it is recommended that samples be collected from trees of similar height and width, and at consistent heights from the ground (Dunn 2007a).

An example of a successful sampling campaign was done by Probe Gold Inc. (*formerly* Probe Metals Inc.) on their Detour Quebec property (La Peltrie property) overlying the Abitibi greenstone belt. The sampling consisted of 1010 spruce bark samples with a spacing of 400 m covering approximately 292 km² (see Figure 22) which cover local areas of known mineralization. The known areas of mineralization were used as baseline to identify pathfinders and mineral signatures on the regional to local scale. The company was successful in identifying several new targets on the property (Beh and LaFontaine 2021), which led, in part, to a discovery of a copper-gold-silver-molybdenum mineralized system (Probe Gold, news release, December 6, 2022, <https://probegold.com/news/probe-metals-and-midland-discover-a-large-copper-gold-silver-molybdenum-system-on-la-peltrie-option-property-detour-project/> [accessed December 13, 2024]).

CONCLUSIONS

Black spruce bark sampling is a relatively new but promising technique in the field of mineral exploration. Bark sampling allows for the collection of samples in areas with significant marshland and overburden, thanks to the resilience and widespread occurrence of black spruce. Sampling can be completed year-round, regardless of weather conditions, allowing for a compressed exploration timeline where samples can be collected in the winter and follow-up studies tested the following summer. Additionally, the collection process is both cost-effective, quick and straightforward, making it an attractive option for early exploration surveys. As with any new exploration technique, it is recommended to conduct baseline surveys in areas of known mineralization as proof of concept and ensure careful data collection prior to any interpretation to achieve accurate and meaningful results.

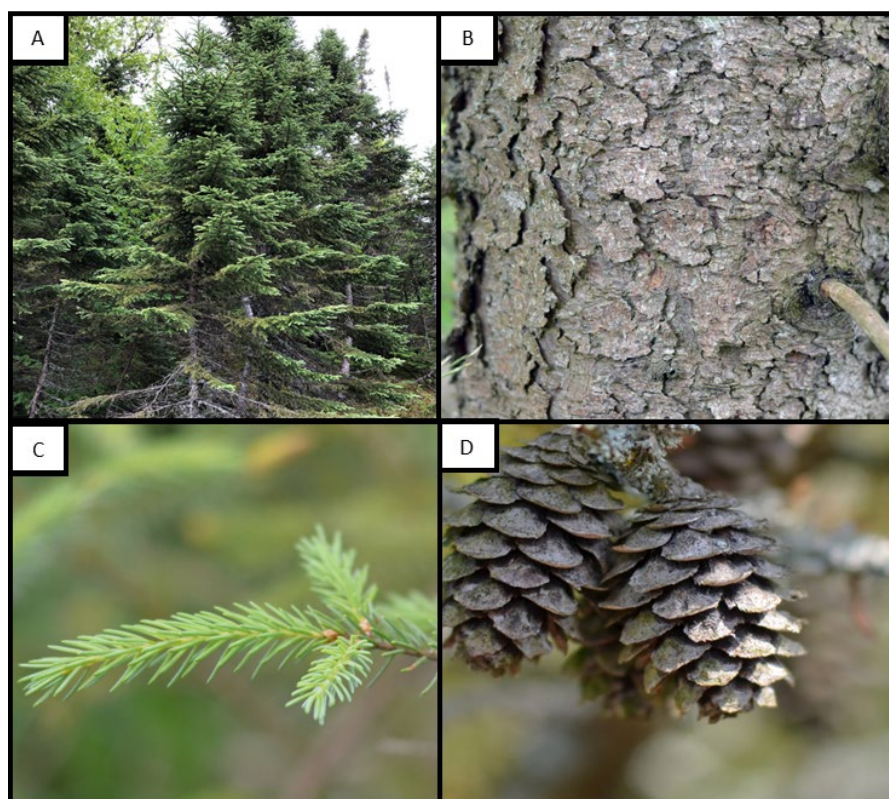


Figure 21. Key features for the identification of black spruce trees, a common species of evergreen in Ontario. **A)** Black spruce trees are generally 20 to 30 m in height. **B)** The bark of a black spruce is thin, paper like and very easy to remove, **C)** short bluish-green needles and **D)** cones are brown and egg shaped when compared to other species of evergreens in Ontario (*from* Ministry of Natural Resources 2014).

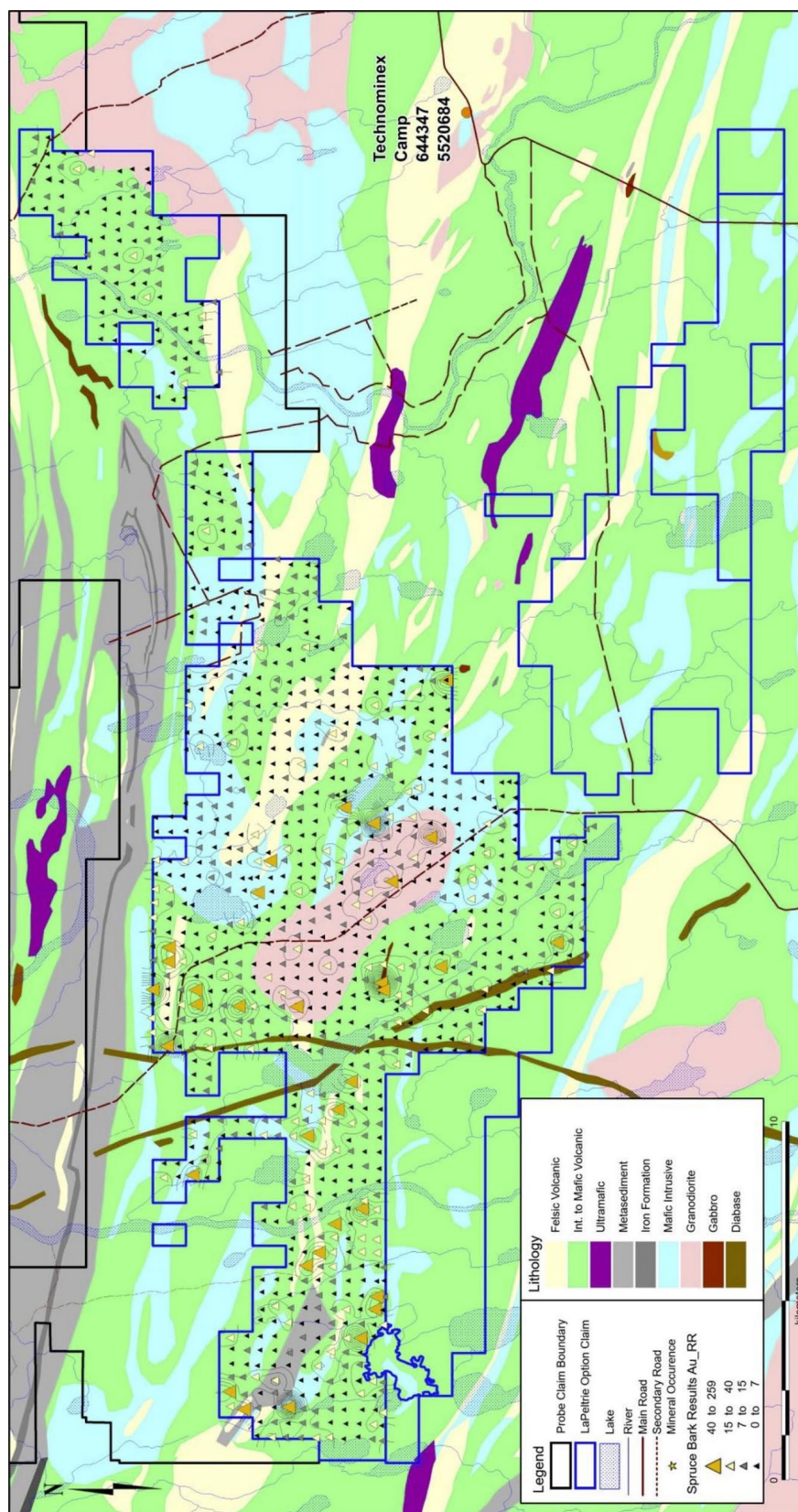


Figure 22. Results of a broad orientation survey by Probe Gold Inc. (formerly Probe Metals Inc.) on the La Peltrie property, Quebec. The gold concentrations in black spruce bark shows correlation with historical mineral occurrences on the property (from Beh and LaFontaine 2021).

OGS ACTIVITIES AND RESEARCH BY OTHERS

There were 49 publications received by the Timmins District Geologist office in 2024 (Table 16). Of these, 5 were written reports, 36 were maps (from one geophysics survey) and 8 were presentations. Timmins staff directly contributed to 3 of these publications.

Table 16. Publications received by the Timmins District Geologist office in 2024.

Title	Author	Type and Year of Publication
Report of Activities 2023, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	V. D'Angelo, M. Krukowski, B.K. Maity, P. Bousquet, C.M. Daniels, S.L.K. Hinz, G. Meyer, N. Sabiri, J. Swiercz and C.J. Adrianwalla	Ontario Geological Survey, Open File Report 6410, 2024
Recommendations for Exploration 2023 – 2024	Resident Geologist Program, Ontario Geological Survey	Ontario Geological Survey, Resident Geologist Program, Recommendations for Exploration (2024)
Summary of Field Work and Other Activities, 2024	Ontario Geological Survey	Ontario Geological Survey, Open File Report 6413, 2024
Ontario Groundwater Geoscience 2024 Open House	A.K. Burt, L.M. Colgrove, K.J.J. Kalmo, D. Ford, S. Holysh, H.A.J. Russel	Ontario Geological Survey, Open File Report 6406, 2024
Specific articles/reports of interest:		
Ambient Groundwater Geochemical and Isotopic Data for Northeastern Ontario, 2016–2018	K.M. Dell, S.M. Hamilton	Miscellaneous Release—Data 401 (2024)
OGS Showcase	Ontario Geological Survey	Ontario Geological Virtual Showcase 2024, November 26–28, 2024
Ontario Airborne Geophysical Surveys, Magnetic Gradiometer Data, Grid and Profile Data (ASCII and Geosoft® Formats) and Vector Data, Winisk River Area	Ontario Geological Survey	Geophysical Data Set 1069 (2024)
Airborne Magnetic Gradiometer Survey, Colour-filled Contours of the Residual Magnetic Field, Winisk River Area	Ontario Geological Survey	80 000 Series Map 82542, 82543, 82544, 82545, 82546, 82547, 82548, 82549, 82550, 82551, 82552, 82553, 82554, 82555, 82556, 82557, 82558, 82559, 82560, 82561, 82562, 82563, 82564, 82565, 82566, 82567, 82568, 82569, 82570, 82571, 82572, 82583, 82574, 82575, 82576, 82577, 82578, 82579
Specific presentations of interest:		
Exploration, Mining and Resident Geologist Program Activity Update for the Timmins and Sault Ste. Marie Districts	V. D'Angelo	Presentation SHOWCASE-24-202 (2024)
An Update to the Southern Swayze Area Bedrock Mapping Project (Western Abitibi Greenstone Belt)	T. Gemmell	Presentation SHOWCASE-24-203 (2024)
Preliminary Structural Mapping of Deformation Zones in the Northeastern Michipicoten Greenstone Belt	L. Vice	Presentation SHOWCASE-24-204 (2024)
Exploration, Mining and Resident Geologist Program Activity Update for the Kirkland Lake and Sudbury Districts	J. Suma-Momoh	Presentation SHOWCASE-24-205 (2024)
Precambrian Geology and Mineral Potential of Totten Township, Sudbury District	N. Carter	Presentation SHOWCASE-24-206 (2024)
An Update on Critical Minerals in Gold Deposits and New Compilation Mapping in Timmins and Kirkland Lake	E. Hastie	Presentation SHOWCASE-24-207 (2024)
Reconnaissance Mapping in Van Hise, Haultain and Nicol Townships, Abitibi Greenstone Belt, Northeastern Ontario: An Update	J. Walker	Presentation SHOWCASE-24-208 (2024)
Drumlins, DeGeers, Deltas and Dunes: landforms and the Regional Deglaciation of the Lake Nipissing Basin, Northeastern Ontario	A. Marich	Presentation SHOWCASE-24-209 (2024)

MINERAL DEPOSITS NOT BEING MINED

As of 2024, there are 57 mineral deposits in the Timmins District that are not being mined (Table 17). The most common commodity is gold (Au); however, the Timmins Districts has base metal, rare earth element (REE), graphite and other industrial minerals deposits that are not actively being mined.

Table 17. Mineral deposits not being mined in the Timmins District in 2024.

Abbreviations					
AF	Assessment Files	MDC	Mineral Deposit Circular [No.15–]		
AR	Annual Report		[formerly Mineral Resources Circular, No.1–14]		
CAMH	<i>Canadian and American Mines Handbook</i>	MDIR	Mineral Deposit Inventory record		
	[since 2004–2005]	MLS	Mining Lands, Sudbury		
CMH	<i>Canadian Mines Handbook</i>	MR	Mining Recorder		
	[up to and including 2003–2004]	NM	<i>The Northern Miner</i>		
GR	Geological Report	OFR	Open File Report		
MD&A	Management Discussion and Analysis	PC	Personal Communication		

Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Albany graphite deposit, Pitopiko River area MDI00000001484	graphite	Total Indicated Resource: 25.1 Mt at 3.89% Cg; Total Inferred Resource: 20.1 Mt at 2.2% Cg	Zentek	NI 43-101 Rpt. 9/07/2015	Diamond drilling in 2019
Augdome property Tisdale Tp. MDI42A06NE00086	Au	Historical resource: 140 000 tons at 0.15 oz/t Au	McLaren Resources Inc.	CMH 1986–87 p.50 McLaren Resources Inc. January 4, 2018	Last active 1987 Diamond drilling, 2017
Block A property west of Sunday Lake MDI32L04SW00012	Au	Measured and Indicated Resource estimate: 180.9 Mt grading 0.89 g/t Au (5 111 000 oz Au); Inferred Resource estimate: 20.8 Mt at 0.42 g/t Au (146 000 oz Au)	Agnico Eagle	NI 43-101 Rpt. 26/07/2021	Active
Paymaster Project, advanced exploration project (past producer) Whitney Tp. MDI42A11SE00021	Au	Indicated Resources (2013): 5 135 000 tons average 0.047 oz/t gold for 242 000 oz gold. Inferred Resource (2013): 1 781 000 t, averaging 0.065 oz/t gold for 115 000 oz/t	Newmont	Tahoe Resources Inc. 14/01/2014	Diamond drilling 2009–2014; Technical Report filed; Past producer 1915–1965.
Buffalo Ankerite property (past producer) Deloro Tp. MDI42A06NW00011 MDI42A06NW00015	Au, Ag	Indicated Resource (open pit and underground): 3.82 Mt at 2.37 g/t Au (292 800 oz) underground; 3.27 Mt at 4.76 g/t Au; Inferred Resource (open pit): 2.74 Mt at 2.31 g/t (203 400 oz); Inferred Resource (underground): 2.81 Mt at 4.05 g/t Au for 367 100 oz Au	McEwen Mining Inc.	NI 43-101 Rpt. 05/06/2014	Past producer 1939–1953. Diamond drilling 2007–2014
Carshaw property Shaw Tp. MDI42A06NE00016	Au	145 250 t at 5.17 g/t Au (Proven and Probable)	Carshaw Gold Mines Inc.	CMH 2001, p.234	Inactive

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Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Clay–Howells Fe-REE Project Clay and Howells Tp. MDI42G16SE00006	Fe, REE	Inferred Resource: 8 477 000 t at 0.73% total rare earth oxides, 0.13% Nb ₂ O ₅ , 44.17% Fe ₂ O ₃	Canada Rare Earth Corporation	NI 43-101 Rpt. 26/09/2011	Purchase and corresponding sale of 16 500 t of rare earth concentrate over a 3-year period
Clavos gold mine (past producer) Stock and German Tps. MDI42A10SW00046	Au	Indicated Resource: 1 258 400 tonnes at 4.81 g/t (194 600 oz) Inferred Resource: 796 000 tonnes at 4.7 g/t (120 000 oz)	Grace Gold	NI 43-101 Rpt 12/04/2013	
Davidson Tisdale Tisdale Tp. MDI42A11SE00011	Au	Open pit resources Measured: 452 000 t at 2.44 g/t Au (35 500 oz); Indicated open pit: 0.12 Mt at 2.43 g/t Au (9300 oz) Underground resources Indicated: 3 356 000 t at 4.91 g/t Au (4400 oz) Underground resources Inferred: 0.05 Mt at 4.0 g/t Au (6600 oz) Open pit Indicated 0.12 Mt averaging 2.43 g/t Au for 9300 oz Underground Indicated Resources: 30 Kt; averaging 4.91 g/t Au for 9300 oz Underground Inferred Resource: 50 Kt averaging 4.2 g/t Au for 6600 oz	McEwen Mining Inc.	NI 43-101 Rpt. 01/06/2014	Diamond drilling 2010–2014
De Santis Mine Ogden Tp. MDI42A06NW00025	Au	Albitite Zone: 72 212 tons at 0.229 oz/t Au (Probable; non-NI 43-101 compliant); Hydrothermal Zone: 334 308 tons at 0.19 oz/t Au (estimated non-NI 43-101 compliant)	Transition Metals	Lateegra Gold Corp. press release 08/02/2010	Diamond drilling 2012–2013 (DD-18-6686 m)
Deloro nickel-cobalt deposit Deloro Tp. MDI42A06NW00190	Ni, Co	Indicated Resource: 81.3 Mt at 0.25% Ni (201.8 kt Ni) Inferred Resource: 357.5 Mt at 0.25% Ni (885.4 kt Ni)		Canada Nickel Company NI 43-101 Rpt. 17/07/2024	Active
Detour Lake West Gold Project west of Sunday Lake area MDI32L04SW00016	Au	Measured Resource: 0.3 Mt at 0.89 g/t Au (7 000 oz) Indicated Resource: 22 700 000 t at 0.88 g/t Au (644 000 oz)	Agnico Eagle	Kirkland Lake Gold NI 43-101 Rpt. 31/12/2020	Inactive
Dundonald South deposit Dundonald Tp. MDI42A10NW00039	Ni	Inferred Resource: 116 000 t at 3.16% Ni (3658 t Ni)	Class1Nickel	NI 43-101 Rpt. 30/01/2009	Diamond drilling 2021

Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Ravena (past producer) Penhorwood Tp. MDI42B01SE00004	Ba	Historical resource: 100 000 t at 95% barite	Extender Minerals of Canada Ltd.	AF	Inactive
Fuller Project Tisdale Tp. MDI42A06NW00030	Au	Total Indicated (open pit): 6 239 000 t at 0.056 oz/t Au (351 000 oz); Total Inferred (open pit): 3 911 000 t at 0.063 oz/t Au (247 000 oz); Underground Indicated Resource: 0.33 Mt at 5.77 g/t Au (61 000 oz Au); Inferred: 0.82 Mt at 4.97 g/t Au (135 000 oz)	McEwen Mining Inc.	NI 43-101 Rpt. 05/06/2014	Diamond drilling Tisdale and Deloro Tps. 2011– 2014; Jan. 2014 – filed technical report; June 2011–2014: diamond drilling. Dec 31, 2014 – McEwen Mining Inc. May 2006, technical report. 2011– 2014 drilling, filed technical report Open pit Indicated: Resource of 5.33 Mt averaging 1.68 g/t Au for 290 000 oz; Underground Indicated: 0.33 Mt, average 5.76 g/t Au for 61 000 oz gold. Open pit Inferred Resource: 2.7 Mt averaging 1.3 g/t Au for 112 000 oz gold
144 Gap deposit Thorneloe Tp. MDI42A05NE00121 MDI42A05SE00065	Au	Indicated Resource: 1 734 000 t at 5.41 g/t Au (301 700 oz) Inferred Resource: 1 914 000 t at 5.19 g/t Au (1 027 800 oz)	Pan American Silver	CMH 2014–2015 p.407	Infill drilling 2021
Goose Lake Iron prospect Shaw Tp. MDI42A06NE00038	Fe	100 000 000 t at 68.8% Fe (historical resource)	Timnor Iron Ore	AF	Diamond drilling 2013
Hart prospect Eldorado Tp. MDI42A06SE00065	Ni, Cu	Total Indicated Resource: 1 546 000 t at 1.40% Ni, 0.10% Cu (47 779 000 lb Ni); Total Inferred Resource: 322 000 t at 1.26% Ni, 0.08% Cu (899 000 lb Ni)	2812794 Ontario Inc.	CMH 2016–2017 p.358	Diamond drilling 2012
James Bay Niobium Project (Argor Carbonatite) west of Marberg Creek area MDI42I15SE00004	Nb ₂ O ₅	Total Indicated Resource: 29 700 000 t at 0.53 Nb ₂ O ₅ (305 000 000 lb Nb ₂ O ₅) Total Inferred Resource: 33 800 000 t at 0.52 Nb ₂ O ₅ (285 000 000 lb Nb ₂ O ₅)	Niobay Metals Inc.	NI 43-101 Rpt. 24/08/2021	Active - Advanced exploration project
Part of Côté Gold Project Jerome gold mine (past producer) Osway Tp. MDI41O09SE00005	Au	Inferred Resource: 18 737 000 t at 1.71 g/t Au (1 030 489 oz)	IAMGOLD Corporation	Augen Gold Corp. NI 43-101 Rpt. 18/07/2011	Diamond drilling 2010

TIMMINS DISTRICT—2024

Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Kabinakagami Lake occurrence Lizar Tp. MDI42C16NW00004	Fe	10 100 000 t at 66.5% Fe	Bear Creek Gold Ltd.	MDC 11	Alienated Land
Alexo–Dundonald property	Ni, Cu, Co	Alexo–Dundonald Indicated Resources (open pit and underground): 1 250 000 t averaging 0.99% Ni, 0.03% Cu, 0.02% Co for 27.35 million lb Ni, 1 million lb Cu and 0.66 million lb Co Alexo–Dundonald Inferred Resource: 2 010 000 t averaging 1.01% Ni, 0.03% Cu, 0.02% Co for 44.51 million lb Ni, 1.29 million lb Cu and 0.89 million lb Co	Class 1 Nickel	NI 43-101 Rpt. 01/12/2020	Past producer. Re-logging of old core since 2019
Kenilworth (Naybob) Mine Ogden Tp. MDI42A06NW00022	Au	North Zone unclassified: 138 900 tons in 13 areas, grades up to 0.25 oz/t Au; South Zone unclassified: 600 000 tons at 0.23 oz/t Au	Newmont and Metals Creek Resources Corp. JV	AF	Diamond drilling in 2022
Kenty Mine Swayze Tp. MDI41O15SE00029	Au	Historical resource: #9 vein has possible resource of 43 300 t at 4.7 g/t Au	Joshua Gold Resources Inc.	AF	Inactive
Kidd #3 Zone Chester Tp. MDI41P12SW00122	Au	Historical resource: 408 000 t at 9.9 g/t Au	IAMGOLD Corporation	OGS OFR 5912	Inactive
Kipling Kaolin Kipling Tp. MDI42J01NE00005	kaolin, silica sand, ball clay	Historical resource: 30 000 000 t	Great Lake Kaolin Inc	OGS OFR 5918	Inactive
Langmuir deposit Langmuir Tp. MDI42A06SE00099	Ni, Cu, PGE	Indicated Resource (W4 deposit, open pit and underground): 677 000 lb averaging at 1.00% Ni, 0.06% Cu, for 14 813 000 lb Ni and 989 000 lb Cu Inferred Resource: 3 360 000 lb Ni and 210 000 lb Cu	EV Nickel	NI 43-101 Rpt. 30/04/2021	Past producer
Langmuir #2 North deposit Langmuir Tp. MDI42A06SE00006	Ni, Cu	Indicated Resource: 8 324 000 t at 0.40% Ni, Inferred Resource: 1 017 000 t at 1.38% Ni	EV Nickel	NI 43-101 Rpt. 30/04/2021	Past producer
Loveland Nickel property Formerly known as: Loveland property Loveland Tp. MDI42A12NE00028	Cu, Ni, PGE	Cominco Zone: 130 000 tons at 0.68% Ni, 0.73% Cu (historical resource) Hollinger Zone: 422 000 tons at 0.71% Ni, 0.42% Cu (historical resource)	Moneta Porcupine Mines Inc.	Amador Gold Corp. website 19/01/2011	Diamond drilling 2017

Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Project 81 Formerly known as: Lucas Gold Project Lucas Tp. MDI42A14SE00005	Au	136 077 t at 3.4 g/t Au (drill indicated)	Noble Mineral Exploration Inc.	AF	Down hole geophysics in 2020
Martison Lake deposit South of Ridge Lake MDI42J06SW00004	phosphate, REE	Indicated Resources (Anomaly A): 53 800 000 t at 22.99% P ₂ O ₅ , 0.49% Nb ₂ O ₅ Inferred Resource: 128 300 000 t at 17.9% P ₂ O ₅ , 0.42% Nb ₂ O ₅ Indicated Resources (Anomaly A lateritic material): 6 200 000 t at 7.97% P ₂ O ₅ , 1.13% Nb ₂ O ₅ Inferred Resource: 5 300 000 t at 6.40% P ₂ O ₅ , 0.69% Nb ₂ O ₅	Fox River Resources Corporation	NI 43-101 Rpt. 06/06/2022	Active
Multi Minerals Zones 3 and 4 McNaught Tp. MDI41O14SE00024	phosphate, niobium	Historical resource: 37 000 000 t at 0.17% Nb ₂ O ₅ and 21.3% apatite	6378366 Canada Inc., 6070205 Canada Inc.	OGS Study 32	Sampling 2010
Multi Minerals Zone 6 McNaught Tp. MDI41O14SE00011	iron, phosphate, niobium	Historical resource: 4 557 000 t at 69.9% magnetite, 21.88% apatite, 0.12% Nb	6378366 Canada Inc., 6070205 Canada Inc.	OGS Study 32	Sampling 2010
Nemegosenda property Chewett Tp. MDI42B03SE00005	Nb ₂ O ₅	Inferred Resource: 11 000 000 tons at 0.46% Nb ₂ O ₅ (non-NI 43-101 compliant)	Sarissa Resources Inc. (Nio-Star Corp.)	Sarissa Resources Inc. NI 43-101 Rpt. 21/07/2009	Diamond drilling 2017
Nighthawk Lake property Cody Tp. MDI42A10SW00059	Au	Historical resource: 91 729 t at 6.06 g/t Au	Moneta Porcupine Mines Inc.	OGS OFR 6006	Diamond drilling 2017
North Rundle property Newton Tp. MDI41O16NW00002	Au	Historical Estimated Resource: 16 830 t at 7.1 g/t Au	First Mining Finance Corp.	NI 43-101 Rpt. 01/02/2011	Inactive
Onakawana Lignite Dyer Tp. MDI42I11SW00002	lignite	21 Mt at 5246 BTU	Onakawana Development Ltd.	OGS OFR 5111	Inactive
Owl Creek (East) Hoyle Tp. MDI42A11SE00006	Au	Historical assay resource: 3 019 685 t at 7.17 g/t Au	Newmont	OGS OFR 5985	Diamond drilling 2016
Owl Creek (West) Hoyle Tp. MDI42A11SE00006	Au	Inferred Resource: 327 230 t at 7.14 g/t Au	Newmont	OGS OFR 5985	Diamond drilling 2016
Paymaster Project Tisdale Tp. MDI42A06NW00002	Au	Total Indicated Resource (open pit) 5 135 000 tons at 0.047 oz/t Au (242 000 oz) Total Inferred Resource: 1 781 000 tons averaging at 0.065 oz/t Au for 115 000 oz Au	McEwen Mining Inc. 61% and Goldcorp Canada Inc. 39%	NI 43-101 Rpt. 05/06/2014	Diamond drilling 2009–2014

TIMMINS DISTRICT—2024

Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
West Cache Gold Project Formerly known as: Porcupine West property Bristol and Ogden Tps. MDI42A06NW00200	Au	Total Indicated Resource: 13 398 000 t at 1.52g/t Au (657 000 oz) Total Inferred Resource: 11 670 000 t at 1.71 g/t Au (640 000 oz)	Galleon Gold	NI 43-101 Rpt. 09/03/2021	Diamond drilling 2022
Radio Hill iron property Penhorwood Tp. MDI42B01NE00026	Fe	Historical Resource: 296 000 t raw magnetite at 25.58% Fe	Canada Nickel Company	NI 43-101 Rpt. 30/04/2010	Diamond drilling and metallurgical testing 2012
Redstone Mine Eldorado Tp. MDI42A06SE00080	Ni	Inferred Resource: 737 000 t at 1.57% Ni (25 519 000 lb Ni)	Northern Sun Mining Corp	MD&A 31/12/2012	Property under care and maintenance
Rundle Mine Newton Tp. MDI41O16SW00003	Au	Measured and Indicated: 349 000 t at 7.88 g/t Au Inferred Resource: 267 000 t at 6.68 g/t Au	First Mining Finance Corp.	NI 43-101 Rpt. 01/02/2011	Inactive
Sangold Gold Project Keith Tp. MDI42B01NE00012	Au	126 515 t at 12.78 g/t Au; 1 616 770 g (51 986 oz) Au	Gail Resources Inc.	CMH 2001	Diamond drilling 2005
Shunsby property Cunningham Tp. MDI41O10NE00056	Cu, Pb, Zn	Total mineral inventory 4 000 000 tons at 0.59% Cu and 2.56% Zn	BWR Exploration Inc.	AF	Diamond drilling 2014
Sothman nickel property Sothman Tp. MDI41P14SE00005	Ni	317 515 t at 0.89% Ni (0.5% cut-off)	Canada Nickel Company		Active
Sugar Zone Hambleton Tp MDI42C14SE00005	Au	Mineral Reserve (Proved + Probable): 2874 Mt at 5.5 g/t Au (506 koz Au) Mineral Resource (Measured + Indicated): 4.83 Mt at 8.2 g/t (1278 koz Au)	Vault Minerals	Vault Minerals Mineral Resources and Ore Reserves Statement June 30 2024	Infill Drilling 2024
Texmont deposit Bartlett Tp. MDI42A03NE00002	Ni	Historical Measured and Indicated: 2 893 000 tons at 0.92% Ni at 0.70% Ni cut off (26 757 contained tons)	Canada Nickel Company	Fletcher Nickel Inc. prospectus 14/05/2007	Diamond drilling 2009
TTM-Timmins talc- magnesite deposit Adams and Deloro Tps. MDI42A06SW00024	magnesite, talc	A Zone Core, Indicated Resource: 12 728 000 t at 52.1% magnesite, 35.4% talc; Inferred Resource: 18 778 000 t at 53.1% magnesite, 31.7% talc; A Zone Fringe, Indicated Resource: 5 003 000 t at 34.2% magnesite, 33.4% talc	Globex Mining Enterprises Inc.	NI 43-101 Rpt. 16/04/2012	Infill and geotechnical drilling (DD-46-7000 m) 2013
Thunderwood JV Hoyle Tp. MDI42A11SE00113	Au	327 230 t at 7.14 g/t Au (assay)	Newmont	OGS OFR 5985	

Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Timmins North Tully Tp. MDI42A11NE00034	Au	Indicated Resource to 350 m: 362 090 t at 8.0 g/t Au (93 140 oz) Total Inferred Resource: 592 070 t at 7.3 g/t Au (139 880 oz)	SGX Resources Inc.	NI 43-101 Rpt. 19/10/2010	Diamond drilling 2013
Upper Whitney deposit Whitney and Price Tp. MDI42A11SE00019	Au	Total Measured and Indicated Resource: 3 219 000 t at 6.85 g/t Au (708 600 oz); Inferred Resource: 995 000 t at 5.34 g/t Au (170 700 oz)	Pan American Silver and Newmont	Temex Resources Corp. NI 43-101 Rpt. 14/01/2014	Diamond drilling DD-13-1600 m, 2016. Hosts former producing mines Hallnor, Broulan Reef, Bonwhit and Hugh Pam. Produced a total of 2.4 million oz gold
Bell Creek Complex (Vogel- Schumacher property) Hoyle Tp. MDI42A11SE00124	Au	Indicated Resource: 2 219 000 t at 1.75 g/t Au (125 000 contained oz) Inferred Resource: 1 459 000 t at 3.6 g/t Au (168 800 oz)	Pan American Silver	NI 43-101 Rpt. 14/06/2011	Diamond drilling 2010; 2015 – 39 700 oz; 2014 – 43 400 oz
Warren Township anorthosite Warren Tp. MDI42B02NW00001	anorthosite	858 504 t at 30.92% Al (drill indicated)	Enviromine	AF	Permitted 2012
Watershed gold property Chester Tp. MDI000000001866	Au	Measured and Indicated Resources: 365 500 000 t at 0.87 g/t Au Inferred Resource: 189 600 000 t at 0.63 g/t Au	IMAGOLD	NI 43-101 Rpt. 26/11/2021	Active
Whitney talc-magnesite deposit Whitney Tp. MDI000000000349 MDI42A06NE00020	magnesite, talc	Measured and Indicated Resource: 54 076 357 t Inferred Resource: 43 000 000 t, grades from 43.5 to 51% talc; 25 to 38% magnesium minerals	General Magnesium Corp.	OGS Study 28	Surface mining test 2015

Note: This table contains tonnage and grade estimates referred to as reserves (indicated, possible, probable), which were determined at various times by methods largely unreported. Except where noted, none of these estimates are known to conform to the standards required for National Instrument 43-101 and should be considered inferred mineral resources not reserves.

Unit abbreviations used: DD-18-6686 m = 18 drill holes totalling 6686 m; lbs = pounds; Mt = million tonnes; opt = ounces per ton; oz = ounce(s); t = tonnes.

REGIONAL LAND USE GEOLOGIST ACTIVITIES—NORTHEAST REGION

Land Use Planning Activities

The northeast Regional Land Use Geologist (RLUG), based in Timmins, co-ordinates input into land-use planning activities in the Sault Ste. Marie, Timmins and Kirkland Lake Resident Geologist districts and the part of the Sudbury District that is north of the French River. In 2024, the northeast Regional Land Use Geologist position was staffed from January through December by Pierre Bousquet, *P.Geo.* The Land Use Planning and Policy Co-ordinator is the province-wide lead of the land use geology program. That position was held in 2024 by Catherine Daniels, *P.Geo.*, from January until October 27, and Peter LeBaron, *P.Eng.*, from October 28 until the end of year.

The boundaries of the Regional Land Use Geologists' regions are indicated on Figure 23.



Figure 23. Extent of the Regional Land Use Geologists' ("RLUG") areas of responsibility (red lines indicate the regional boundaries; grey lines indicate the municipal boundaries).

The objective of the position is to ensure that geoscience information is considered in policy and land-use planning decisions. The geoscience information relates to

- mineral-related values and economic opportunities
- natural geological and mining-related hazards
- renewable and non-renewable energy sources
- groundwater resources

Program activities that support this objective include helping develop, deliver and administer provincial policies, practices and procedures; and providing advice and guidance to municipalities, agencies and others involved in or affected by land-use planning regarding geoscience-related matters.

In 2024, the Regional Land Use Geologist dealt with a variety of land-use planning issues throughout the northeast region. The following sections summarize the work that was done.

CROWN LANDS

The Ministry of Mines (MINES) is responsible for all geoscience mapping within the province and administers mineral exploration and development under the *Mining Act*. The Ministry of Natural Resources (MNR) is responsible for mineral aggregate extraction under the *Aggregate Resources Act*, in addition to being responsible for mapping and regulating many other natural resource features and activities.

The Ministry of Mines, through the Regional Land Use Geologist, engages with the other Ministries when Crown land-use planning activities have the potential to impact provincial mineral interests, or to expose those using Crown lands to natural geological or mining-related hazards. These activities relate to forest management planning; energy and other major infrastructure projects; Far North land-use planning; proposals to modify existing parks or create new ones; and various other initiatives related to Crown land use.

Forest Management Planning

The forest management planning process involves consideration of a wide range of values, including mineral values, in the context of forestry activities, and the relevance of legislation other than the *Crown Forest Sustainability Act*, such as the *Mining Act*.

In 2024, 1 minor amendment concerning Sudbury Forest 2020–2030 Management Plan was reviewed.

Approved Forest Management Plans, with detailed information about annual operations, including plans for creating new access routes or decommissioning existing routes, and maps showing forest access roads are posted on the MNR Natural Resources Information Portal (<https://nrip.mnr.gov.on.ca/s/fmp-online>).

Far North Land Use Planning

The Far North Land Use Planning Initiative is about working with First Nations to identify where development may occur and where land will be designated for protection in the Far North of Ontario. The Far North encompasses 42% of Ontario's land mass in an area generally north of the areas where forest management planning is done (for the planning area boundary, see www.ontario.ca/rural-and-north/far-north-ontario). For detailed information about Far North Land Use Planning and the *Far North Act*, see www.ontario.ca/page/far-north-land-use-planning-initiative.

Across the Far North, many First Nation communities are engaged with Ontario in community-based land-use planning. Together, the planning teams composed of First Nations and Ontario representatives are working on

a range of land-use planning activities, although they are not all at the same stage in the planning process. In northeastern Ontario, in 2024, MINES provided information to support the Community Based Land Use Planning Teams for Constance Lake and Moose Cree First Nations.

Withdrawal Orders

Other work related to Crown land use in the northeast region may include reviews of applications for withdrawal of lands from claim registration under Section 35 of the *Mining Act*. Applications may be for mining rights only, surface rights only and for both mining and surface rights. Reviews by the northeast Regional Land Use Geologist ensure that mineral potential, mineral sector activity and mining-related hazards are identified and considered before decisions are made. In 2024, 3 applications to withdraw Crown mining rights in the northeast region were received and reviewed.

Approved withdrawals are posted on the MINES Web site ([Land Notices, Withdrawals and Reopenings \(gov.on.ca\)](https://landnotices.withdrawalsandreopenings.gov.on.ca)).

MUNICIPAL AND PRIVATE LANDS

The Ministry of Mines supports municipal and private land-use planning through the One Window Planning Service, led by the Ministry of Municipal Affairs and Housing (MMAH), and through the Municipal Plan Review process where a municipality has approval authority. When requested, the northeast Regional Land Use Geologist provides input into, and reviews, draft Official Plans, Official Plan Amendments, draft plans of subdivision and consent (severance) applications to ensure that provincial mineral interests, natural geological hazards and mining-related hazards are appropriately considered in the planning process.

Municipal Planning

The Provincial Policy Statement (PPS), which guides municipal planning in Ontario, is issued under the provisions of the *Planning Act*. The PPS helps to ensure that municipal Official Plans recognize mining operations and areas with significant mineral potential, so that they can be protected from incompatible land uses. The PPS was modified and changes came into effect October 20, 2024. There were no revisions in 2024 directly applicable to the review process of the Regional Land Use Geologist.

As a participant in MMAH's One Window Planning Service for Official Plans and their amendments, the Regional Land Use Geologist provides comments, mineral values mapping, and other input as required for Official Plans and Official Plan Amendments. Where a municipality has approval authority, the Regional Land Use Geologist participates in the Municipal Plan review directly with the municipality for Official Plan amendments and related planning initiatives.

In addition, reviews are completed, and information provided for pre-consultation for consent applications and formal consent applications, and plan of subdivision and/or condominium applications. Although such decisions are normally made by municipal governments, most of the area of the northeast region is outside of towns and cities. In the absence of a municipal government to manage planning decisions related to private land in those areas, decisions are made by the MMAH, with the support of partner ministries, including MINES.

In 2024, the northeast Regional Land Use Geologist provided maps, comments and other input as required for municipal planning activities that included

- 22 consent (severance) and plan of subdivision and/or condominium applications in 3 single-tier municipalities and 7 unorganized geographic townships or areas

- 6 Official Plans and related planning initiatives (such as Official Plan amendments, zoning by-laws, and minor variances) in 1 community
- 8 new draft Official Plans or Official Plan updates

The municipalities involved in these planning initiatives are listed in Table 18.

Table 18. Municipal planning initiatives with MINES input, northeastern Ontario, 2024.

Consent (Severance) and Subdivision Applications
Consent, Mattawan Twp, East Nipissing Planning Board (2)
Consent, Maisonville, Unincorporated Township (2)
Consent, Lebel, Unincorporated Township
Consent, Knicely, Unincorporated Township
Consent, Tarbutt Additional, Desbarats to Echo Bay Planning Board
Consent, Tarbutt, Desbarats to Echo Bay Planning Board
Consent, Harris, Unincorporated Township
Consent, Otto, Unincorporated Township (2)
Consent, Eby, Unincorporated Township
Consent, Grenfell, Unincorporated Township (2)
Consent, Robb, City of Timmins (3)
Consent, Tisdale, City of Timmins
Consent, Godfrey, City of Timmins
Consent, Mountjoy, City of Timmins
Consent, Matheson, City of Timmins
Subdivision, Tisdale, City of Timmins
Completed/Draft/Reviewed Official Plans
Draft Official Plan, Municipality of Huron Shores
Official Plan review, Town of Blind River
Official Plan, Town of Cobalt
Official Plan review, Town of Moonbeam
Official Plan review, Sault Ste. Marie North Planning Area
Official Plan review, West Nipissing
Official Plan review, Township of Coleman
Official Plan review, Town of Mattawa
Official Plan–Related Initiatives
Zoning by-law amendment, City of Timmins (6)
Additional Municipality Related Activities Undertaken in 2024
Information, Bucke, Temiskaming Shores
General guidance, Tisdale, City of Timmins
Site Plan Control, Whitney, City of Timmins

Exemptions from Mining Tax

Section 189 (1) of the *Mining Act* allows owners of patented land to apply for exemption from paying mining tax. Key factors that are considered when applications are reviewed include whether or not the lands are being used for mining-related purposes, and whether or not there would be third-party interest in using the lands for mining-related purposes (e.g., the surrounding lands are being explored or the sites in question have provincially significant mineral potential).

During 2024, no applications were received.

FIRST NATIONS

In addition to doing work related to Far North land-use planning, the northeast Regional Land Use Geologist provided information on mineral occurrence sites, past or present mining and exploration activity, geology and mineral potential for 2 Aboriginal Title Claim areas.

Other Activities

The northeast Regional Land Use Geologist accompanied other RGP staff on 2 general interest field trips in 2024, as well as undertaking additional activities as outlined in the following sections.

CLASS ENVIRONMENTAL ASSESSMENTS

Class Environmental Assessments (“Class EAs”) are documents that set out a standard environmental assessment process to evaluate the potential environmental effects of a project. There are currently 11 Class EAs in effect in Ontario (www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information), relating to the development of new infrastructure, such as dams, transmission lines, pipelines, highway corridors, commuter rail stations and bus terminals, and sewer and water facilities; the establishment of new parks and conservation reserves; forest management plans; and Crown land dispositions.

In 2024, 3 Class EAs were received for comment.

ENVIRONMENTAL REGISTRY

The Environmental Registry of Ontario (ERO) is an online resource that contains public notices about environmental matters being proposed by all Ontario government ministries covered by the Environmental Bill of Rights. The public notices contain information about proposals including new acts, regulations, policies and programs; plans to change or eliminate existing ones; and plans to issue permits for a wide range of activities across Ontario.

The northeast Regional Land Use Geologist sifts through the Environmental Registry and creates a spreadsheet for other workers of the ministry and other ministries for any items that would regard land-use planning under the geology lens on a monthly basis.

In 2024, most of the ERO postings relevant to northeastern Ontario were related to aggregate licences issued under the *Aggregate Resources Act*, notices of approval or amendments to Municipal Official Plans, Minister’s Zoning Orders, and Provincial Park management, not requiring comments by the Regional Land Use Geologist.

Other province-wide items included postings regarding modernizing Ontario’s environmental assessment program, regulatory amendments for increased soil reuse, support for building homes and transit faster, review of proposed policies for a new provincial planning policy instrument, cutting red tape to build more homes, changes to the *Aggregate Resources Act*, expanding protected areas in Ontario, regulation of commercial-scale geologic carbon storage projects, and reducing gridlock.

POLICY AND GUIDANCE

In July 2024, the Regional Land Use Geologists provided comments to the Land Use Planning and Policy Co-ordinator on proposed amendments to the Provincial Planning Statement with respect to possible impact on MINES land use planning interests. The new Provincial Policy Statement came into effect on October 20, 2024.

CONFERENCES AND OUTREACH ACTIVITIES

In 2024, the northeast Regional Land Use Geologist attended or participated in the following events.

In person:

- 2024 Resident Geologist Program Health and Safety and Field Training Week in Belleville and Tweed, including an introduction to Tweed and Madoc area geology.
- Northeast Ontario Mines and Minerals Symposium – conference in Timmins.
- Organization for Economic Co-operation and Development – Mining Regions Conference in Sudbury with field trip.

Virtual meetings and conferences:

- Ontario Geological Survey Virtual Showcase 2024 – a series of technical presentations over 3 days featuring results of geoscience projects in progress by the Ontario Geological Survey, summaries of activities in all districts of the Resident Geologist Program, and updates on OGS data sets and online applications. A presentation titled “Natural Geological Hazards and Land Use Planning” was created and presented by the Regional Land Use Geologists. The northeast Regional Land Use Geologist participated in the organization of Showcase.
- Kawartha Region Earth Sciences, Engineering and Metallurgy Network (KREEM) – monthly presentations and discussions on various aspects of geoscience, environment and engineering.

MINERAL INVENTORY GEOSCIENTIST ACTIVITIES —NORTHEASTERN AND SOUTHERN ONTARIO

The Ontario Mineral Inventory (OMI) database is a dynamic compilation of over 18 900 records describing most of the known mineral occurrences in Ontario. It is an important reference tool for explorationists interested in exploring and acquiring mining properties in Ontario. When used in conjunction with other spatial databases generated by the Ontario Geological Survey (OGS), it provides additional tools for making mineral discoveries in Ontario.

The Mineral Inventory Geoscientists (MIG) investigate and document mineral deposits and occurrences across the province. Through field visits, comprehensive literature research and personal research, they work with regional and district Resident Geologist Program staff to ensure that the OMI database is regularly updated. Regular updates are required to ensure that the Ministry of Mines is using the most up-to-date information in making land-use planning and policy decisions and that mineral industry clients have access to comprehensive and up-to-date records. Records for certain areas are reviewed and updated in support of bedrock mapping and other field work conducted by the Earth Resources and Geoscience Mapping Section (ERGMS) of the Ontario Geological Survey (OGS).

Several targeted OMI data improvement projects were in progress throughout the year, including a review of Producing and Past-Producing Mine OMI records in southern Ontario. This project was undertaken to review the records with a Producing Mine status and to determine if they are currently producing, or if their status should be changed. The OMI records with a Past-Producing Mine status are being reviewed to determine if there was sufficient historical production for each OMI record to be classified as a past-producing mine, or if they should be downgraded to a different status to better reflect the history, production and information available.

In the spring of 2023, a group of ministry staff came together to review and update the OMI category definitions and associated “threshold grades” (or cut-off values) because these were last reviewed and revised by Wilson et al. (2008). Critical commodities, without a previously set occurrence grade, were added during this process: antimony, barite, beryllium, bismuth, cesium, gallium, germanium, indium, lithium, niobium, rubidium, scandium, selenium, tantalum, tellurium, yttrium and zirconium. With the implementation of the new and updated grades, more than 2000 OMI records were identified and will be examined to determine if they still meet the requirements as an OMI “Occurrence”. This examination process is ongoing. In 2024, examinations were completed for OMI “Occurrence” records with the following critical commodities: antimony, beryllium, cesium, gallium, germanium, indium, lithium, niobium, rare earth elements, rubidium, scandium, tantalum, thorium and yttrium. The OMI category definitions document (“OMI Definitions and cut-off values.pdf”) is part of the Ontario Mineral Inventory GIS data that can be downloaded from the GeologyOntario Hub (<https://geology-ontario-en-mndm.hub.arcgis.com>).

For 2024, Sheree Hinz was the northeastern and southern Ontario MIG.

Total contributions to the OMI database for northeastern and southern Ontario in 2024 included 1118 updated records, 270 records deleted and 23 new records. A breakdown of the northeastern and southern Ontario records revised by district is provided in Table 19.

Table 19. Ontario Mineral Inventory records revision in northeastern and southern Ontario in 2024.

Resident or District Office	Updates	Deletions	New
Kirkland Lake	123	4	12
Sault Ste Marie	41	1	3
Southern Ontario	795	261	2
Sudbury	99	4	2
Timmins	60	0	4
Total	1118	270	23

GEOGRAPHIC INFORMATION SYSTEM DATA SPECIALISTS ACTIVITIES—NORTHWESTERN AND NORTHEASTERN ONTARIO

The Resident Geologist Program’s (RGP) Geographic Information System (GIS) Data Specialist positions are based in the Thunder Bay and Tweed offices and serve the northwest RGP region and northeast and southern RGP regions, respectively. In 2024, Genevieve Meyer held the Thunder Bay position until July 10, after which she took on an acting role as Initiatives Coordinator, Strategic Support Unit (Mines and Minerals Division). During her acting role, Genevieve continued to extract, compile and release data monthly for the RGP. Angela McEachern filled the Thunder Bay position beginning in November 2024. The Tweed position is staffed by Nazha Sabiri; this position was vacant from February to August 2024 while Nazha acted as the Northwestern Ontario Mineral Inventory Geoscientist. The GIS Data Specialists create maps and graphics, manage geospatial data and conduct data analysis for land-use planning, geoscience compilations, reports, posters and presentations. They provide ongoing GIS support to the RGP and assist clients with accessing geoscience data.

Ontario Assessment File Database, Ontario Drill Hole Database and Ontario Mineral Inventory

The Ontario Assessment File Database (OAFD), Ontario Drill Hole Database (ODHD) and Ontario Mineral Inventory (OMI) are updated continuously by RGP staff using the Ontario Mineral Exploration Information System (OMEIS). An intranet-based application, OMEIS was launched in 2018 and is used by RGP and Mining Lands staff to maintain, update and correct assessment file and drill-hole data.

Updated information and new files are accessible through the GeologyOntario search tool almost immediately following data entry. Data entry is carried out mainly by the District Geological Assistants. The GIS Data Specialists are responsible for the administration of OMEIS, the creation of GIS data for the assessment files and drill holes, as well as corrections to the geospatial data of existing assessment files.

The GIS Data Specialists extract the tabular and spatial data at the beginning of each month and compile it for release in 2 different formats:

1. a graphical interface or data layer (keyhole mark-up language (.*kml*) file) through OGSEarth (www.ontario.ca/ogsearth), which can be viewed using geographic information applications, such as Google Earth™ mapping service
2. a compressed (.*zip*) downloadable file on GeologyOntario (www.hub.geologyontario.mines.gov.on.ca)

A summary of data added to or updated in OMEIS in 2024 is provided in Table 20.

Table 20. Ontario Mineral Exploration Information System (OMEIS) data entry statistics for assessment files and diamond-drill hole data for 2024.

File Type	New Files Added	Existing Files Updated	New Drill Holes Added	Existing Drill Holes Updated
Approved Assessment	617	2096	3114	430
Non-Assessment Exploration Work	0	67	0	11
Total	617	2163	3114	441

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Ontario Geological Survey Resident Geologist Program

**Timmins Regional Resident Geologist
(Sault Ste. Marie District)—2024**

by

B.K. Maity and V. Gagnon-Coderre

2025

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Timmins Regional Resident Geologist (Sault Ste. Marie District)—2024

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INTRODUCTION

The Sault Ste. Marie District comprises part of the Archean Superior Province to the north and the Paleoproterozoic Southern Province to the south, with a localized area of Ordovician rocks at the southern extremity of the District (Figure 1). The Archean Superior Province within the District includes the Wawa Subprovince, encompassing several greenstone belts, supracrustal rocks and granitoid–gneiss intrusive complexes that are separated from the southern Abitibi Subprovince to the east by the Kapuskasing Structural Zone. The Southern Province consists mainly of the Paleoproterozoic Huronian Supergroup (metasedimentary and associated metavolcanic rocks) and intrusive dikes and sills. Additionally, the western part of the District has outcrops of the Late Mesoproterozoic to Early Neoproterozoic Keweenaw Supergroup of supracrustal and associated intrusive rocks, related to the Midcontinent Rift, that are exposed along the eastern flank of Lake Superior. All the major geologic units in the District have a rich history of mineral exploration and mining activities that continue to this day. The Early to Middle Ordovician sedimentary sequences, exposed in St. Joseph Island to the south of Sault Ste. Marie, are currently not undergoing any mineral exploration activity.

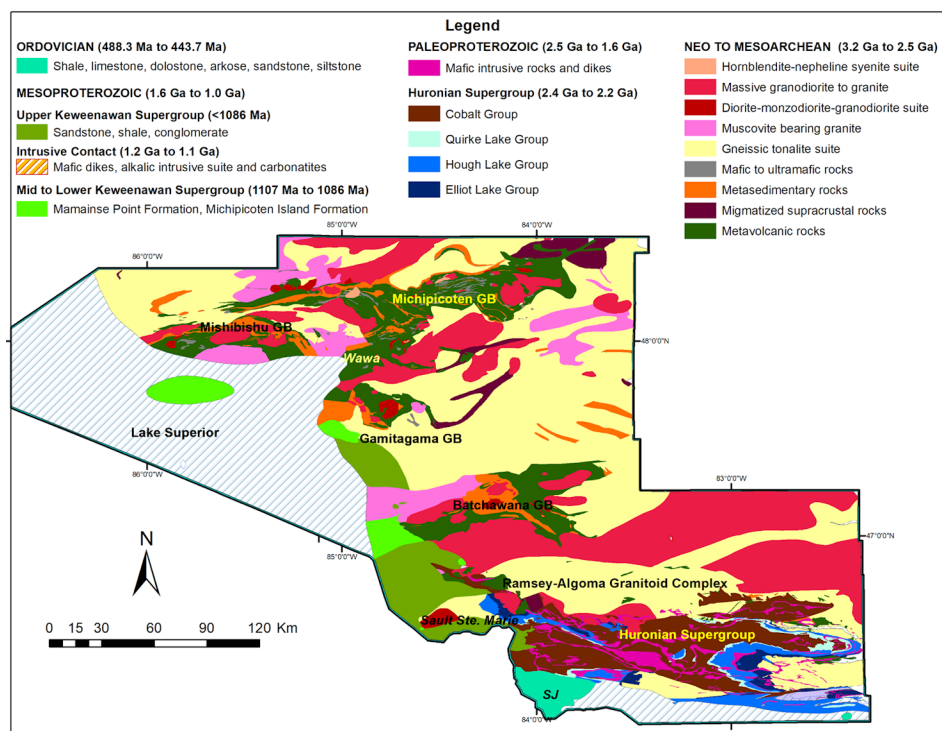


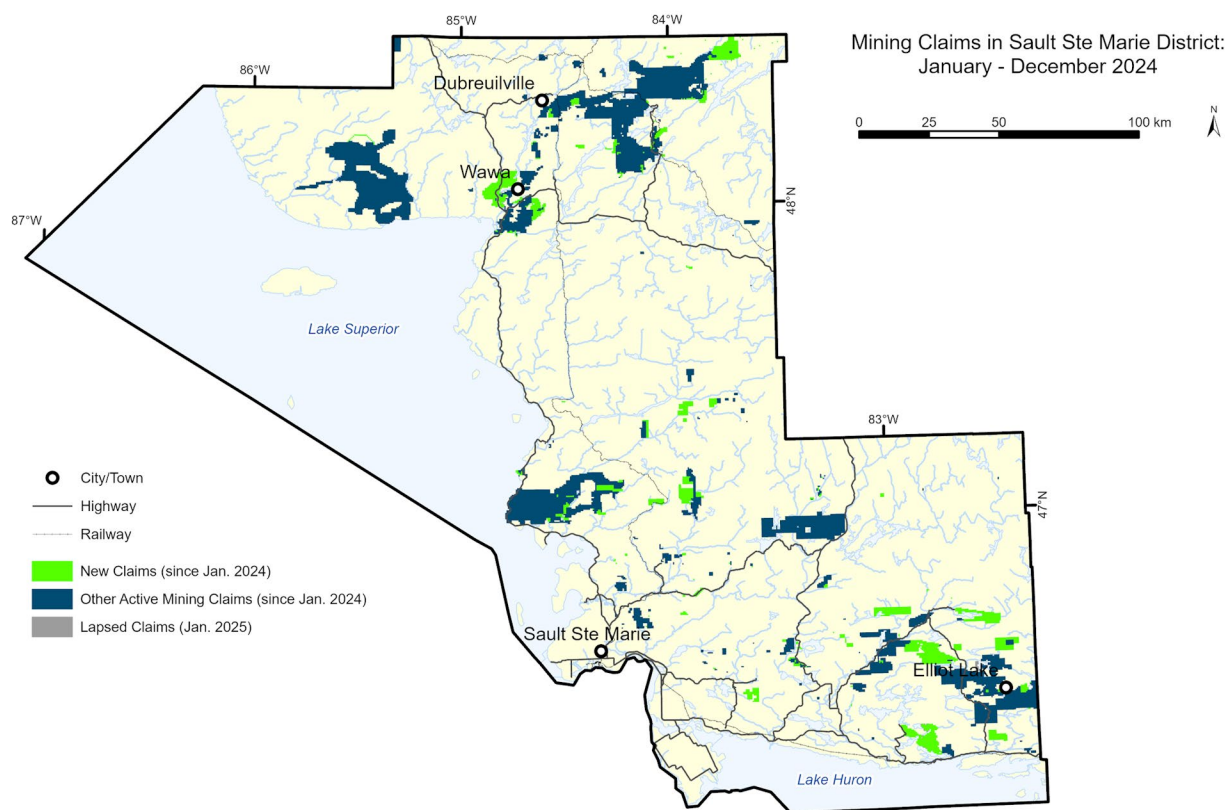
Figure 1. Geological map of the Sault Ste. Marie Resident Geologist District showing major bedrock units (map *modified after* Ontario Geological Survey 2011). **Abbreviations:** GB, greenstone belt; SJ, St. Joseph Island.

Table 1. Total land area covered by active mining claims in the Sault Ste. Marie Resident Geologist Program (RGP) District from January 6, 2020, to January 4, 2024.

RGP District	Total area (ha) covered by claims January 1, 2025	Total area (ha) covered by claims January 5, 2024	Total area (ha) covered by claims January 4, 2023	Total area (ha) covered by claims January 4, 2022
Sault Ste. Marie	374 483	340 880	340 918	301 733

Note: Data are from MLAS, compiled by Nazha Sabiri, Geographic Information System Data Specialist – Northeast and Southern Ontario, Resident Geologist Program.

During 2024, gold was produced from 3 mines in the Archean greenstone belts in the Sault Ste. Marie District. Orogenic gold, intrusion-related gold (IRG), banded iron formation (BIF)-hosted gold, volcanogenic massive sulphides (VMS), magmatic nickel-copper-platinum group element (PGE) deposits, vein-hosted silver-lead-molybdenum, and Huronian Supergroup-hosted uranium and rare earth elements were the major mineralizing systems targeted by exploration in 2024. As of January 1, 2025, a total area of 374 483 ha (Table 1; Figure 2) was covered by active mining claims in the Sault Ste. Marie District, as recorded in the Mining Lands Administration System (MLAS). There was a total of 14 428 revised claims up to December 31, 2024, and 2243 new claims covering 75 277 ha between January 1 and December 31, 2024.

**Figure 2.** Mining claims map for 2024 in Sault Ste. Marie District.

MINING ACTIVITY

Gold production in the Sault Ste. Marie District came from 3 operating mines in 2024 (Figure 3): the Island Gold and Magino Mines, operated by Alamos Gold Inc., and the Eagle River Mine, operated by Wesdome Gold Mines Ltd. Total gold production was 282 562 ounces of Au at an average head grade of 9.02 g/t Au (Table 2).

Table 2. Total gold production in the Sault Ste. Marie District, 2024 (Alamos Gold Inc., news release, February 19, 2025, and Wesdome Gold Mines Ltd., news release, January 14, 2025).

Mines	Ore Milled (tonnes)	Average Head Grade (g/t Au)	Production (oz)	Township or Area (Commodity)
Alamos Gold Inc.				
Island Gold Mine	392 460	12.47	155 000	Finan (gold)
Magino Mine	1 165 551	0.91	33 000	Finan (gold)
Wesdome Gold Mines Ltd.				
Eagle River Mine	222 526	13.7	94 562	Point Isacor (gold)
Total	1 780 537	9.02	282 562	

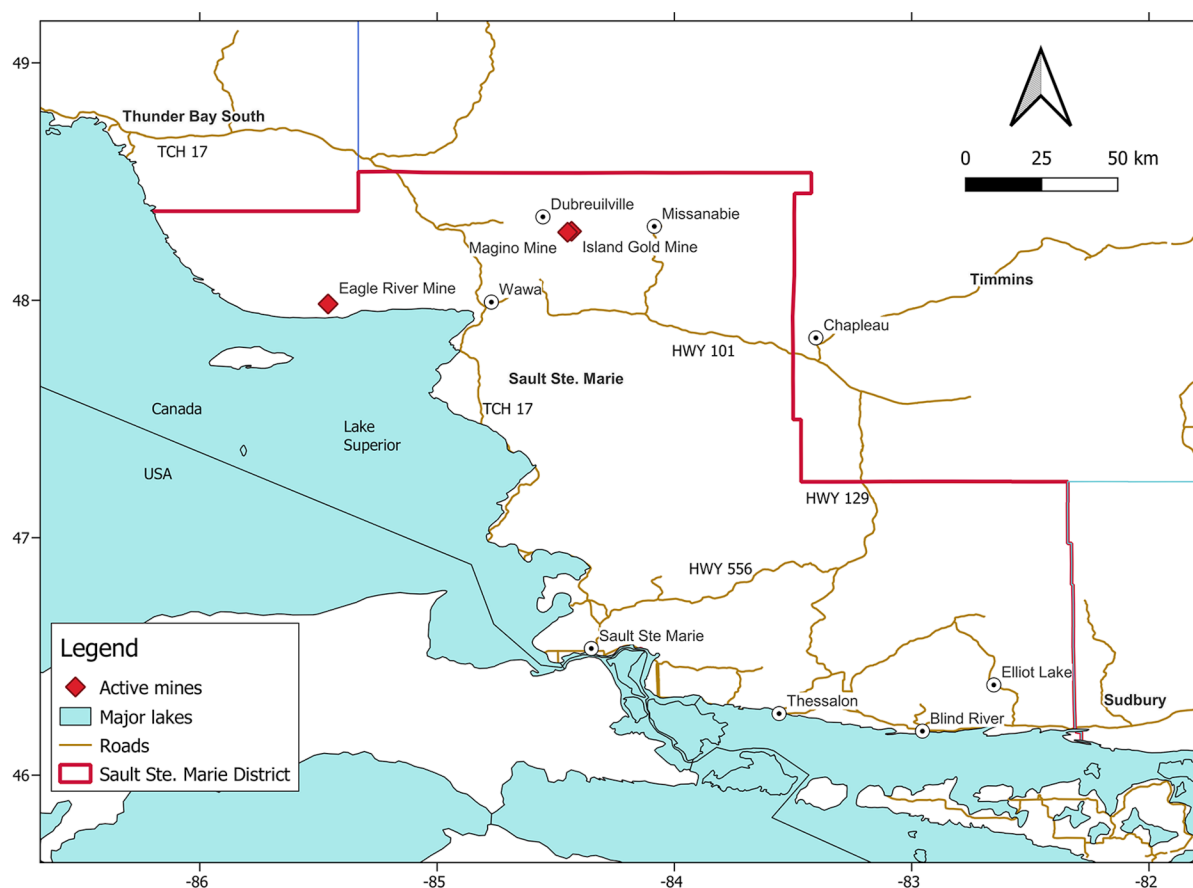


Figure 3. Map showing locations of operational mines in 2024 in Sault Ste. Marie District (see Table 2). **Abbreviation:** TCH, Trans-Canada Highway. Latitude and longitude values are shown on the vertical and horizontal borders of the figure, respectively.

Alamos Gold Inc. – Island Gold and Magino Mines

The Island Gold Mine is an underground mine located in Finan and Jacobson townships, approximately 83 km northeast of the town of Wawa (see Figure 3) and consists of 831 mining tenures, covering approximately 14 930 ha. It is accessible via Goudreau Road, which connects to Highway 519 and the Trans-Canada Highway 17 (Bourgeault et al. 2022). Underground operations at the mine are currently accessed by a ramp system, and longitudinal retreat long-hole stopes are used as the primary mining method.

Table 3. Gold production data from the Island Gold Mine between 2020 and 2024 (Alamos Gold Inc., news release, February 21, 2024).

	2024	2023	2022	2021	2020
Ore mined (tonnes)	396 686	437 541	420 801	438 731	412 169
Head grade (g/t)	12.39	9.43	10.03	10.27	11.18
Ore milled (tonnes)	392 460	439 008	456 592	435 297	386 591
Head grade (g/t)	12.47	9.48	9.64	10.35	11.62
Production (oz)	155 000	131 400	133 700	140 900	139 000

In mid-2024, Alamos announced acquisition of Argonaut Gold's Magino Mine property adjacent to Island Gold Mine (Alamos Gold Inc., news releases, March 27 and July 12, 2024). The acquisition expanded land package, mineral reserves and resources, merging 2 operations into one of the largest and lowest cost gold mines in Canada. It also increased capital savings by US\$ 140 million through integration of a centralized mill and tailings facility at Magino, increasing mineral production to over 600 000 ounces per year (Alamos Gold Inc., news release, March 27, 2024). The Magino Project consists of 18 patented mining claims, 61 leased mining claims and 14 unpatented mining claims, covering an area of 2213 ha in Finan Township, approximately 40 km northeast of the town of Wawa (see Figure 3).



Figure 4. Underground exploration drilling activity at the Island Gold Mine. Longitudinal section through C- and E1E-Zones showing underground exploration drilling results (from Alamos Gold Inc., news release, July 23, 2024).

In 2024, total ore mined was 396 686 tonnes at an average grade of 12.39 g/t of Au. Total reported gold production was 155 000 ounces of Au from a total of 392 460 tonnes of ore milled at an average head grade of 12.47 g/t of Au (Table 3; Alamos Gold Inc., news release, February 19, 2025). The revised guidance for consolidated gold production (including Magino and Island Gold Mines) for the next 3 years at the Island Gold District is 185 000 to 205 000 ounces for 2024, 275 000 to 300 000 ounces for 2025, and 330 000 to 355 000 ounces for 2026 (Alamos Gold Inc., news release, September 12, 2024).

The Island Gold property is within the Michipicoten greenstone belt and consists of mainly greenschist to amphibolite facies volcanic and metasedimentary rocks that form a homocline sequence younging to the north. Regionally, tight to isoclinal folds exhibit axial planar foliation trending 070 to 095°. The mine is situated within felsic metavolcanic rocks, including tuffs and lavas, and is positioned on the northern limb of the Goudreau anticline (Bourgeault et al. 2022; Sage 1994). The Magino property is underlain by intermediate to felsic metapyroclastic rocks capped by pyrite-bearing ironstone and pillowed, massive to schistose, mafic to intermediate metavolcanic rocks, intercalated with minor mafic pyroclastic rocks and intruded by several medium- to coarse-grained quartz diorite sills and dikes. An intrusion-related gold deposit on the property is primarily hosted by the Webb Lake stock, a felsic intrusion that dips steeply to the north and strikes east to northeast (Marek et al. 2022).

Updated Measured and Indicated Resources of Island Gold Mine, as of December 31, 2024, were estimated to be 2 113 000 tonnes, with a head-grade of 8.76 g/t Au, producing a total of 601 000 ounces of Au, whereas the Inferred Resource was 7 106 000 tonnes, with a gold production of 3 774 000 ounces of Au, at a head-grade of 16.52 g/t Au (Alamos Gold Inc., news release, February 18, 2025). The total Proven and Probable Reserve estimate, as of December 31, 2024, was 6 232 000 tonnes, with a gold production of 2 285 000 ounces, at a head-grade of 11.40 g/t Au (Alamos Gold Inc., news release, February 18, 2025).

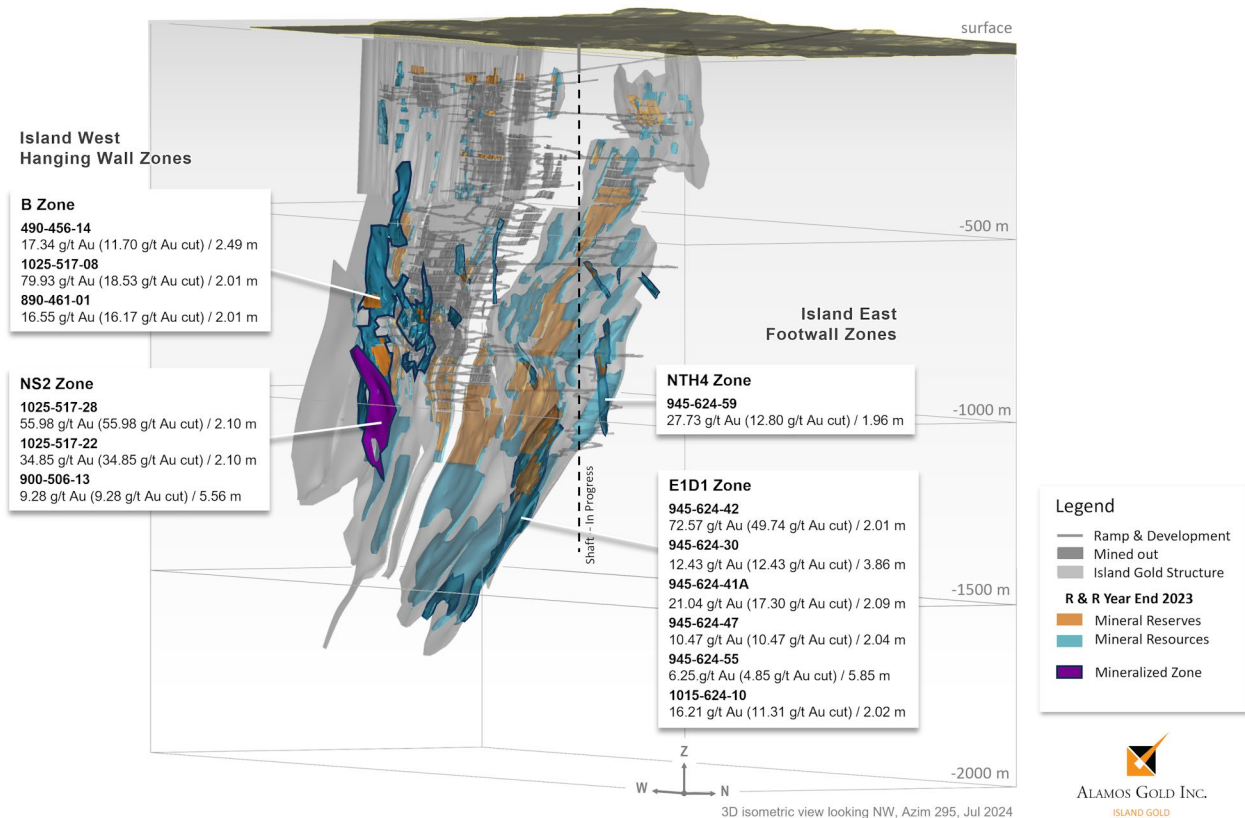


Figure 5. New underground exploration drilling in the hanging wall and footwall zones in Island Gold Mine (from Alamos Gold Inc., news release, July 23, 2024).

Updated Measured and Indicated Resources of Magino Mine, as of December 31, 2024, were estimated to be 62 689 000 tonnes, with a head-grade of 0.94 g/t Au, producing a total of 1 905 000 ounces of Au, whereas the Inferred Resource was 40 383 000 tonnes, with a gold production of 1 177 000 ounces of Au, at a head-grade of 0.91 g/t Au (Alamos Gold Inc., news release, February 18, 2025). The total Proven and Probable Reserve estimate, as of December 31, 2024, was 68 400 000 tonnes, with a gold production of 2 008 000 ounces, at a head-grade of 2.26 g/t Au (Alamos Gold Inc., news release, February 18, 2025).

Exploration activities focussed on both surface and underground drilling, extending high-grade gold mineralization at depth and parallel to the existing gold-bearing structures in Island West (E1E-Zone), Island East (C-Zone) and Island West Hanging Wall (B-Zone), and defining additional mineral reserves and resources in the Island Gold hanging wall and footwall zones (e.g., NS1, E1D1, E1D zones) (Figures 4 and 5; Alamos Gold Inc., news releases, February 13 and July 23, 2024). The near mine expansion program at the Island Gold district indicated high-grade gold mineralization in surface drilling that was completed to the north and west of the Island Gold deposit, within the North Shear and newly acquired Magino project areas, including Webb Lake stock and Magino open pit (Figure 6; Alamos Gold Inc., news release, July 23, 2024).

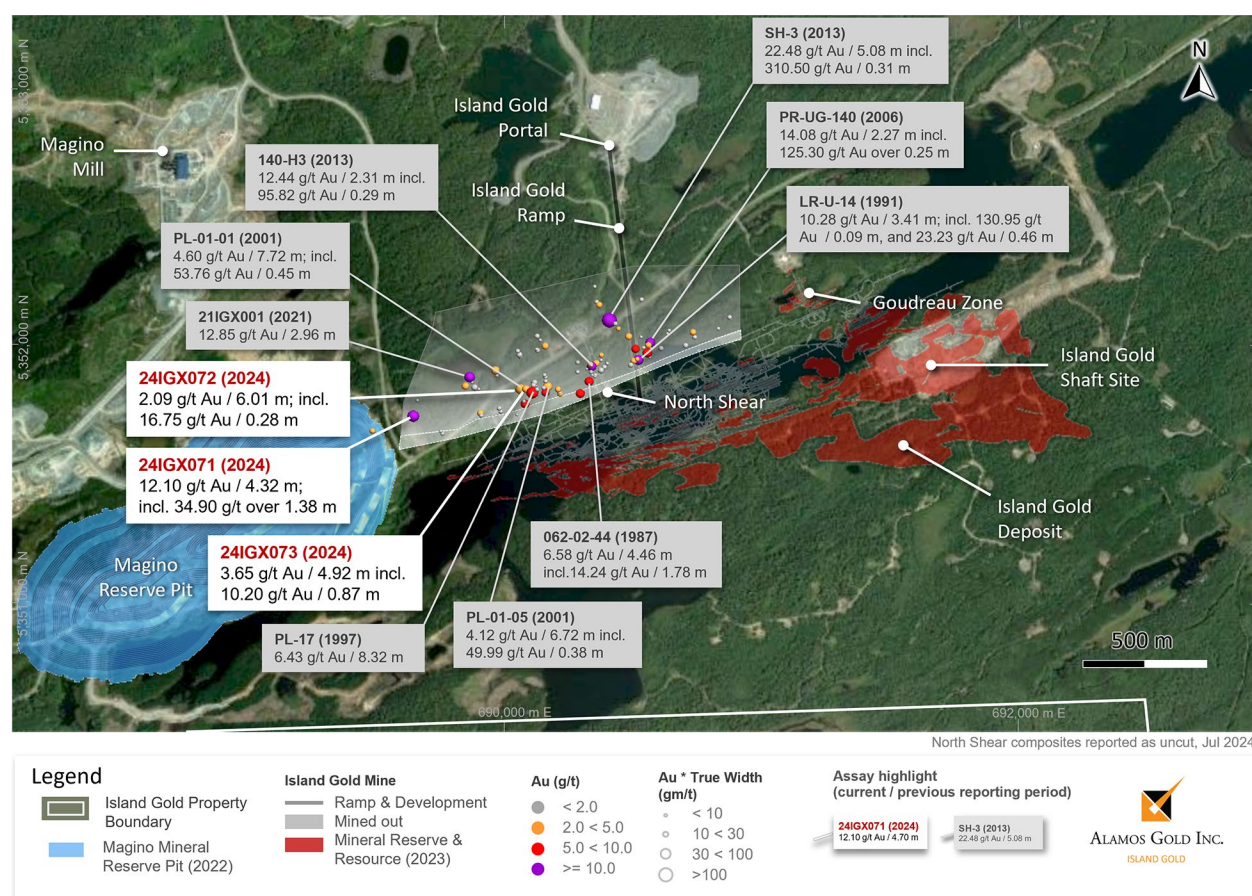


Figure 6. Plan map of new and historical drilling results at North Shear, Island Gold district (from Alamos Gold Inc., news release, July 23, 2024).

Wesdome Gold Mines Ltd. – Eagle River Mine

Wesdome Gold Mines Ltd. operates the Eagle River underground mine, hosted in the Mishibishu greenstone belt, Point Isacor area, approximately 50 km west of Wawa (*see* Figure 3). The mine has been in production since 1996; operations are currently accessed by a ramp system, and the primary mining method is long-hole stoping, with a typical sublevel interval of 15 m between levels. Ore is processed at the Mishi mill, which has a processing capacity of 1200 tonnes per day. In 2024, total gold production from the Eagle River Mine increased 7.7%, resulting in 94 562 ounces of Au from 222 526 tonnes of ore milled at an average grade of 13.7 g/t Au, the highest in the mine's history of production (Wesdome Gold Mines Ltd., news release, January 14, 2025).

Table 4. Eagle River Mine Proven and Probable mineral reserves and Inferred, Indicated and Measured mineral resources as of December 31, 2023 (Wesdome Gold Mines Ltd., news release, March 12, 2024).

Category	Tonnes (‘000s)	Grade (g/t gold)	Contained Au (oz)
Proven	247	20.43	162 000
Probable	452	15.94	232 000
Stockpile and Inventory	17	11.27	6
Proven + Probable	716	16.3	400 000
Measured	201	10.8	70 000
Indicated	570	9.6	176 000
Measured + Indicated	771	9.9	246 000
Inferred	2 858	3.8	349 000

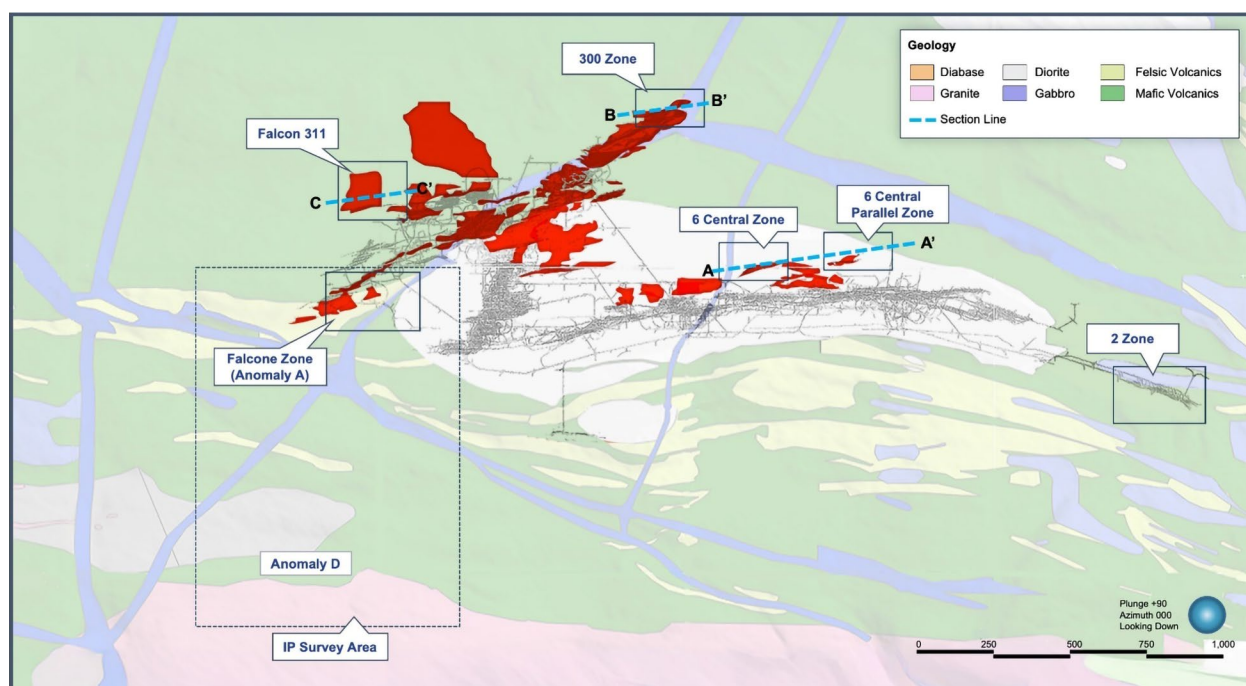


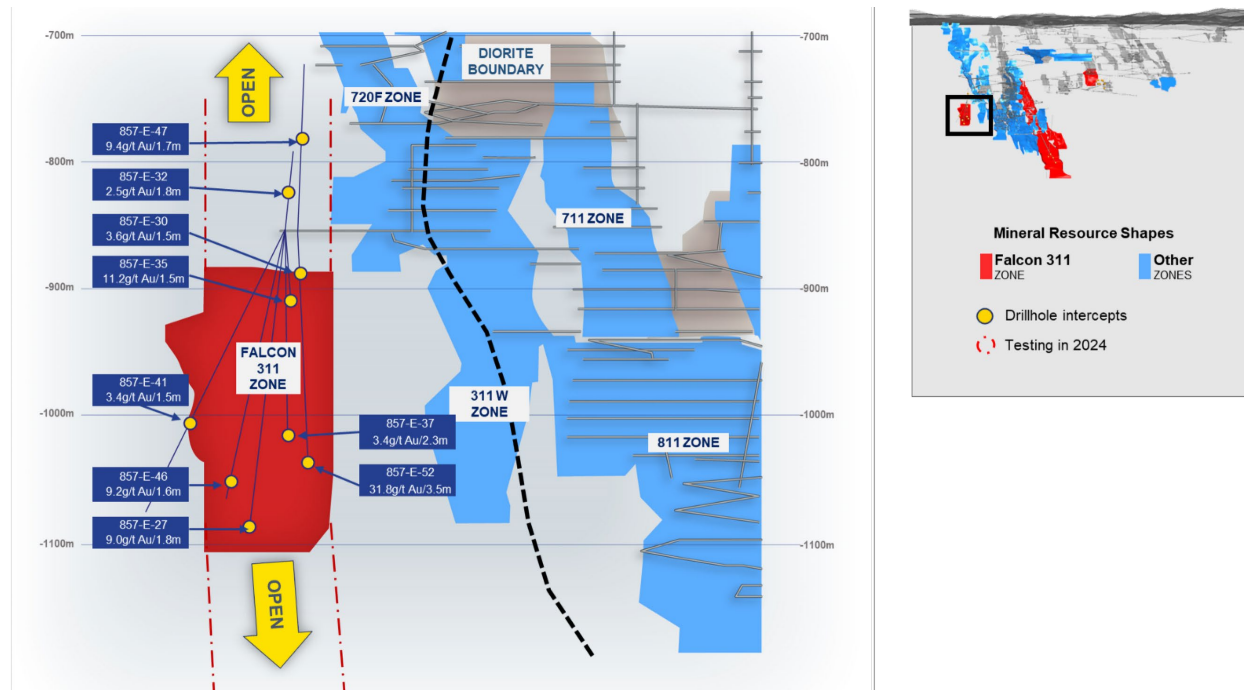
Figure 7. Plan view of Eagle River Mine infrastructure, tilted to the south, showing key exploration targets, mineralized zones, along with the area for the IP survey, shown in Figure 11 (*from* Wesdome Gold Mines Ltd., news release, January 21, 2025).

Table 5. Gold production data from the Eagle River mine between 2020 and 2024 (Wesdome Gold Mines Ltd., news release, January 14, 2025).

	2024	2023	2022	2021	2020
Ore milled (tonnes)	222 526	228 777	246 887	228 759	196 441
Head grade (g/t Au)	13.7	12.4	10.7	13.8	14.2
Production (oz Au)	94 562	87 799	82 002	99 120	87 560

In March 2024, Mineral Resources and Mineral Reserves for the Eagle River Mine, as of December 31, 2023, was released (Wesdome Gold Mines Ltd., news release, March 12, 2024). The latest Proven plus Probable mineral reserve estimate for the Eagle River Mine is 716 000 tonnes of ore, producing 400 000 ounces of gold, at a head grade of 17.38 g/t Au (Table 4). The Measured and Indicated mineral resources for the Eagle River underground mine is 771 000 tonnes of ore, producing 246 000 ounces of gold, with a grade of 9.9 g/t Au. Inferred mineral resources is 2 858 000 tonnes of ore, producing 349 000 ounces of gold, with a grade of 3.8 g/t Au (*see* Table 4). The 2025 gold production guidance for Eagle River Mine was 100 000 to 110 000 ounces of gold, at a head grade of 13.0 to 15.0 g/t Au (Wesdome Gold Mines Ltd., news release, January 14, 2025). Gold production data from the Eagle River Mine between 2020 and 2024 are shown in Table 5.

The mine geology is associated with steep, northerly dipping sequences of tholeiitic basalts and calc-alkalic andesites with minor clastic sedimentary rocks, including chert–magnetite-bearing iron formation. Gold is primarily hosted in quartz veins emplaced along the regional deformation zones that follow a volcano-sedimentary contact along the south limb of a fold system (*see* Maity, Swiercz and Adrianwalla 2024).

**Figure 8.** Longitudinal section view of underground drilling at Falcon 311 Zone in Eagle River Mine (*from* Wesdome Gold Mines Ltd., news release, July 3, 2024).

In 2024, Wesdome completed 105 000 m of surface and underground exploration drilling that delineated and expanded key mineralized zones near existing mine infrastructure (e.g., Falcon 311 Zone, 6 Central Zone, 300 Zone), completed geophysical surveys, and identified new targets (Figure 7; Wesdome Gold Mines Ltd., news release, January 21, 2025). Exploration drilling at the west side of the Mine Diorite expanded the newly discovered Falcon 311 Zone in all directions, with drilling intersections returning 269.6 g/t Au over 2.3 m core, including 1261 g/t Au over 0.5 m, 53.0 g/t Au over 2.9 m core, 24.7 g/t Au over 2.0 m core, 33.0 g/t Au over 5.0 m core, and 19.1 g/t Au over 2.0 m core (Figure 8; Wesdome Gold Mines Ltd., news releases, February 20 and July 3, 2024, and January 21, 2025). Drilling in 6 Central Zone extended the high-grade ore zone 150 m to the east, in down-plunge direction, and returned 71.7 g/t Au over 3.3 m core, 93.7 g/t Au over 3.0 m core, 180.0 g/t Au over 2.4 m, and 167.6 g/t Au over 1.7 m core. Additionally, infill and delineation drilling in 300 Zone returned 39.7 g/t Au over 8.7 m core, 33.4 g/t Au over 4.7 m core, and 36.4 g/t Au over 4.0 m core (Figures 9 and 10; Wesdome Gold Mines Ltd., news releases, July 3, 2024, and January 21, 2025). An induced polarization (IP) survey revealed multiple highly chargeable areas that are similar to the Falcon Zone. These areas were drill tested in December 2024 and assay results are pending (Figure 11; Wesdome Gold Mines Ltd., news release, January 21, 2025).

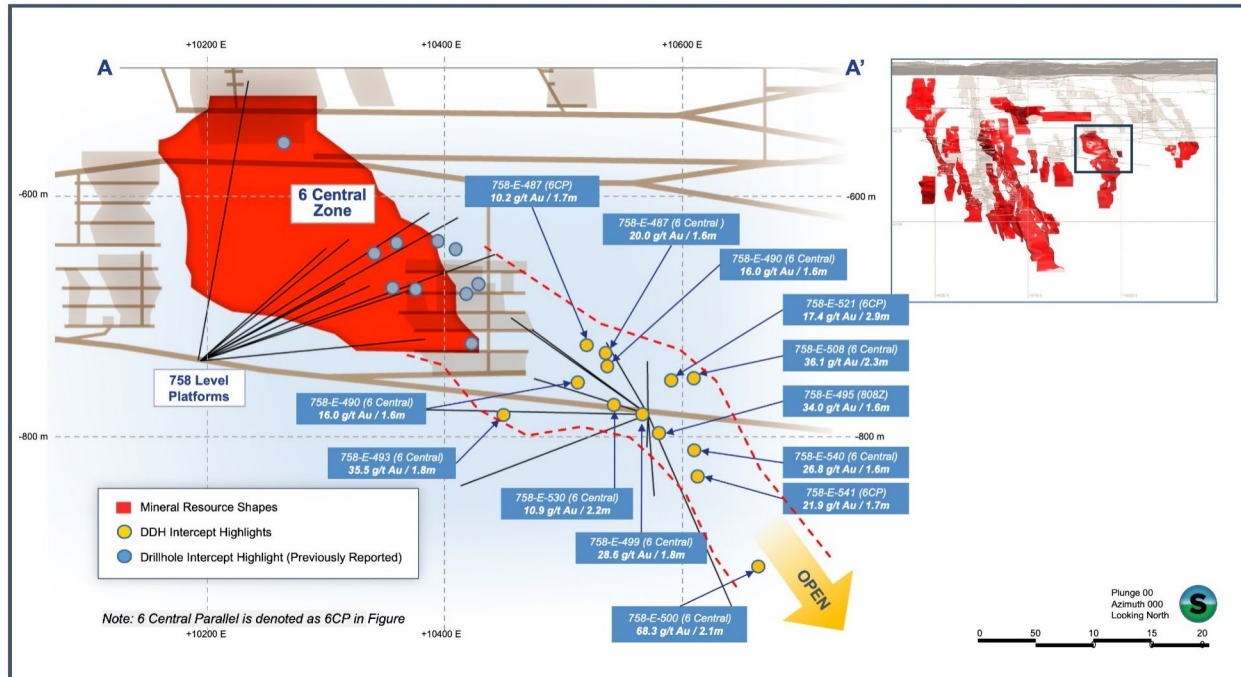


Figure 9. Longitudinal section view of underground exploration drilling at 6 Central Zone in Eagle River Mine (from Wesdome Gold Mines Ltd., news release, January 21, 2025).

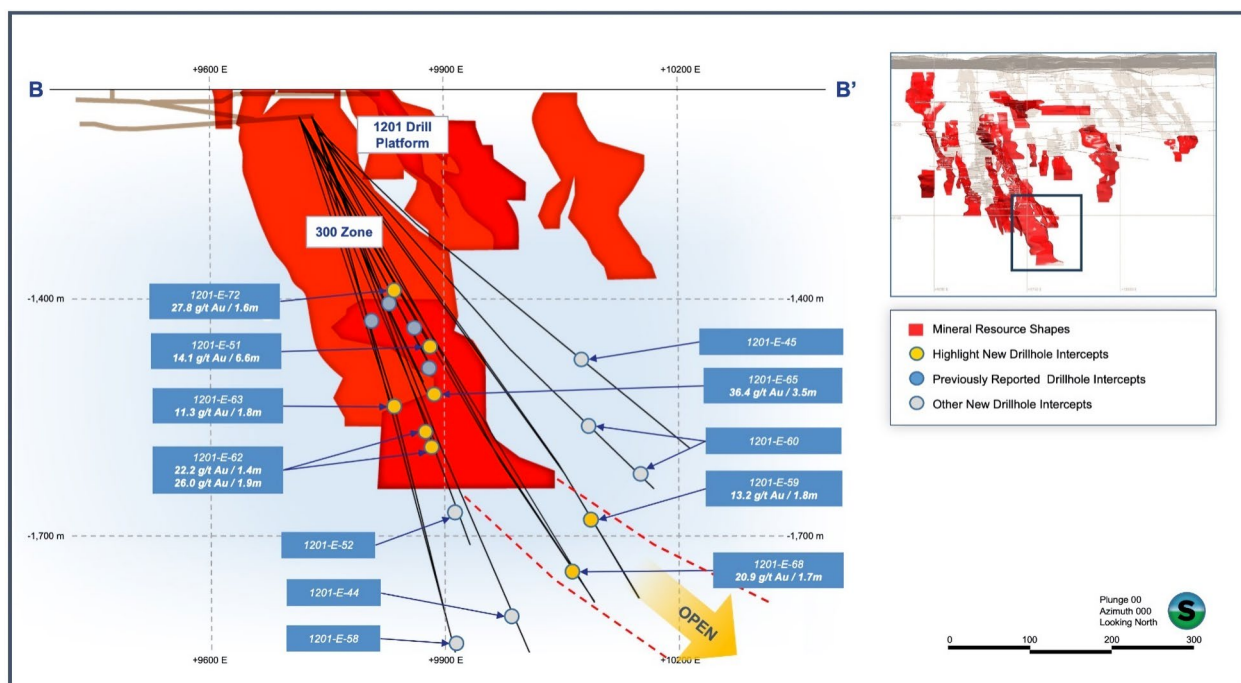


Figure 10. Longitudinal section view of underground exploration drilling at 300 Zone in Eagle River Mine (from Wesdome Gold Mines Ltd., news release, January 21, 2025).

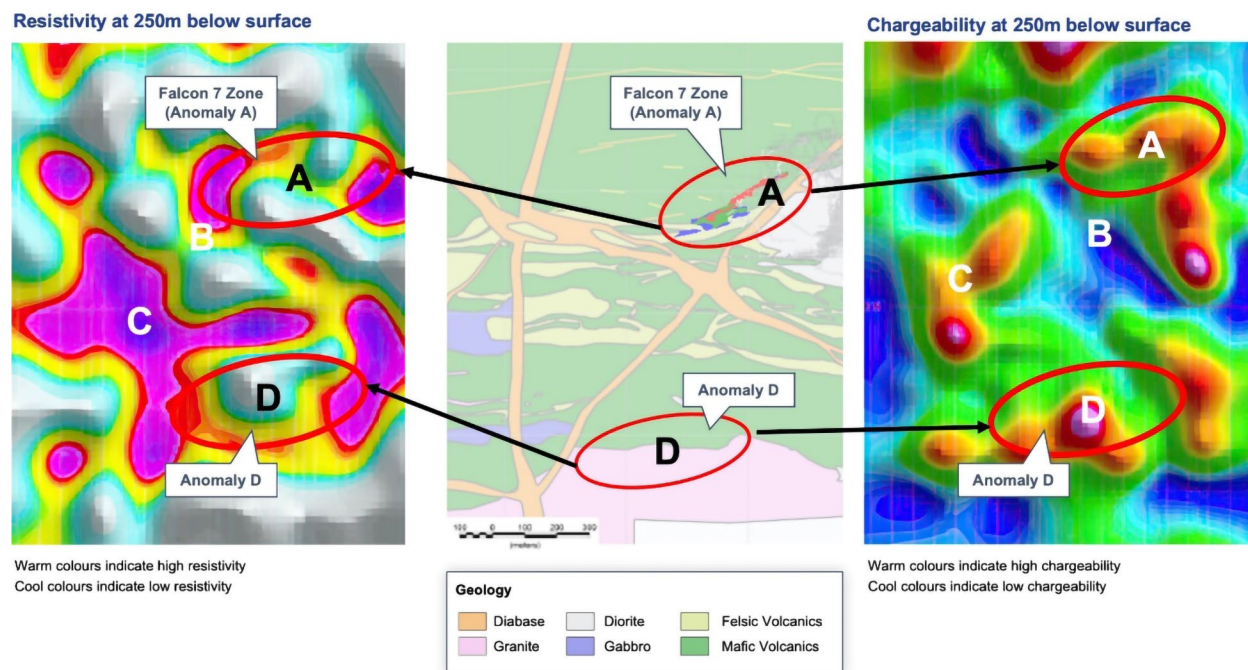


Figure 11. Plan view of IP survey results in the area to the south of the Eagle River Mine infrastructure. Location of survey area shown in Figure 7 (from Wesdome Gold Mines Ltd., news release, January 21, 2025).

Historical Mineral Production in the Sault Ste. Marie District

Historical mineral production of iron, gold, copper, lead, silver, zinc and uranium in the Sault Ste. Marie District is presented in Tables 6, 7, 8 and 9.

Table 6. Historical iron production in the Wawa area of the Sault Ste. Marie Mining District.

Mine - Owner	Township	Years of Production	Production (tons)
Old Stobie Mine – Mr. James Stobie Ltd.	Aberdeen Additional	1874–1878	No data
Breitung Mine – Breitung Iron Co.	Deroche	1900–1905	2000–3000
Williams Iron Mines Co. Ltd. – Williams Iron Mines Co. Ltd.	Hodgins	1902–1905	500
Rand Consolidated Mines Ltd. – Algoma Steel Corp. Ltd.	Aguonie	1918–1919	3000
Morrison No.4 – Algoma Steel Corp. Ltd.	Aguonie	1958–1959	67 000
Goudreau “C” – Algoma Steel Corp. Ltd.	Aguonie	1962–1963	375 000
Bear Claim – Algoma Steel Corp. Ltd.	Aguonie	1959–1961	350 000
Goudreau “A” – Algoma Steel Corp. Ltd.	Aguonie	1960–1961	250 000
Ruth and Lucy Mine – Algoma Steel Corp. Ltd.	Esquega	1967–1970	1 219 989
Josephine Mine – Michipicoten Iron Mines Ltd.	Corbiere	1945–1946	61 637
Old Helen – Algoma Steel Corp. Ltd.	Chabanel	1900–1918	52 000 (pyrite) + 2 700 000
Helen Mines, Alexander – Algoma Steel Corp. Ltd.	Chabanel	1939–1969	20 076 963
Victoria Open Pit – Algoma Steel Corp. Ltd.	Chabanel	1945–1960	10 202 089
George W. MacLeod Mine – Algoma Steel Corp. Ltd.	Chabanel	1960–1998	59 662 710
Sir James Mine (Eleanor Range) – Algoma Steel Corp. Ltd.	Chabanel	1958–1967	72 151 285
Magpie Mine – Algoma Steel Mine Corp. Ltd.	LeClaire	1913–1921	1 212 866

Table 7. Historical gold production in the Wawa area of the Sault Ste. Marie District to the end of 2024.

Mine	Township or Area	Years of Production	Tons Milled	Production (oz. gold)	Grade (oz/ton)
Alden–Goudreau	Cowie	1937, 1940, 1943, 1945	13 479	3220	0.24
Centennial	Naveau	1939–1940	8612	610	0.07
Cline	Jacobson	1938–1940, 1947–1948	331 842	63 328	0.19
Darwin/Grace	McMurray	1902–1903, 1907–1908, 1910, 1923, 1925, 1930, 1935, 1937, 1940, 1943–1944	45 528	15 191	0.33
Deep Lake	McMurray	1936–1938, 1943	2790	1633	0.59
Eagle River	Point Isacor	1995–2024	5 335 049	1 745 575	0.32
Edwards	Jacobson	1938	1537	485	0.32
		1997–2002	389 550	139 692	0.36
Holdsworth prospect	Corbiere	1933	60	10	0.17
Island Gold	Finan	2007–2024	5 446 249	1 660 186	0.30
Kremzar	Finan	1988–1990	392 858	37 678	0.10
Magino/Algoma Summit	Finan	1930–1940, 1988–1992, 2023–2024	>3 440 230	182 329	0.07
Magnacon	Mishibishu Lake	1989–1990	165 000	15 356	0.09
Minto (includes Jubilee and Cooper)	McMurray	1929–1942	184 600	37 678	0.20
Mishi	Mishibishu Lake	2002–2007, 2012–2022	935 096	67 006	0.07
Murphy/Algold/Amherst	Abotossaway	1926–1932, 1936–1938, 1940	23 211	2450	0.11
Norwalk/Manxman	Naveau	1904, 1910	820	60	0.07
Parkhill	McMurray	1902, 1929, 1930–1938, 1940–1944	125 778	54 301	0.43
Ranson	Rabazo	1939	774	156	0.20
Renabie	Leeson	1947–1970, 1981–1991	5 583 895	1 100 000	0.20
Smith/Van Sickel	McMurray	1935–1936	9228	536	0.06
Stanley	McMurray	1936	1963	84	0.04
Surluga	McMurray	1968–1969, 1988–1989	87 460	8898	0.10
Total:			>22 525 609	5 136 462	0.20*

*Grade is shown as average. (Resident Geologist Program Files, Sault Ste. Marie District, Sault Ste. Marie)

Table 8. Historical copper, lead, silver and zinc production in the Sault Ste. Marie District.

Mine	Township	Years of Production	Ore Milled (tons)	Grade
Copper Corp Mine – C Zone	Ryan	1965–1972	1 021 358	1.16% Cu, 0.22 oz/t Ag, 0.0002 oz/t Au
Tribag Mine (Breton Breccia)	Nicolet	1972	190 949	1.22% Cu
Jardun Mine	Jarvis	1954–1957	145 029	3.43% Pb, 2.44% Zn, 0.02% Cu, 1.5 oz/t Ag, 0.0007 oz/t Au
Bruce Mines	Plummer Additional	1854–1876, 1905– 1908	300 000	4.5%
Pater Mine	Spragge	1960–1968	2 000 621	1.76% Cu

(Resident Geologist Program Files, Sault Ste. Marie District, Sault Ste. Marie)

Table 9. Historical uranium production in the Elliot Lake area of the Sault Ste. Marie District.

Mine	Years	Tons	U ₃ O ₈ Production (lbs)
Algoma	1959	1 477 160	2 495 709
Can-Met	1958–1959	1 477 160	2 495 709
Denison	1957–1964	69 484 027	146 618 806
Lacnor		0	0
Milliken	1958–1959	1 796 789	3 169 600
Nordic	1957–1959	3 131 826	7 162 303
Panel	1979–1986 + 1988	7 844 980	14 533 440
Pronto	1957–1960	1 633 788	7 007 999
Quirke	1958–1960	1 962 652	4 437 377
New Quirke	1978–1986	23 294 020	45 490 560
Spanish American		0	0
Stanleigh	1958–1959 + 1988–1996	16 763 378	27 746 205
Stanrock	1958–1967	6 897 765	11 798 778
Rio Algom	1959–1996	88 547 989	188 099 114
Total		224 311 534	461 055 600

(Resident Geologist Program Files, Sault Ste. Marie District, Sault Ste. Marie)

EXPLORATION ACTIVITY

Introduction

In 2024, the Sault Ste. Marie District hosted a total of 6 exploration programs. Most activities in the District focussed on exploration of orogenic gold, intrusion-related gold, volcanogenic massive sulphide (VMS) systems, and magmatic-hydrothermal breccia-hosted porphyry copper-molybdenum systems that mainly occur in the Michipicoten, Mishibishu and Batchawana greenstone belts. A summary of exploration activities in the District is reported in Table 10 and Figure 12 and is described in the next section.

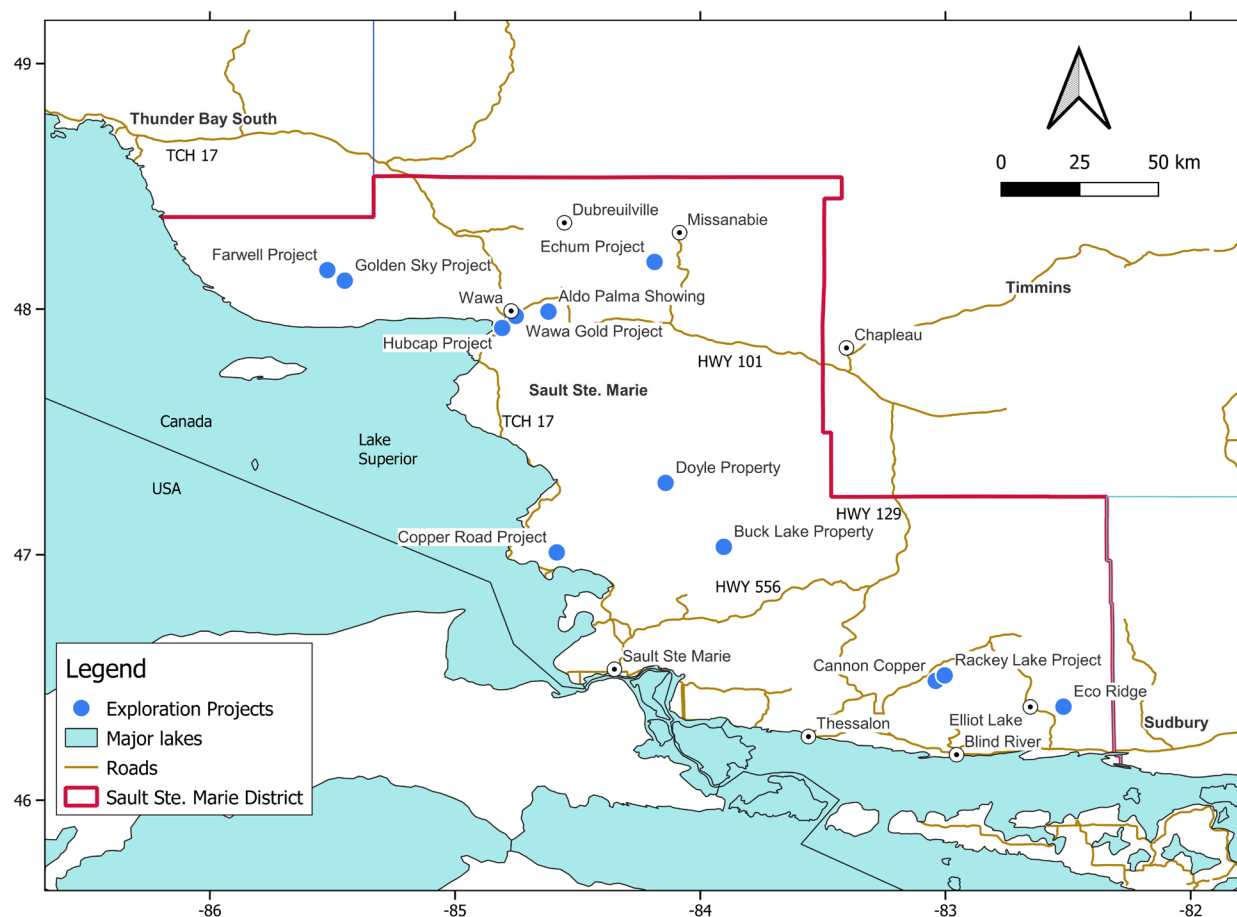


Figure 12. Map showing active exploration projects in 2024 within Sault Ste. Marie District (properties listed in Table 10). Latitude and longitude values are shown on the vertical and horizontal borders of the figure, respectively.

Table 10. Exploration activity in the Sault Ste. Marie District in 2024. Location of properties shown on Figure 12.

Abbreviations		
AEM	Airborne electromagnetic survey	GL Geological survey
ASD	Assay data	IP Induced polarization
CC	Channel cutting	SS..... Soil sampling survey
DD	Diamond drilling	NR News release
DC	Data compilation	Pr Prospecting

Company Project / Property Name	Township or Area (Commodity)	Exploration Activity
Angus Gold/ IAMGOLD <i>Golden Sky project</i>	Mishibishu Lake (<i>gold</i>)	GL, DD, CC, NR
Advanced Gold Exploration <i>Buck Lake property</i>	Lunkie (<i>copper, gold, silver</i>)	GL, Pr, DD, ASD
Advanced Gold Exploration <i>Doyle Lake property</i>	Runnals (<i>copper, gold</i>)	GL, Pr, DC, ASD
ALX Resources Corp. <i>Cannon Copper project</i>	Kamichisitit (<i>copper, gold</i>)	GL, Pr, DC,
Axies Canada Inc. <i>Rackey Lake property</i>	Kamichisitit (<i>copper, gold</i>)	Pr, GL, DC, ASD
Bold Ventures Inc. <i>Farwell project</i>	Pukaskwa River Area (<i>gold, battery metals</i>)	DC, NR
BTU Metals <i>Wawa Gold Properties Echum project</i>	Bruyere, Dolson, Echum, Lendrum (<i>gold</i>)	GL, ASD, IP, AEM, NR
BTU Metals <i>Wawa Gold properties Hubcap and Centennial projects</i>	McMurray, Lendrum, Rabazo, Naveau (<i>gold</i>)	GL, ASD, IP, AEM, NR
Radio Fuels Corp. <i>Eco Ridge project</i>	Gunterman, Joubin (<i>rare earth elements, uranium</i>)	GL, Pr, DC
Red Pine Exploration Inc. <i>Wawa Gold project</i>	McMurray (<i>gold</i>)	DD, GL, ASD, NR
Sierra Development Services <i>Aldo Palma showing</i>	Lastheels (<i>molybdenum</i>)	DC, GL, Pr
Sterling Metals Corp. <i>Copper Road project</i>	Ryan, Palmer, Kincaid, Nicolet (<i>gold, copper, silver, molybdenum, tungsten, rhenium</i>)	GL, ASD, SS, NR, DC

There were 3 active Exploration Plans (Table 11) and 39 Exploration Permits (Table 12) received in the Sault Ste. Marie District in 2024.

Table 11. Exploration plans in the Sault Ste. Marie District in 2024.

Plan #	Claim Holder/Proponent	Project Name	Township/Area
PL-23-000059	Angus Gold Inc.	Golden Sky	Mishibishu Lake Area, St. Germain
PL-23-000101	Red Pine Exploration Inc.	Wawa Gold West 2023	Lendrum, McMurray
PL-23-000102	Red Pine Exploration Inc.	Wawa Gold East 2023	Lastheels, McMurray, Naveau, Rabazo

Table 12. Exploration permits in the Sault Ste. Marie District in 2024.

Plan #	Claim Holder/Proponent	Project Name	Township/Area
PR-24-000052	1001061522 Ontario Inc.	Highland South	Abotossaway
PR-22-000094	Advanced Gold Exploration Inc.	Buck Lake	Lunkie
PR-22-000256	Advanced Gold Exploration Inc.	Doyle	Runnalls
PR-23-000126	Alamos Gold Inc.	Island Gold Regional Exploration	Jacobson
PR-23-000128	Alamos Gold Inc.	Island Gold Regional Exploration	Jacobson
PR-23-000129	Alamos Gold Inc.	Island Gold Regional Exploration	Bird, Jacobson
PR-23-000130	Alamos Gold Inc.	Island Gold Regional Exploration	Finan, Jacobson
PR-23-000131	Alamos Gold Inc.	Island Gold Regional Exploration	Dunphy, Finan
PR-23-000132	Alamos Gold Inc.	Island Gold Regional Exploration	Jacobson
PR-22-000299	Angus Gold Inc.	Golden Sky project	Mishibishu Lake Area, Point Isacor Area
PR-23-000265	Angus Gold Inc.	Golden Sky project	Mishibishu Lake Area, St. Germain
PR-24-000061	Angus Gold Inc.	Golden Sky project	Mishibishu Lake Area
PR-23-000198	Bear Creek Gold Ltd.	Pecors Gaiashk Drilling	Gaiashk, Joubin
PR-24-000110	Btu Metals Corp.	Echum project	Bruyere, Dolson, Echum
PR-24-000149	Btu Metals Corp.	Hubcap Main	Mcmurray, Naveau, Rabazo
PR-24-000150	Btu Metals Corp.	Centennial project	Naveau
PR-22-000034	Darien Aggregates Inc.	Nipissing Diabase	Long
PR-22-000199	First Minerals Mining Limited	Missanabie project	Meath, West
PR-23-000046	Jean Gaudreau	Abigo property	Abigo
PR-22-000263	Manitou Gold Inc.	Goudreau project	Acton, Amik, Brackin, Bruyere, Challenger, Glasgow, Leeson, Meath, Rennie, Riggs, West
PR-22-000033	Power One Resources Corp.	Serpent River - Pecors Anomaly	Gaiashk, Joubin
PR-22-000099	Red Pine Exploration Inc.	Wawa Gold project East	Mcmurray, Naveau
PR-23-000112	Red Pine Exploration Inc.	Wawa Gold project - West	Mcmurray
PR-23-000240	Rich Copper Exploration Corp.	Rapid River	Rioux
PR-21-000319	Sterling Metals Corp.	Copper Road project	Nicolet
PR-21-000322	Sterling Metals Corp.	Copper Road project	Nicolet, Norberg
PR-23-000004	Sterling Metals Corp.	Copper Creek	Ryan
PR-23-000005	Sterling Metals Corp.	Orion	Ryan
PR-23-000006	Sterling Metals Corp.	Gimlet Lake	Palmer, Ryan
PR-23-000007	Sterling Metals Corp.	Jorgan-Richards	Palmer, Ryan
PR-23-000008	Sterling Metals Corp.	Brant-Spider	Nicolet, Palmer
PR-23-000009	Sterling Metals Corp.	Mt. Breccia	Nicolet, Palmer
PR-23-000010	Sterling Metals Corp.	Tribag	Nicolet, Norberg
PR-22-000258	Wesdome Gold Mines Ltd.	Hilltop	Point Isacor Area
PR-22-000259	Wesdome Gold Mines Ltd.	Fork Vein	Point Isacor Area
PR-22-000260	Wesdome Gold Mines Ltd.	Falcon Creek	Point Isacor Area

A total of 45 assessment files, with a total value of CAD \$45 546 582, were catalogued by the District Geologist's office in 2024 (Table 13) and 991 donated files, which are currently not available on the Ontario Assessment File Database on OGSEarth (www.ontario.ca/ogsearth) or on GeologyOntario (www.hub.geologyontario.mines.gov.on.ca/), were sent to an external contractor for digitization (Table 14). All reports in 2024 were for work conducted during 2024 or earlier.

Table 13. Assessment files received in the Sault Ste. Marie District in 2024.

Abbreviations							
AMAG	.....	Airborne magnetometer survey	MCOMP	.....	Miscellaneous compilation and interpretation		
ASSAY	.....	Assaying and analyses	MMI	.....	Mobile metal ion™ soil sampling survey		
CHNL	.....	Channel sampling	OBM	.....	Ontario basic mapping - digitized base maps		
DHRLG	.....	Drill core relogging	OTHER	.....	Other		
GCBIO	.....	Geobotanical and biogeochemical survey	PDRILL	.....	Diamond drilling		
GCHEM	.....	Geochemical	PHOTO	.....	Air photo and remote imagery interpretations		
GEOL	.....	Geological survey / mapping	PROSP	.....	Prospecting by licence holder		
IP	.....	Induced polarization	RCDH	.....	Reverse circulation drilling		
LC	.....	Linecutting	ROCK	.....	Rock sampling		
MAG	.....	Magnetic / magnetometer survey	SOIL	.....	Soil/till sampling		
MAGTEL	.....	Magnetotelluric survey	VLF	.....	Electromagnetic very low frequency survey		

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000022340	Mishibishu Lake Area	Angus Gold Inc.	Golden Sky project	2022–2024	ASSAY, PROSP, ROCK	\$223 801	118233, 6976
20000022469	Gapp	Steve Anderson	Gapp project	2024	PROSP, ROCK	\$4992	118899, 7017
20000022393	Abotossaway, Abotossaway, Dunphy, Huotari, Jacobson, Leguerrier, Riggs	Alamos Gold Inc.	Goudreau property, Island Gold Mine property, Trillium property	2021–2024	ASSAY, CHNL, DHRLG, MCOMP, PDRILL, PROSP, RCDH, ROCK, SOIL	\$5 687 966	120219, 120220, 120221, 120222, 120223, 7071, 7072, 7073, 7074, 7075
20000021707	Gould	George Lucuik	Gould Copper property	2023	ASSAY, PROSP, ROCK	\$2337	111256, 6507
20000021954	Slater	Greg Myshrall	Shuttle Claim	2021–2023	ASSAY, PROSP	\$11 708	113272, 6630
20000021961	Jarvis	13369871 Canada Inc.	Jardun project Area, Jarvis Deep Claims	2023	ASSAY, GCHEM, PHOTO, PROSP	\$20 214	115802, 6821
20000021973	Abotossaway	Prodigy Gold Inc.	Highland South property, Oban Block	2020	ASSAY, PROSP	\$12 327	116681, 6875
20000022424	Dolson, Bruyere, Dolson	BTU Metals Corp	Echum project	2021–2024	ASSAY, PROSP, ROCK	\$33 091	123399, 7235
20000022054	Meath	Manitou Gold Inc.	Goudreau project	2022	ASSAY, PDRILL	\$389 786	100331, 5940
20000022057	Montgomery, Nouvel	Colossus Resources Corp.	Master Copper property	2023	ASSAY, PDRILL	\$126 509	110399, 110401, 6457, 6458
20000022063	Dumas	Frederick Archibald	RA project Number TLAR2407, Twin Lakes West Claims	2022–2023	MMI, PHOTO	\$25 985	117666, 6951
20000022064	Huotari, Pearkes	Frederick Archibald	Camp Lake Claims, Claim Block #11, RA project number CLAR2408	2022	MMI, PHOTO	\$19 228	117670, 6952
20000022067	Leguerrier	Frederick Archibald	Wolfe Claims	2023	MMI, PHOTO	\$16 394	117795, 6964
20000022074	Meath	Manitou Gold Inc.	Goudreau project	2022	ASSAY, PDRILL	\$1 516 758	5888, 99670

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000021633	McMurray	Red Pine Exploration Inc.	Wawa Gold project	2021	ASSAY, CHNL, MAGTEL, OBM, PDRILL, PROSP, ROCK	\$2 811 262	110422, 110500, 6459, 6462
20000021586	Abigo	J M Gaudreau	Abigo property	2023	MAG	\$9027	109528, 6394
20000021587	Vankoughnet	Canadian Arrow Mines Ltd.	Sill Lake Lead-Silver property	2023	AMAG	\$39 213	109536, 6395
20000021867	Mishibishu Lake Area, Abbie Lake Area, David Lakes Area, Keating Additional, Point Isacor Area, Pukaskwa River Area	Angus Gold Inc.	Golden Sky project	2022–2024	GCBIO	\$133 011	114146, 6714
20000021799	Dolson, Bruyere	Kingsview Minerals Ltd.	Echum project	2023	IP, LC, PDRILL	\$199 386	112513, 6602
20000021806	Quill	Edward Shynkorenko		2023	ASSAY, PROSP	\$2 665	113038, 6619
20000021722	Abotossaway	Prodigy Gold Inc.	Rand 2 property	2021	IP	\$112 434	103906, 6174
20000022178	Kamichisitit	Axies Canada Inc.	Rackey Lake project	2024	ASSAY, PROSP, ROCK	\$20 745	119680, 7035
20000021774	Palmer	Rich Copper Exploration Corp.	Peter Breccia property	2023	MAG, VLF	\$23 704	112072, 6586
20000022254	Point Isacor Area	Wesdome Gold Mines Ltd.	Eagle River property	2022	ASSAY, PDRILL	\$3 327 700	114595, 114597, 6733, 6734
20000022265	Chabanel	12551110 Canada Inc.	Ghost Lake property	2023	ASSAY, MMI, SOIL	\$7770	120560, 7103
20000022019	Lunkie			2023	PROSP	\$1100	115521, 6799
20000022022	Riggs	Tim Lavoie	Lochalsh Claim	2023	ASSAY, PROSP	\$1326	116511, 6859
20000022028	Abotossaway, Aguonie	Prodigy Gold Inc.	Greasy Bear, Rand 2 property	2022 - 2023	ASSAY, GEOL, PDRILL, PROSP	\$276 905	117334, 6921
20000022032	Dunphy	Frederick Archibald	Block #3, Nadeau Lake Claims	2022	ASSAY, GCHEM, PHOTO	\$16 361	117533, 6935
20000022035	Tilston	Frederick Archibald	Tilston Creek Claims	2022–2023	ASSAY, GCHEM	\$20 639	117607, 6943
20000022500	Naveau	Kingsview Minerals Ltd.	Centennial property	2022–2023	LC, MAG	\$18 970	126131, 7339
20000022502	Slater	Gregory Myshrall		2022–2024	ASSAY, PROSP, ROCK	\$8 198	126260, 7346
20000021666	Aberdeen Additional, Chesley Additional	Skead Holdings Ltd.		2022–2023	ASSAY, PROSP, ROCK	\$2 942	106292, 6249
20000021669	Aberdeen	Evgeniy Seminenko	Bass Lake (Kirk Gold) prospect	2023	ASSAY, PROSP, ROCK	\$3 365	110340, 6450
20000021832	Silcox Lake Area, BMA 515 931, Nechigona Lake Area, Storey Lake Area	Leventis Metals Inc.	Red Lake property	2022	ASSAY, GEOL, PROSP, SOIL	\$336 494	112554, 6604
20000022095	Finan, Jacobson	Alamos Gold, Island Gold	Finan	2019–2023	ASSAY, PDRILL	\$25 090 608	110982, 110983, 6489, 6490
20000022097	Norberg	Rich Copper Exploration Corp.	Tribag East property	2023	ASSAY, PROSP, VLF	\$49 025	113193, 6626
20000022098	Palmer	Rich Copper Exploration Corp.	Copper Cliff Area, Tribag East property	2023	ASSAY, PROSP	\$15 877	113197, 6627

SAULT STE. MARIE DISTRICT—2024

File Identifier	Township/Area	Company Name	Property Name	Year	Work Type	Work Approved	Other File Identifier(s)
20000022117	Finan, Jacobson		Finan Township	2017–2019	ASSAY, PDRILL	\$4 743 862	117271, 6916
20000021659	Poulin, Sagard	EMX Royalty Corp.	Elliot Lake North Uranium property	2023	GEOL, OTHER	\$42 908	110345, 6452
20000021663	Albanel, Nicholas	Axies Canada Inc.	Endikai project	2023	ASSAY, PROSP, ROCK, SOIL	\$56 657	110655, 6470
20000021759	Poulin, Sagard	EMX Royalty Corp.	Elliot Lake North Uranium property	2022	ASSAY, PROSP	\$18 914	109090, 6364
20000021926	Jarvis	13369871 Canada Inc.	Jardun project, Weashkog Lake East	2023	GCHEM, PHOTO	\$7643	115127, 6776
20000021928	Jarvis, Duncan	13369871 Canada Inc.	Grassy Lake, Jardun project	2023	GCHEM	\$7851	115231, 6786
20000021936	Copenace, Echum	Fulcrum Metals	Dog Lake	2023	GCHEM	\$48 924	115689, 6808
Total						\$45 546 582	

¹Other file identifiers may be work report numbers or MLAS transaction identification (ID) numbers.

Table 14. Number of donated and assessment files from townships in the Sault Ste. Marie District sent for scanning and digitization in 2024.

Township	Number of files	Township	Number of files	Township	Number of files	Township	Number of files
Abbie Lake	4	Dolson	3	Laird	2	Raaflaub	2
Aberdeen	1	Dumas	2	Lalibert	5	Rabazo	12
Aberdeen Add'l	7	Duncan	1	Lang	2	Raimbault	5
Abotossaway	19	Dunphy	2	Larson	1	Rankin Mnrl Loc	2
Acton	1	Echum	1	Lastheels	5	Recollet	1
Aguonie	10	Esquega	31	Laverendrye	3	Rennie	12
Alanen	1	Esten	3	Leclair	13	Riggs	6
Alarie	1	Finan	23	Leeson	38	Rix	5
Albanel	4	Franchere	5	Lendrum	18	Rollins	1
Allouez	1	Gaiashk	7	Lewis	5	Rose	2
Anderson	1	Galbraith	1	Ley	2	Running	3
Andre	1	Gapp	4	Long	9	Ryan	17
Archibald	1	Gaudette	3	Lunkie	2	Sagard	4
Asselin	1	Gaudry	1	MacDonald	3	Sampson	1
Atkinson	1	Gaunt	1	Mame	3	Saunders	1
Awenge	2	Giles	2	Marsh	2	Schembri	4
Aweres	5	Gladstone	3	McDougall Lake Area	2	St. Joseph	4
Bailloquet	3	Glasgow	7	McDowell	1	Shedden	3
Beange	6	Goodwillie	3	McIveen	1	Shields	2
Bird	3	Gould	3	McMurray	40	Simons	1
Bouck	11	Grasett	1	McParland	1	Slater	1
Brackin	10	Greenwood	2	Meath	4	Smilsky	1
Bridgland	2	Groseilliers	2	Menzies	2	Spragge	2
Brimacombe	1	Gunterman	15	Michipicoten Island	16	St. Germain	4
Bruyere	3	Havilland	1	Mishibishu Lake	10	Stone	1
Buckles	6	Hodgins	3	Moen	3	Stover	7
Bullock	5	Home	1	Montgomery	1	Striker	2
Camp Lake	8	Homer	3	Nahwegezhic	7	Tarbutt	3
Casson	2	Hughes	3	Naveau	10	Tarentorus	3

Township	Number of files	Township	Number of files	Township	Number of files	Township	Number of files
Chabanel	48	Indian Reserve #7	6	Nebonaionquet	6	Thompson	1
Chapais	1	Indian Reserve #14	4	Neill	4	Tilley	2
Chenard	1	Jacobson	21	Nicholas	6	Tilston	1
Chesley	1	Jarvis	6	Nicolet	7	Tronsen	5
Cobden	1	Jessiman	3	Noganosh	1	Tupper	1
Copenace	2	Jocelyn	1	Olsen	7	Varley	3
Corbiere	25	Jogues	3	Otter	1	Vankoughnet	13
Cowie	13	Johnson	7	Palmer	14	Vasiloff	1
Dablon	2	Joubin	11	Parkinson	2	Vibert	3
Dagle	2	Kamichisitit	5	Pawis	1	Villeneuve	2
Dahl	1	Keating	6	Pearkes	1	Way-White	3
Dambrossio	1	Kehoe	6	Peever	11	Waswa	3
Daumont	2	Killims	7	Plummer Additional	23	Wawia	2
David Lakes	13	Kincaid	17	Poulin	3	Wells	1
Davieaux	8	Knically	2	Prince	1	West	2
Debassige	5	Korah	3	Proctor	3	Wishart	3
Deroche	15	Labelle	3	Pukaskwa	1	Wlasy	11
Desbiens	3	Labonte	4	Quill	2		

Abbreviation: Add'l = Additional.

Exploration Projects

MICHIPICOTEN GREENSTONE BELT

Red Pine Exploration Inc. – Wawa Gold Project

The Wawa Gold project in McMurray Township, approximately 2 km east of the town of Wawa (see Figure 12), consists of 122 patented or leased mining claims and 302 unpatented mining claims that cover an area of 7041 ha, and is accessible via a gravel road that connects to Highway 101 (Thomas and Haggarty 2024). The property has a recently revised Mineral Resource Estimate (MRE) released in an NI 43-101 Technical Report dated September 30, 2024 (resource effective date of August 28, 2024) with a combined open pit and underground Indicated Mineral Resource of 14.7 million tonnes, at 1.79 g/t Au, containing 842 000 ounces of gold and an Inferred Mineral Resource of 16.2 million tonnes, at 1.62 g/t Au (Thomas and Haggarty 2024).

The geology of the property consists of polydeformed greenschist-facies felsic to intermediate metavolcanic rocks emplaced during 3 volcanic cycles at *circa* 2.9 Ga, 2.75 Ga and 2.7 Ga, and were intruded and hydrothermally altered by Late Archean to Proterozoic plutonic and volcanic suites of varied compositions (Sage 1994; Thomas and Haggarty 2024). Gold mineralization in the property consists of an early intrusion-related event and 3 distinct orogenic cycles (Figure 13; Ma, Lafrance and Montreuil 2025; Thomas and Haggarty 2024). The main intrusion-related gold mineralization is hosted in Jubilee Stock, at *circa* 2.75 Ga mafic to felsic calc-alkalic intrusion formed of porphyritic and/or phaneritic quartz diorite to tonalitic rocks, located within the Wawa–Hawk Lake–Manitowik Lake Fault System (Thomas and Haggarty 2024). The 3 orogenic cycles of mesothermal gold mineralization in the greenstone-hosted quartz–carbonate veins (Ma, Lafrance and Montreuil 2025) are D₁ (Grace deformation event), related to northwest-southeast shortening in Grace and Minto C shears; peak D₂ (Jubilee deformation event), related to top-to-north-northeast strike-slip to oblique faulting in the Jubilee and Hornblende shears; and D₃ (Minto deformation event), related to top-to-northeast extensional shear zones in Minto Mine and Parkhill #4 shears.

The early D_1 -related Grace deformation event was the principal gold–pyrite-bearing mineralization event in the Wawa gold corridor whereas the other gold-bearing assemblages, such as gold+ D_2 pyrite and gold+bismuth–tellurium phases+chalcopyrite, were mainly formed during secondary mobilization of the primary gold enrichment during subsequent events (Wehrle, Montreuil et al. 2023; Wehrle, Samson et al. 2023). The main orogenic D_2 -related Jubilee Shear zone hosts the Jubilee deposit (containing the Surluga deposit, as referred in previous technical reports), which is characterized by either pyrite-dominant quartz veins with accessory to absent pyrrhotite and arsenopyrite, minor to absent chalcopyrite, native gold coating iron sulphides (occasionally as inclusions, or in solid solution with pyrite), sphalerite and galena, or arsenopyrite-dominant relicts of quartz veins that are variably preserved (Wehrle 2020). Gold mineralization related to the extensional D_3 event in the Minto Mine area is associated with quartz–tourmaline veins with variable amounts of pyrite, accessory pyrrhotite, minor to trace chalcopyrite, native gold, and minor gold–bismuth alloys, native bismuth and bismuthinite (Wehrle 2020).

In 2024, Red Pine Exploration Inc. made significant progress with their Wawa Gold project, with a fully funded exploration program. The first phase included releasing assay data from 2023 to 2024 drilling, which was part of an approximately 70 000 m resource expansion program undertaken between 2021 and 2024 (Figure 14; Red Pine Exploration Inc., news releases, April 3 and 24, 2024). However, as of May 1, 2024, Red Pine announced, in a news release, that certain inconsistencies were discovered in their assay results from the Wawa Gold project, and as a result, all assay data publicly released, through news releases or in other documents (e.g., NI 43-101 Technical Reports), were withdrawn (Red Pine Exploration Inc., news release, May 1, 2024). Following a rigorous third-party audit, Red Pine released the results of the audit in the form of corrected data releases (Red Pine Exploration Inc., news releases, May 6, 10, and 15, 2024) and also, an independent data verification process was completed in July (Red Pine Exploration Inc., news release, July 24, 2024). The corrected data, coupled with additional assay results led to a revised 2024 MRE released in an NI 43-101 Technical Report dated September 30, 2024 (Red Pine Exploration Inc., news releases, June 24, 27 and August 28, 2024). Newly published assay results from a 2022 to 2024 drilling program, which had not been incorporated in the 2024 MRE, confirmed continuity of previously known high-grade (>2 g/t Au) gold mineralization within and below the Jubilee Shear zone, including gold mineralization at depth both down-dip and down-plunge, and in sheared vein networks in the hanging wall of the Jubilee Shear, including Minto B shear zone (Red Pine Exploration Inc., news releases, May 29, June 27, and July 18, 2024). To the south of the northwest-trending Parkhill

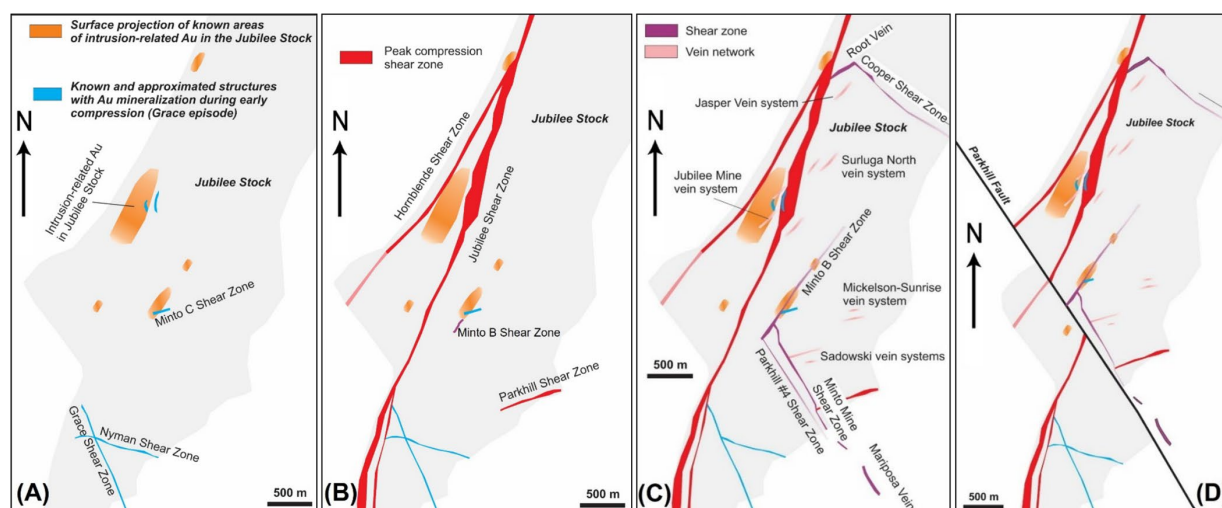


Figure 13. Schematic evolution of gold mineralization in relation to intrusive and orogenic events in Wawa Gold project. **A)** Formation of intrusion-related gold and early D_1 compression zones; **B)** peak D_2 compression; **C)** late D_3 extension; and **D)** post-Parkhill Fault geometry of mineralized structures (*modified from Thomas and Haggarty 2024*).

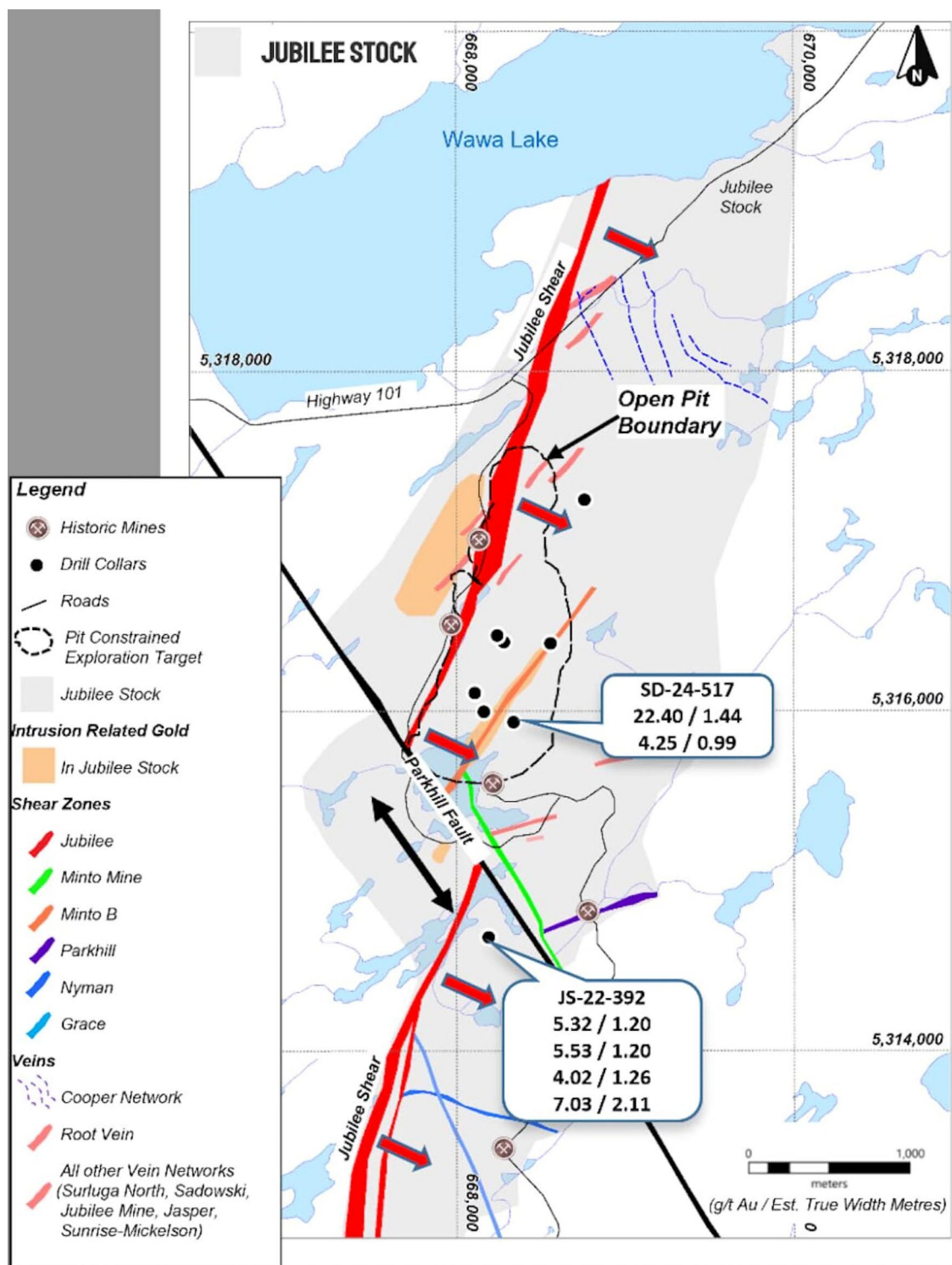


Figure 14. Plan map of 2024 drilling operations in the Wawa Gold project (from Red Pine Exploration Inc., news release, October 31, 2024). Universal Transverse Mercator (UTM) co-ordinates in North American Datum 1983 (NAD83), Zone 16.

Fault, which offsets the Jubilee Shear approximately 800 m southeast, drilling in the hanging wall of Jubilee Shear intersected a vein network assaying 1.19 g/t Au over 6.48 m, including 5.32 g/t Au over 1.29 m, where quartz–carbonate–chlorite–tourmaline-altered sheared tension veins with disseminated pyrite and visible gold with pyrite–pyrrhotite in the upper alteration zone and arsenopyrite in the lower alteration zone were reported (Red Pine Exploration Inc., news release, October 31, 2024).

The 2024 prospecting program uncovered new zones of gold mineralization in shear-hosted, northwest-north-northwest trending quartz veins in the Cooper area to the north of Jubilee Shear where bismuth-rich grab samples returned up to 16.80 g/t Au and additional samples returned up to 75.90 g/t Au (Red Pine Exploration Inc., news release, October 17). Prospecting in the War Eagle area, approximately 3 km south-southeast of the 2024 MRE, indicated 2 east-northeast-oriented structures: 1) the War Eagle South shear, where grab samples returned up to 17.10 g/t Au, and 2) the War Eagle North shear, where grab samples returned up to 12.90 g/t Au. Both structures are parallel to the previously reported Villeneuve shear, where channel samples returned 1.84 g/t Au over 4.70 m, including 4.64 g/t Au over 1.00 m (Red Pine Exploration Inc., news release, November 27, 2024). The latest discovery of high-grade gold, with grab samples returning up to 9.99 g/t Au in the Hornblende Shear zone, which extends 2.4 km along strike and is located 350 m west of the updated 2024 MRE, resulted in the acquisition of a patented mining and surface rights claim, covering 3.8 ha (Red Pine Exploration Inc., news release, December 17, 2024).

In November 2024, the company announced the commencement of a 2024–2025, fully funded, 25 000 m drilling program, which is primarily targeted to extend the known zones of gold mineralization reported in the 2024 MRE and focussed on the underground potential of Jubilee Shear, the newly prospected Jubilee North and Cooper areas, and the faulted extension of Jubilee Shear to the south of the northwest-trending Parkhill Fault (Figure 15; Red Pine Exploration Inc., news release, November 12, 2024).

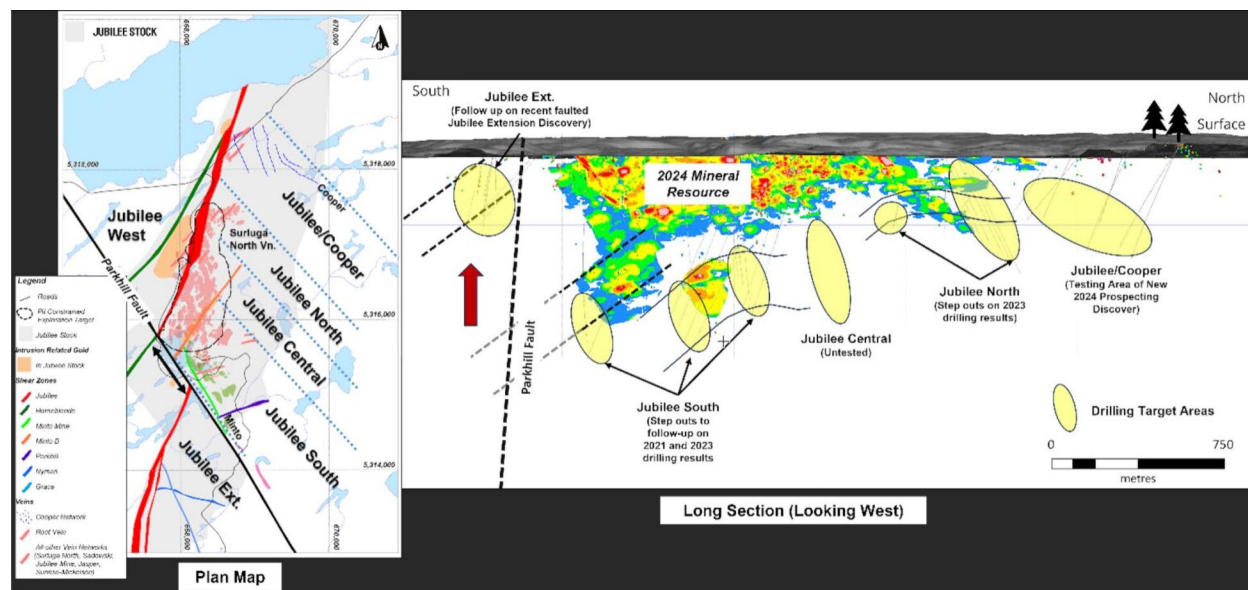


Figure 15. Location map of planned 2024–2025 drilling program in the Wawa Gold project (from Red Pine Exploration Inc., news release, November 12, 2024).

BTU Metals Corp. – Wawa Gold Properties

The Wawa gold properties (formerly owned by Kingsview Minerals) consist of the Echum and Hubcap (including Centennial Gold Mine) projects covering 750 mining claims over 16 048 ha in area and were 100% acquired by BTU Metals Corp. from the previous owner through a purchase and sale agreement (BTU Metals Corp., news releases, May 7 and June 13, 2024; Figure 16, *see also* Figure 12). The Echum Project is located 50 km northeast of Wawa within Dolson, Bruyere and Echum townships, accessible using Trans-Canada Highway 17 and Highways 101 and 651 (*see* Figure 12). The Hubcap Project was later divided into Hubcap and Centennial projects, located to the southwest and southeast of Red Pine's Wawa Gold project, respectively. (Figures 12 and 16; BTU Metals Corp., news release, July 31, 2024). All 3 project areas have historical non-NI-43-101-compliant high-grade gold and silver assays from grab samples and drilling intersects.

The general geology of the Wawa gold properties consists of mafic to intermediate and felsic metavolcanic and metasedimentary rocks and iron formations of the Archean Michipicoten greenstone belt, intruded by late-Archean granitic (*sensu lato*) plutons. The rocks of Michipicoten greenstone belt are polydeformed and metamorphosed to greenschist-facies and amphibolite-facies conditions (Sage 1994).

The planned exploration work for 2024–2025 included line cutting, prospecting, geological mapping, and IP geophysics followed by diamond drilling in spring of 2025 on the Echum project, for which the company received funding from Ontario Junior Exploration Program (BTU Metals Corp., news releases, July 31 and December 9, 2024). Planned activity on Hubcap and Centennial projects included line cutting, trenching, channel sampling and a geophysical IP survey (BTU Metals Corp., news release, July 31, 2024). In the fall of 2024, the company carried out surface sampling at Hubcap, where highly altered samples with quartz veining were collected for assay analyses (BTU Metals Corp., news release, December 9, 2024).

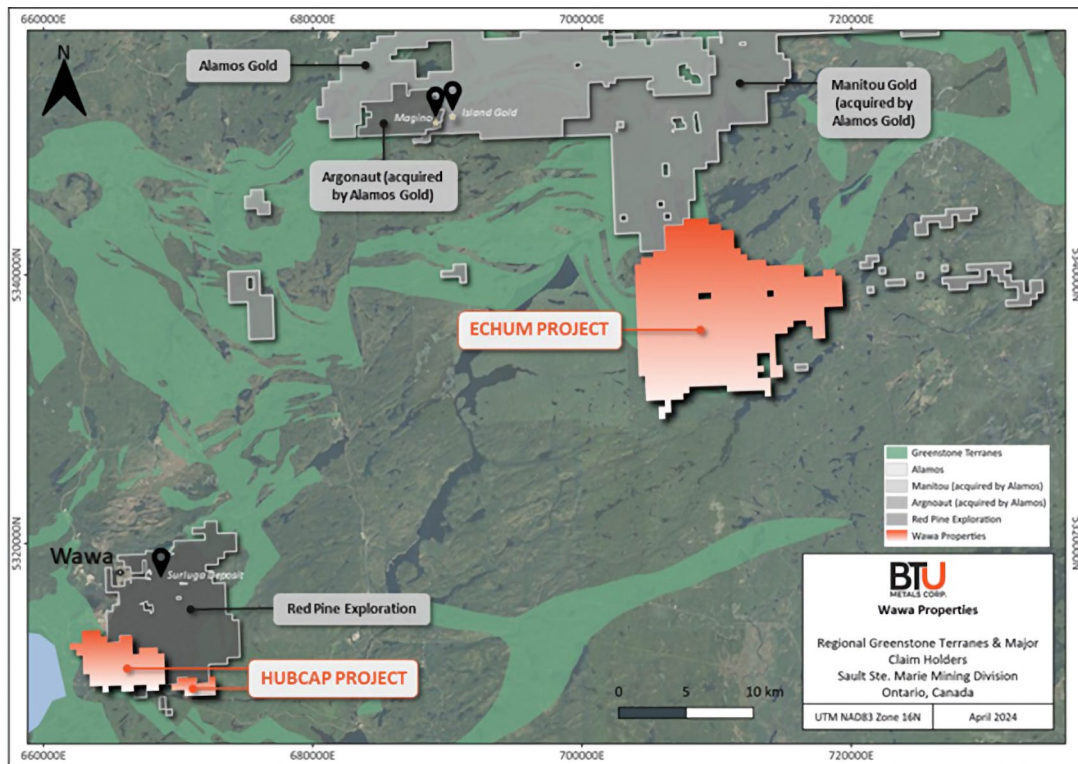


Figure 16. Map showing the Echum and Hubcap properties in relation to other active exploration and mining operations within the Michipicoten greenstone belt (*from* BTU Metals Corp., news releases, May 7 and June 13, 2024). UTM co-ordinates in NAD83, Zone 16.

MISHIBISHU GREENSTONE BELT

Angus Gold Inc. – Golden Sky Project

The Golden Sky project consists of over 1149 mining claims (Hamilton and Beh 2021, 2022) and covers an area of approximately 267 km² between Wesdome's Mishi and Eagle River mines. Golden Sky is located 50 km west of the town of Wawa, within the Mishibishu Lake and Point Isacor areas, and Groseilliers and St. Germain townships (*see* Figure 12). The property is accessible via Paint Lake Road, an all-weather gravel road that links the Trans-Canada Highway 17 to the Eagle River Mine (Hamilton and Beh 2021, 2022).

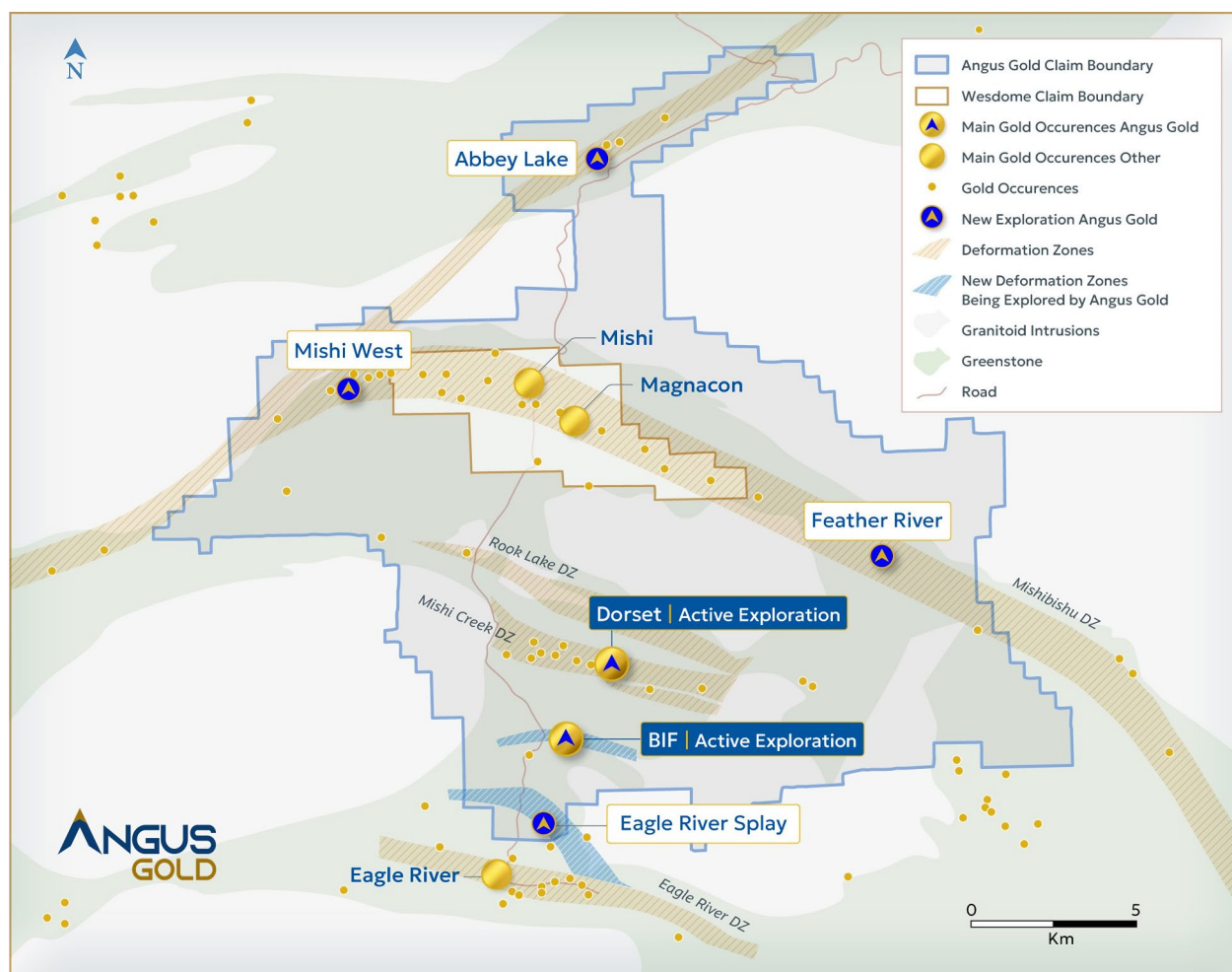


Figure 17. Plan map showing active exploration areas in Golden Sky project (*from* Angus Gold Inc., news release, October 31, 2024).

The property is located within the Mishibishu greenstone belt, comprising Archean metavolcanic rocks, which consist of mafic massive to pillowed flows and associated pyroclastic units, and metasedimentary rocks, all intruded by 3 granitoid bodies and diabase dikes (Bowen 1986; Kilbourne 2020; Hamilton and Beh 2021, 2022). The property hosts multiple active exploration drilling target areas, including the Dorset deformation zone, which hosts the historical gold resource in the Dorset Gold Zone (DGZ); the Banded Iron Formation zone (BIF), which has historical and recent high-grade gold assay results from surface and drill core sampling; and the Eagle River deformation zone, which includes the newly discovered Eagle River Splay. There are also 3 surface exploration and soil sampling areas at Feather River, Mishi West, and Abbey Lake areas (Figure 17; Angus Gold Inc., news release, October 31, 2024).

In late 2023 and early 2024, the company targeted moderately chargeable IP anomalies with strong resistive zones within the Eagle River Splay system, part of the Eagle River deformation zone, where a new gold discovery returned assays of 2.0 g/t Au over 5.4 m, including 4.5 g/t Au over 1.2 m (Angus Gold Inc., news releases, January 9 and May 28, 2024). Infill and resource expansion drilling programs in the Dorset area proved to be successful, with 2 different styles of mineralization reported: 1) disseminated sulphides intersections containing 2.6 g/t Au over 11.0 m and 2) sulphides with intense quartz veining yielding 7.0 g/t Au over 12.4 m, including 21.7 g/t Au over 3.3 m (Angus Gold Inc., news release, April 30 and May 7, 2024). Step-out holes in the western extension of the Dorset zone defined a high-grade gold zone of 2.3 g/t Au over 9.8 m and 2.2 g/t Au over 5.0 m (Angus Gold Inc., news release, November 6, 2024). At BIF zone, infill drilling intersected thick gold zones that returned multiple high-grade assays including 1.1 g/t Au over 47.4 m, 0.9 g/t Au over 42.2 m, and 1.0 g/t Au over 49.0 m. Step-out holes, targeted to test structural continuity and geometry of mineralization, revealed high-grade assays of 5.4 g/t Au over 3.0 m and 6.0 g/t Au over 1.8 m, which were confined within a broader 111.0 m zone of mineralization at 1.0 g/t Au and 8.6 g/t Au over 2.0 m, thereby defining the BIF gold zone for a strike-length of approximately 1050 m (Figure 18; Angus Gold Inc., news releases, July 30, May 7, October 16 and December 4, 2024). In 2024, Angus Gold completed a total of 16 700 m of diamond drilling (Angus Gold Inc., news release, December 4, 2024).

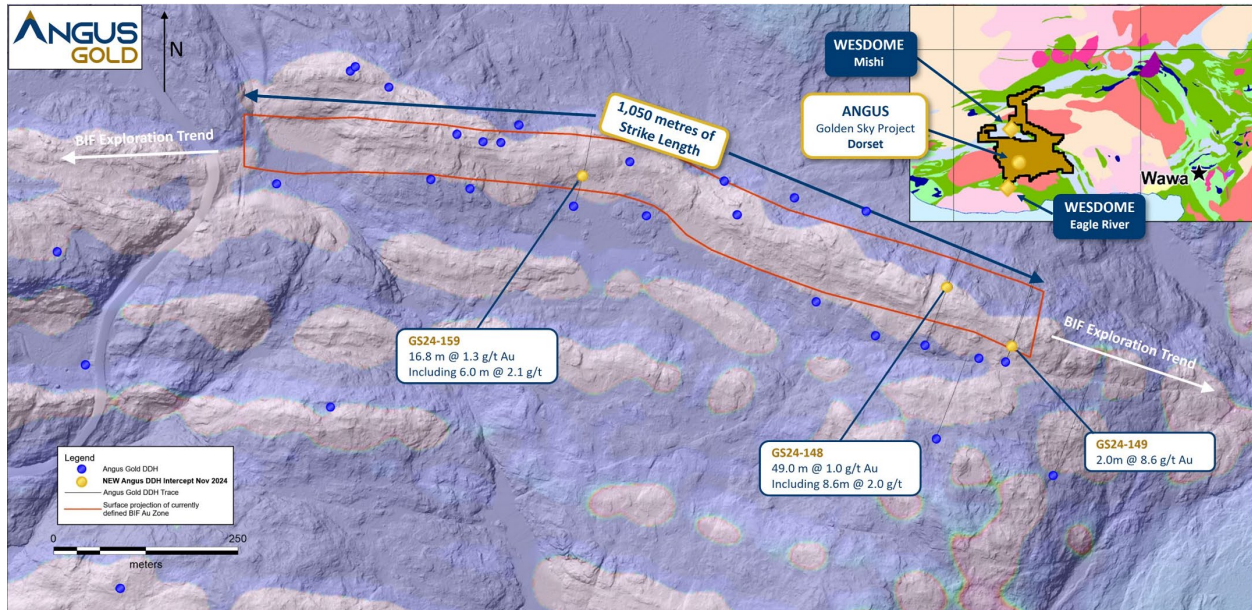


Figure 18. Aeromagnetic map showing 2024 drilling in BIF zone, Golden Sky project (from Angus Gold Inc., news release, December 4, 2024).

BATCHAWANA GREENSTONE BELT

Sterling Metals Corp. – Copper Road Project

The Copper Road project (formerly Coppercorp Glenrock project owned by Copper Road Resources) constitutes unpatented mining claims that cover an area of approximately 24 000 ha, located 85 km north of the city of Sault Ste. Marie, in Palmer, Ryan, Kincaid and Nicolet townships, and can be accessed via a network of logging and/or bush roads that connect to the Trans-Canada Highway 17 (see Figure 12). The property was acquired by Sterling Metals through a 100% share purchase agreement (Sterling Metals, news releases, February 14, 27, April 30 and May 10, 2024).

Geologically, the property straddles the boundary between Proterozoic Keweenawan Supergroup rocks and the Batchawana greenstone belt of the Archean Superior Province, separated by a north-northwest-trending unconformity. Keweenawan felsic intrusions and breccia bodies hosting base and precious metals mineralization intrude the metavolcanic-metasedimentary rocks throughout the Copper Road property and in the vicinity of the unconformity. The geology consists of greenschist to amphibolite facies, mafic to intermediate and minor felsic metavolcanic rocks, locally intercalated by Algoma-type banded iron formation (Boyd 2017).

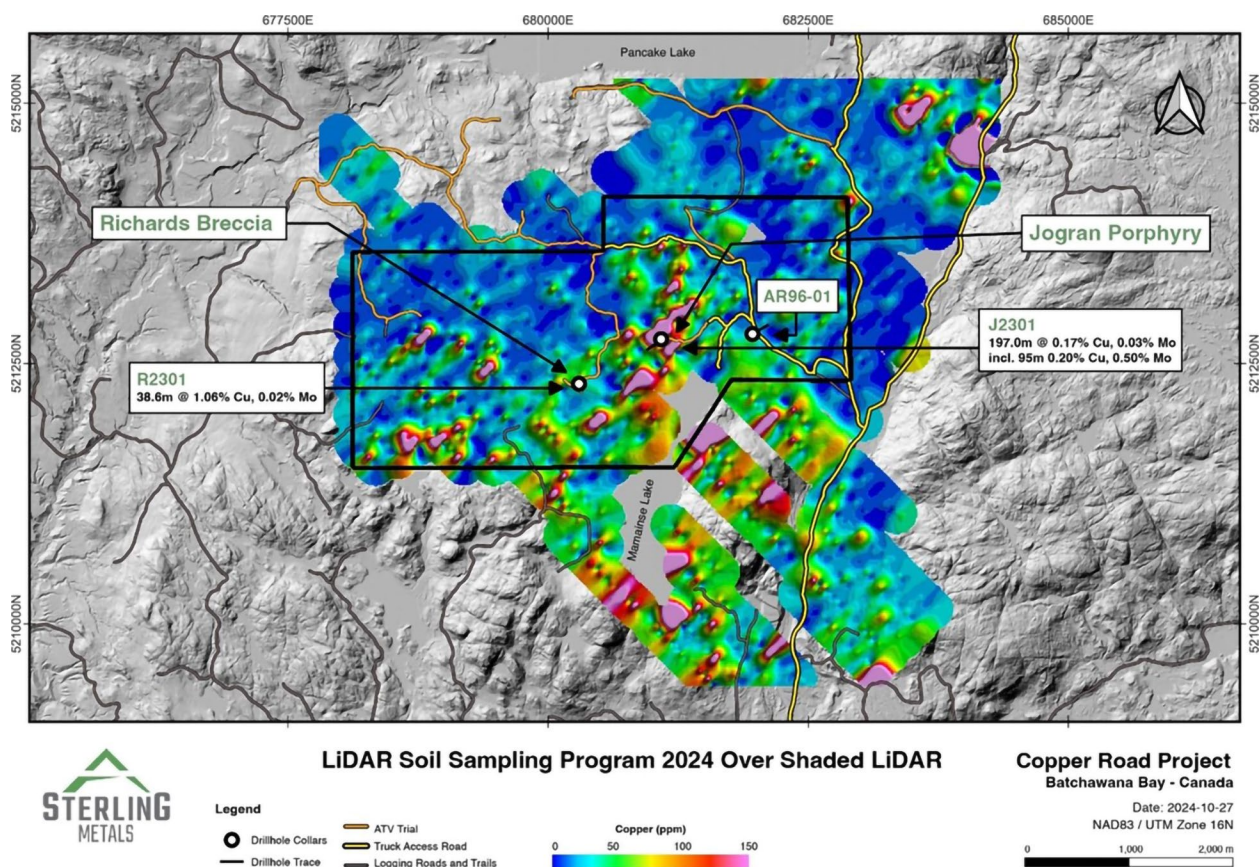


Figure 19. Copper anomaly map derived from soil sample analyses displayed over lidar map in central area of the project where an IP chargeability survey (area in black polygon) was planned (from Sterling Metals Corp., news release, October 29, 2024). UTM co-ordinates in NAD83, Zone 16.

Since acquisition in 2024, Sterling Metals initiated modelling of historical geophysical data, acquisition and conversion of new airborne magnetic, radiometric and lidar surveys, as well as a mapping, prospecting and ground soil sampling program (Sterling Metals Corp., news releases, June 26 and August 20, 2024). Grab samples returned an average of 1.96% Cu with values of up to 15.90% Cu and 4.84% Mo, whereas samples from hydrothermal magnetite–sulphide veins returned up to 15.4% Cu, 54 g/t Ag, and 1.34 g/t Au (Sterling Metals Corp., news release, October 29, 2024). A three-dimensional (3-D) IP chargeability survey covering 15 km² area, which was coincident with their soil and surface sampling and lidar mapping program, revealed anomalous samples with a high proportion of sulphides in fractures, veinlets, and in massive forms (Figure 19; Sterling Metals Corp., news releases, October 29 and November 19, 2024). A summer sampling and ground mapping program led to the discovery of new magnetite veins and propylitic alteration and to identification of a 3 km long porphyry footprint on surface. This suggests the possibility of a large porphyry copper mineralized system at moderate depth (Figure 20; Sterling Metals Corp., news release, October 29, 2024).

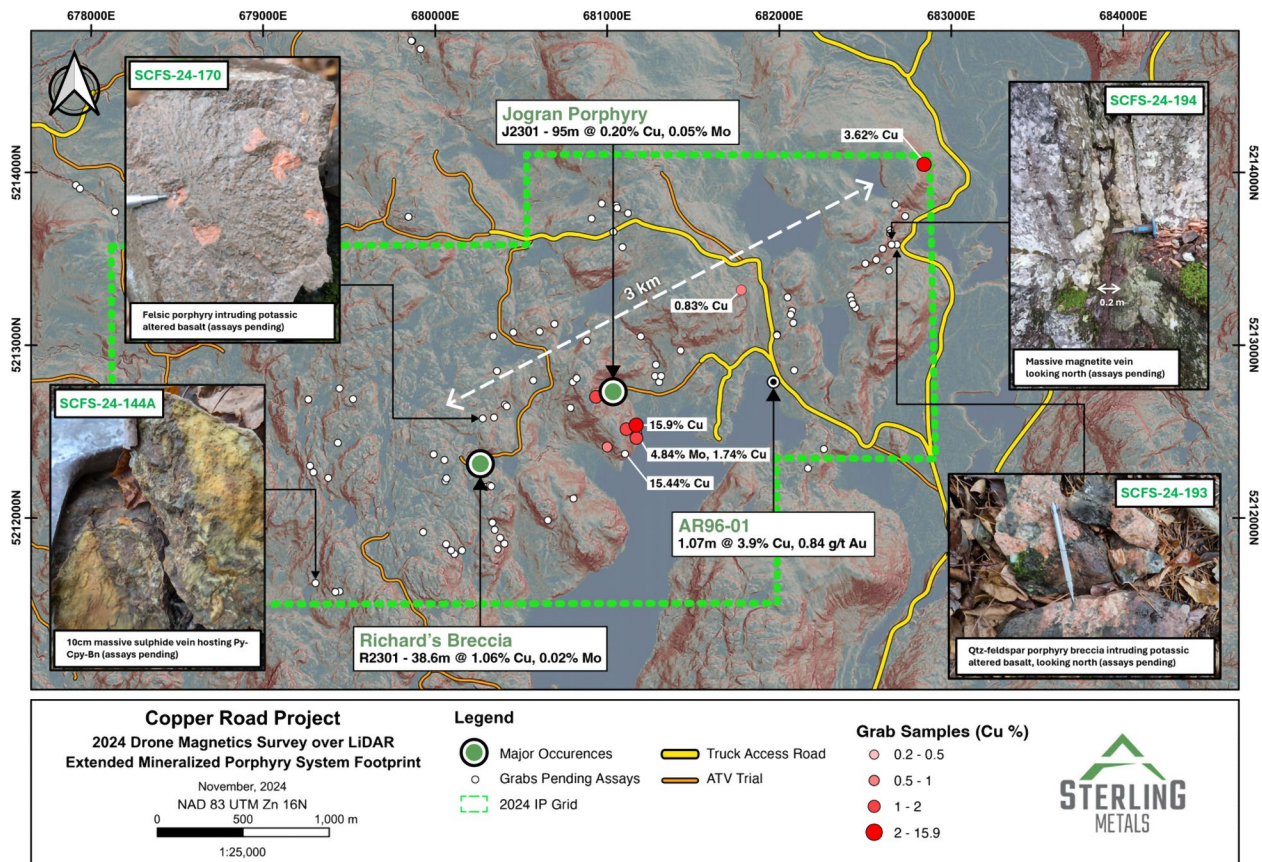


Figure 20. Plan map showing 2024 field work highlighting the expanded approximately 3 km mineralized footprint of the porphyry system (from Sterling Metals Corp., news release, November 19, 2024). UTM co-ordinates in NAD83, Zone 16.

DISTRICT STAFF AND ACTIVITIES

Field activities for 2024 focussed on property visits, community outreach, field trips and mineral occurrence examinations. Staff continued to deliver client services from the office and remotely using electronic communication channels (e.g., telephone, email and video calls). Client requests to access physical documents, receive digital documents remotely, and borrow exploration equipment (e.g., Beep Mats, scintillometer) were accommodated.

The Sault Ste. Marie District Geologist office was staffed by B. Maity, District Geologist, and J. Walmsley (March 2024 to August 2024), District Geological Assistant, who attended regular meetings held by the Sault and District Prospectors Association and participated in health and safety training, mining workshops and conferences. The Sault Ste. Marie District Geologist's office produced monthly updates on mining and exploration activities for use in the annual *Report of Activities* and applications on OGSEarth, provided advice to the different branches within the Ministry of Mines, consulted with prospectors and researchers on geological exploration activities in the District, and provided rock and mineral identification services to the public.

In February and March 2024, B. Maity delivered 4 guest lectures on an introduction to rocks and minerals, identification of geological hand specimens, and the geology of Ontario and Sault Ste. Marie to first-year students of the *Understanding the Earth: The Planet and Its Internal Processes* (GEOL 1022) course at Algoma University, Sault Ste. Marie. In April 2024, B. Maity provided the students with an introductory field course on the Proterozoic Huronian Supergroup and the Archean Ramsey–Algoma granite gneiss suite exposed along Highway 556. Preliminary trips were conducted earlier in March 2024 by B. Maity to plan the route for the field course.

In March 2024, B. Maity participated in the Prospectors and Developers Association of Canada (PDAC) 2024 conference held at the Toronto Metro Convention Centre and presented on the exploration status of gold in Ontario.

In April 2024, B. Maity facilitated the local prospectors and rock enthusiasts field visit to Plummer Township and Bruce Mines area.

In May 2024, B. Maity and J. Walmsley presented a workshop on rocks and minerals identification to students at Holy Family School and Our Lady of Lourdes, both in Sault Ste Marie.

In July 2024, B. Maity organized a two-day field trip in the Michipicoten greenstone belt, jointly provided by Alamos Gold Inc. and the ERGMS bedrock mapping unit of OGS. This field visit was also attended by Magino Mine geologists, the Timmins Resident Geologist Office and the Northeast Regional Manager of the RGP. The first day of the visit took place around Bruyere and Riggs townships, where several recent research studies have been completed on the structural, metamorphic and metallogenic evolution of the area. Properties with historical resources, exploratory trenches, or other mineral inventory sites of notable importance, and areas where Alamos is currently conducting surface mapping and exploration drilling were also visited. The second day of the field visit activities were organized in Bird Township, located to the east side of the Dog Lake area of the Michipicoten greenstone belt. During the visit, recent developments from the bedrock mapping activities of the OGS were reviewed.

B. Maity also organized a field visit to roadside geological stops on Highway 17 to examine the Keweenawan rocks exposed along the east coast of Lake Superior between Chippewa Falls and Alona Bay. This field trip was attended by the Sault District Geologist's office and the Northeast Regional Manager of the RGP.

At the end of July, B. Maity organized a field trip in Elliot Lake to revisit the Huronian Supergroup outcrops along the Elliot Lake transect following Highway 108. The trip was facilitated by B. Maity (RGP, Sault Ste Marie) and M. Easton (ERGMS-OGS, Sudbury) and was attended by members of the Sault and District Prospectors Association, ERGMS staff and RGP staff from Timmins and Sudbury.

In August 2024, B. Maity organized a field visit to roadside geological stops on Highway 17 between Alona Bay and Chippewa Falls, including visits to Mica Bay, Alona Bay and Mamainse Point. The field visit was attended by the staff from the Timmins Resident Geologist's office.

In early September 2024, B. Maity visited the Golden Sky project of Angus Gold in Mishibishu greenstone belt to review their recent drilling and summer prospecting activities.

In early October 2024, B. Maity attended the Northeastern Ontario Mines and Minerals Symposium (NEOMMS) 2024 in Timmins and presented an update on the current state of exploration activities in northeastern Ontario.

Drill Core Storage Site

The Drill Core Library in Sault Ste. Marie was maintained and managed by the staff of the District office throughout 2024. The library was accessed by Radio Fuels for cores stored from the Elliot Lake area. A set of selected cores were relogged, digitally scanned, and spectral analyses were performed by Radio Fuels.

RECOMMENDATIONS FOR EXPLORATION

An Application of Random Forest Classification in Mineral Prospectivity Mapping in the Batchawana Greenstone Belt

Random Forest (RF) is a data-driven iterative and randomized classification and regression tree analysis tool that is an ensemble of individual decision trees where each node of a tree represents a decision (Breiman 2001). Each tree also uses a bagging process called bootstrapping in which a split of two-thirds of the training data (in-bag data) are randomly selected for a given number of repetitions and are used for classification (Breiman 2001). The remaining one-third of data (out-of-bag or OOB data) are used for model validation (Harris et al. 2015). Increasing the number of trees decreases the OOB error and stabilizes at a given number for which minimum error is expected (Harris et al. 2015). For a random subset of input variables used in each node, a search is made for each data split through all the candidate splits to find the optimal split to maximize the purity of the child node without incurring correlation biases between trees (Gislason et al. 2006). The random sampling is repeated for all trees, each of which constitute a new set of in-bag data, resulting in independent predictions for each tree, and a combination of all decision trees vote for the majority class and a probability of membership to each class (Harris et al. 2015). Random Forest (RF) can be applied on categorical, binary, or continuous data (Harris et al. 2015) and does not overfit when more trees are used (Breiman 2001; Gislason et al. 2006).

In this study, lithogeochemical data comprising whole-rock major-element oxide analyses, lithology map and geophysical resistivity maps were used for mineral prospectivity mapping using a data-driven RF model in geographic information system (GIS) software and the results were compared with known mineral occurrences to identify potential areas for further exploration in the Batchawana greenstone belt (BGB; Figure 21).

Table 15. Indexes of alteration used for Random Forest (RF) analysis in this study.

Index	Expressions and Thresholds	Application
CCPI	$100 (\text{MgO} + \text{FeO}) / (\text{MgO} + \text{FeO} + \text{Na}_2\text{O} + \text{K}_2\text{O}); >85$ (Large et al. 2001)	Chlorite alteration of albite, potassium feldspar, sericite; carbonate alteration, pyrite, magnetite (hematite) enrichment
ACNK	$\text{Al}_2\text{O}_3 / \text{Na}_2\text{O} + \text{CaO} + \text{K}_2\text{O} \text{ (m)}; >1.85$	Alumina mobility over alkali depletion in feldspars
Volatiles	$(\text{CO}_2 + \text{H}_2\text{O}^+ + \text{H}_2\text{O}^-); > 3.8 \text{ wt } \%$	H_2O and CO_2 locked in hydrous and carbonate minerals
LOI	$>6 \text{ wt } \% \text{ (mf)}, >3 \text{ wt } \% \text{ (fs)}$	Higher modes of hydrous minerals
AI	$100 (\text{MgO} + \text{K}_2\text{O}) / (\text{MgO} + \text{K}_2\text{O} + \text{CaO} + \text{Na}_2\text{O}); >65$ (Large et al. 2001)	Sericite and chlorite alteration of sodic plagioclase
ISER	$\text{K}_2\text{O} / (\text{K}_2\text{O} + \text{Na}_2\text{O}) \text{ (m)}; >46.4$	Sericite alteration of feldspar

Abbreviations: fs, felsic; m, molar; mf, mafic; wt, weight. Index abbreviations are defined in the text.

Archean rocks in the BGB in the southwestern Abitibi Subprovince, Ontario (Corfu and Grunsky 1987; and references therein), host extensive occurrences of magnetite–pyrite–chert and base and precious metals mineralization in hydrothermally altered supracrustal rocks along shear zones and proximal to felsic plutons (Grunsky 1991). Evidence of alteration in mafic rocks includes breakdown of pyroxene and olivine into amphibole and chlorite, plagioclase into saussurite and epidote, and pervasive carbonatization. Felsic rocks also exhibit evidence of sericitization and carbonatization (Grunsky 1991). The degree of metamorphism was low- to medium-grade greenschist facies in the interior of the belt, reaching hornblende-hornfels facies towards the margin along the contact with intrusive plutons (Grunsky 1991).

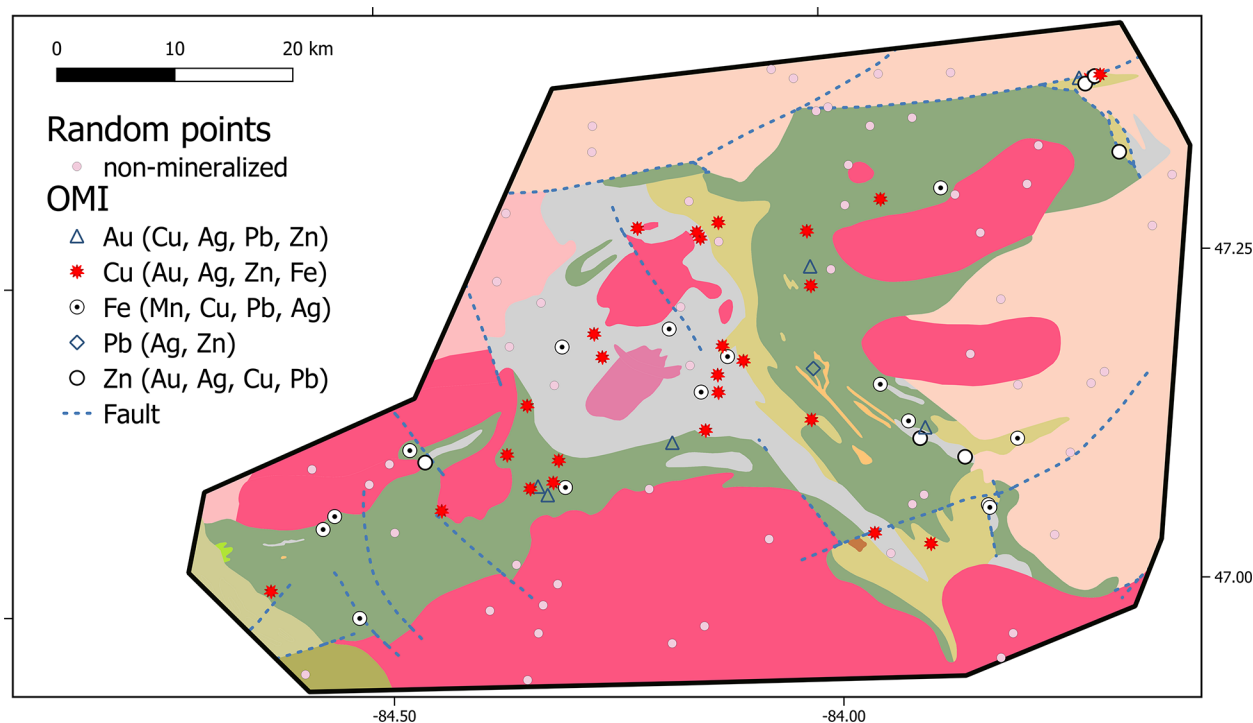


Figure 21. Geological map of Batchawana greenstone belt showing the location of selected 56 known mineral occurrences (Ontario Geological Survey 2024; geology *modified after* Ontario Geological Survey 2011) and 56 randomly created non-mineralized locations at balanced (1:1) ratio. Latitude and longitude co-ordinates, in degrees, are shown on the vertical and horizontal axes, respectively.

Methods

A subset of publicly available data (MRD 250, Haus and Pauk 2010) was used to determine multiple indexes of alteration (Table 15) from select altered samples that are assumed to reflect alteration patterns related to potential mineralization in the BGB. Whole-rock major element oxide data were used to determine 6 indexes of alteration: excess volatiles by loss-on-ignition (LOI), Hashimoto alteration index (AI), chlorite-carbonate-pyrite index (CCPI), sericite alteration index (ISER), total volatile content, and aluminum–calcium–sodium–potassium (ACNK) index (*see* Table 15). Normal probability plots, or other methods, were used to identify samples with anomalous concentrations, or thresholds (*see* Table 15). A set of 6 predictor maps, 1 for each index (*see* Table 15), was produced using a 1 km buffer around each geochemical data point and interpolating each data point using inverse distance weighted (IDW) method, resulting in 6 raster maps (Figure 22 A–F). A simplified geology map with 6 rock type classes was rasterized as a rock type predictor map (Figure 22G). The logarithm (base 10) of the resistivity data collected for the Batchawana area (GDS 1034, Ontario Geological Survey 2003) was interpolated into a raster predictor map (Figure 22H). A pixel size of 50 m was used for generating all predictor raster maps. To represent locations of mineralization, 56 known mineral occurrences (OMI) were selected, whereas 56 unmineralized locations were randomly generated in the GIS software to create a balanced training dataset (1:1 ratio for mineralized vs unmineralized data points) to be used in the RF model (Figure 21). The random selection of unmineralized locations was generated by using a 1 km buffer zone around known OMI points. Research has shown that the best predictive powers in RF models are obtained using a balanced dataset (Behnia et al. 2023). These 112 data points were used as training locations in a binary vector format where OMI points were assigned a value of 1 and the randomly generated non-OMI points were assigned a value of 0. The RF modelling was carried out using ArcGIS Pro 3.1[®] software, where the number of trees was set at 500, and 80% of data was assigned for training and 20% of data was excluded for validation.

Results

The highest coincidence of anomalies in CCPI, LOI and total volatiles occurs in the areas of mafic metavolcanic rocks containing higher abundances of hydrous minerals. The samples with AI greater than 65 and CCPI greater than 85 indicate carbonate–chlorite–pyrite alteration (Large et al. 2001), most dominant in mafic tholeiitic and komatiitic metavolcanic units and, to a lesser extent, in the mafic intrusive rocks. The ACNK anomalies are observed predominantly in the mafic to felsic metavolcanic flows and, to a lesser extent, in the intrusive rocks, suggesting alkali depletion and alumina enrichment. The anomalies in AI and ISER also correlate mainly with the areas of exposed metavolcanic sequences. The intermediate to felsic metavolcanic flows exhibit a higher range in ISER (51 to 91), suggesting higher modes of sericitization compared to the mafic rocks (ISER 47 to 84). The felsic rocks also exhibit diagenetic alteration, as indicated by CCPI less than 15 and AI less than 20 (Large et al. 2001).

The RF prediction analysis produced high accuracy for the training data compared with moderate accuracy for the validation data with a median accuracy of 0.652 (Table 16). The F1 accuracy results obtained using the training data is higher because of the bias that exists in data-driven methods toward known mineralized bodies (Behnia et al. 2023). Because of the relatively moderate accuracy of the RF classifier used in this study, 4 OMI and 3 non-OMI points were misclassified (Figure 23B). The variable importance analyses indicated that LOI and resistivity values, as well as proximity to favourable rock types, were the most important predictors while ACNK predictor maps were assigned the lowest importance (Table 17). However, all these predictors show overall high importance, which indicates overall suitability of these variables in data-driven RF modelling. It has been shown that predictor variable importance is sensitive to the area of interest and the factors contributing to mineralization in a specific area (Behnia et al. 2023).

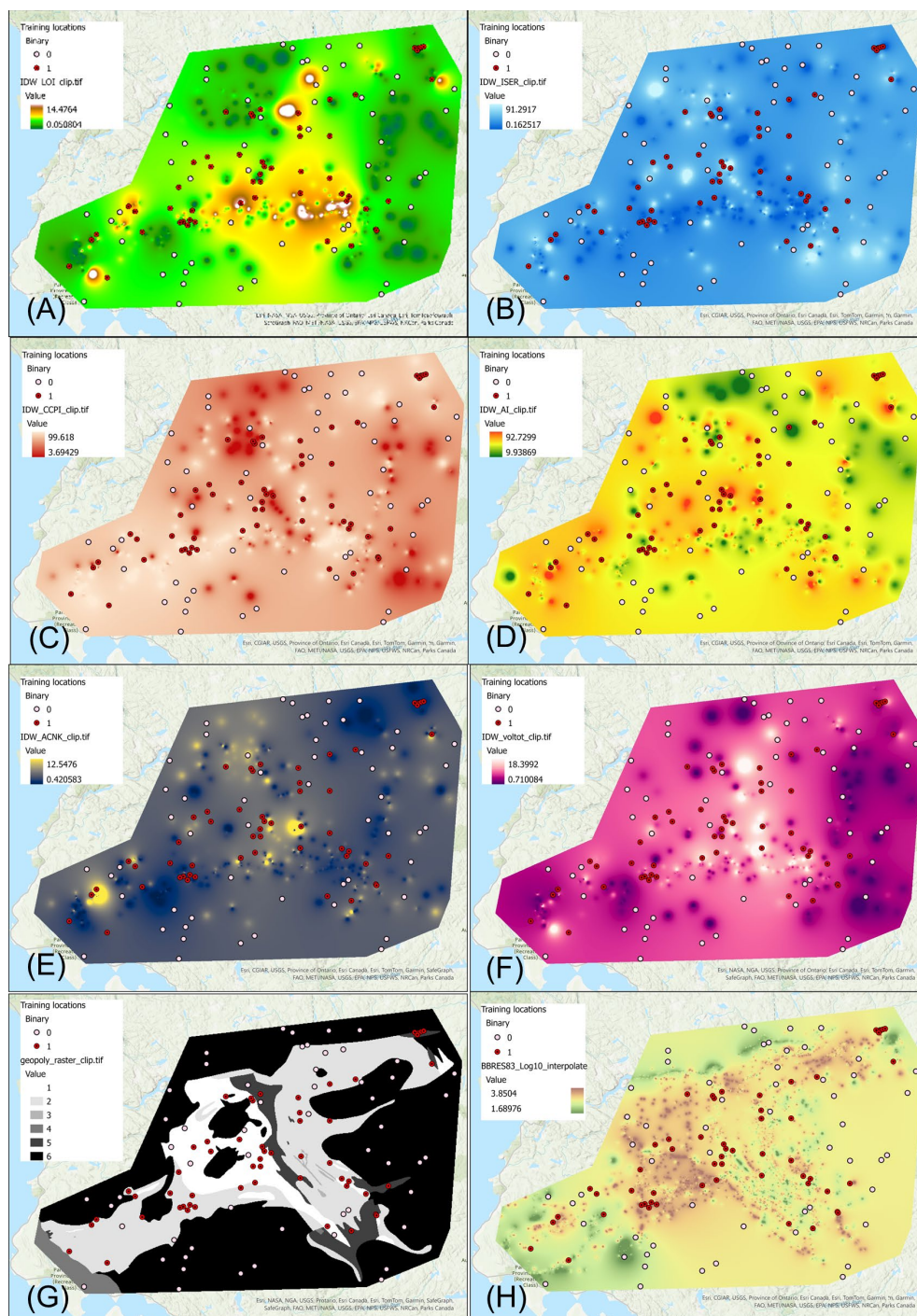


Figure 22. Inversely distance weighted (IDW)-interpolated raster predictor maps of (A) LOI, (B) ISER, (C) CCPI, (D) AI, (E) ACNK and (F) total volatiles (voltot), using threshold values listed in Table 15, with 56 OMI and 56 non-OMI points from the Batchawana greenstone belt (see Figure 21) used as training locations. For calculation, a very small radius of 1 km around each geochemical data point (not shown) were considered; (G) raster map of simplified geology (1, metasedimentary rocks; 2, mafic to intermediate metavolcanic rocks; 3, mafic intrusive rocks; 4, Keweenaw; 5, felsic to intermediate metavolcanic rocks; 6, felsic intrusive rocks.); and (H) IDW-interpolated resistivity map for the study area.

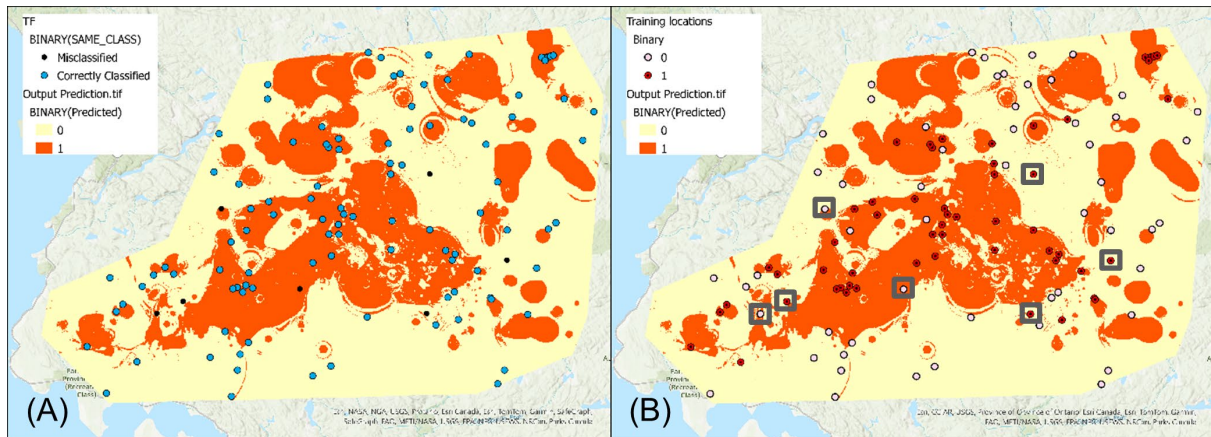
Table 16. Statistics for training (80%) and validation (20%) data obtained during Random Forest (RF) model training and prediction.

	Training Data		Validation Data	
	F1-score	Accuracy	F1-score	Accuracy
Model Training (non-OMI point)	0.99	0.99	0.60	0.65
Model Training (OMI point)	0.99	0.99	0.69	0.65
RF Prediction (non-OMI point)	0.98	0.98	0.71	0.65
RF Prediction (OMI point)	0.98	0.98	0.56	0.65

Table 17. Statistics for predictor variable importance during Random Forest (RF) model training and prediction.

Predictor variable	Importance	%	Importance	%
LOI	1.24	17	1.00	14
Resistivity	0.96	13	0.98	14
Geopoly_raster	0.97	13	0.92	13
ACNK	0.80	11	0.90	13
AI	0.80	11	0.90	13
Volatile total	0.91	12	0.80	11
ISER	0.84	11	0.76	11
CCPI	0.83	11	0.69	10

There are a few caveats in a data-driven RF modelling approach. Data-driven decision tree-based models have bias towards known mineral occurrences which results in lower accuracy in test data compared with training data, as shown in Table 16. Not all OMI points are well correlated to a specific deposit type (e.g., VMS type vs. orogenic gold). Finally, Random Forest algorithm in ArcGIS Pro 3.1 permitted only classification of mineralized vs unmineralized zones but did not allow calculation of probability within the mineralized zone, which will be addressed in a future communication. Addressing these caveats will result in better predictability of the mineral occurrence map for a particular deposit type.

**Figure 23.** Random Forest model prediction of an area classified as mineralized (orange area code 1) with 4 OMI and 3 non-OMI locations being misclassified, as indicated by black dots in (A) and marked by black squares on (B), where 1 indicates known OMI locations as shown in Figure 21. Note that ArcGIS Pro 3.1 does not allow calculation of a probability map.

Recommendations

The predictive mineral occurrence map (*see* Figure 23) shows general areas for mineralization based on the input data that constitute known and unknown locations for mineral occurrences, coupled with a range of predictor variable maps. Although there are more known OMI points in the area than the 56 points considered in this study, many of these points overlap with the predicted area shown in Figure 23. This indicates that data-driven RF models can be used for an area with relatively small numbers of known locations of mineralization to predict prospective areas for further mineral exploration. However, probability calculation within the Radom Forest algorithm is currently not available within the ArcGIS Pro 3.1, and instead only a classification map is generated. To constrain areas with the highest probability above a certain threshold of finding mineral occurrences, probability calculation for the area classified as mineralized will be necessary. This issue will be resolved in a future article. The mineralization prediction map generated in this study should not be used as a target map, rather as an example of how a data-driven decision tree-based Random Forest model can be used as an exploration tool in a poorly explored area.

OGS ACTIVITIES AND RESEARCH BY OTHERS

The following OGS and other academic research activities were active within the Sault Ste. Marie District in 2024:

- Campos et al. (2024) investigated the role of late deformation and metamorphic overprint on the Archean intrusion-related Magino Gold Deposit, Ontario, Canada.
- Legros et al. (2024) investigated mantle xenoliths in a Mesoproterozoic lamprophyre dike near Elliot Lake to show that post-Archean niobium–uranium–REE enrichment in subcontinental lithospheric mantle beneath the Superior Craton is a result of carbonated silicate melt metasomatism of previously depleted lithospheric mantle.
- Ma, Lafrance and Montreuil (2024) studied the formation of a Neoarchean auriferous fault zone network in the southern Michipicoten greenstone belt (MGB) of the Superior craton. Three deformation events associated with episodic gold mineralization were revealed in the host granitoid (*circa* 2745 Ma). These events indicated that the localization of deformation for the formation of these fault zones was controlled by rheological heterogeneities and syndeformation fluids.

A list of publications received by the Sault Ste. Marie RGP District is given in Table 18.

Table 18. Publications received by the Sault Ste. Marie Resident Geologist District in 2024.

Title	Author	Type and Year of Publication
Recommendations for Exploration, 2023–2024	Resident Geologist Program	Ontario Geological Survey, Resident Geologist Program, Recommendations for Exploration 2023–2024
Ontario Groundwater Geoscience 2024 Open House	A.K. Burt, L.M. Colgrove, K.J.J. Kalmo, D. Ford, S. Holysh and H.A.J. Russell	Ontario Geological Survey, Open File Report 6406 (2024)
Ontario Airborne Geophysical Surveys, Magnetic Gradiometer Data, Grid and Profile Data (ASCII and Geosoft® Formats) and Vector Data, Winisk River Area	Ontario Geological Survey	Ontario Geological Survey, Geophysical Data Set 1069 (2024)
Airborne Magnetic Gradiometer Survey, Colour-filled Contours of the Residual Magnetic Field, Winisk River Area	Ontario Geological Survey	Ontario Geological Survey, Geophysical Data Set 1069, scale 1:50 000, colour (2024)
Airborne Magnetic Gradiometer Survey, Shaded Colour Image of the First Vertical Derivative of the Residual Magnetic Field and Keating Correlation Coefficients, Winisk River Area	Ontario Geological Survey	Ontario Geological Survey, Geophysical Data Set 1069, scale 1:50 000, colour (2024)

Title	Author	Type and Year of Publication
Surficial Geology of the Island Lake Area Southeast, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3676, scale 1:100 000 (2024)
Surficial Geology of the Opasquia Lake Area Southwest, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3677, scale 1:100 000 (2024)
Surficial Geology of the Opasquia Lake Area Southeast, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3678, scale 1:100 000 (2024)
Surficial Geology of the Deer Lake Area North, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3689, scale 1:100 000 (2024)
Surficial Geology of the North Spirit Lake Area Northwest, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3690, scale 1:100 000 (2024)
Surficial Geology of the North Spirit Lake Area Northeast, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3691, scale 1:100 000 (2024)
Surficial Geology of the Deer Lake Area South, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3702, scale 1:100 000 (2024)
Surficial Geology of the North Spirit Lake Area Southwest, Northern Ontario	C. Gao and K.H. Yeung	Ontario Geological Survey, Preliminary Map P.3703, scale 1:100 000 (2024)
Report of Activities 2023, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	P.M. Malegus, E.G. Amyotte, R.L. Price, C.E. Kurcinka, T.K. Pettigrew, G. Meyer, N. Sabiri, A.E. Roziere-Howard and M.D. Levesque	Ontario Geological Survey, Open File Report 6407 (2024)
Report of Activities 2023, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	S.V. Churchley, G.F. Paju, T.K. Pettigrew, G. Meyer, C.E. Kurcinka, N. Sabiri and S.A. Ferguson	Ontario Geological Survey, Open File Report 6408 (2024)
Report of Activities 2023, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	D.A. Campbell, J.R.B. Jonsson, G. Meyer, T.K. Pettigrew, C.E. Kurcinka, N. Sabiri and J. Swiercz	Ontario Geological Survey, Open File Report 6409 (2024)
Report of Activities 2023, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	V. D'Angelo, M. Krukowski, B.K. Maity, P. Bousquet, C.M. Daniels, S.L.K. Hinz, G. Meyer, N. Sabiri, J. Swiercz and C.J. Adrianwalla	Ontario Geological Survey, Open File Report 6410 (2024)
Report of Activities 2023, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts	P.J. Chadwick, A.S. Pélouquin, J. Suma-Momoh, B.B. McKinnon, P. Bousquet, P.S. LeBaron, C.M. Daniels, S.L.K. Hinz, G. Meyer and N. Sabiri	Ontario Geological Survey, Open File Report 6411 (2024)
Report of Activities 2023, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Ontario Districts, and Petroleum Operations Centre	L.A. Mancini, M. Dorado-Troughton, J. Swiercz, P.S. LeBaron, S.L.K. Hinz, G. Meyer, N. Sabiri and L. Fortner	Ontario Geological Survey, Open File Report 6412 (2024)
OGS Virtual Showcase 2024	Ontario Geological Survey	Ontario Geological Survey, Virtual Showcase 2024, November 26–28
Ambient Groundwater Geochemical and Isotopic Data for Northeastern Ontario, 2016–2018	K.M. Dell and S.M. Hamilton	Ontario Geological Survey, Miscellaneous Release—Data 401
Summary of Field Work and Other Activities, 2024	Ontario Geological Survey	Ontario Geological Survey, Open File Report 6413 (2024)

MINERAL DEPOSITS NOT BEING MINED

Mineral deposits not currently being mined in the Sault Ste. Marie District and Wawa area in 2024 are listed in Tables 19 and 20, respectively.

Table 19. Mineral deposits not being mined in the Sault Ste. Marie District, with the exception of the Wawa area, in 2024.

Abbreviations					
AF	Assessment Files	MP	Miscellaneous Paper		
AR	Annual Report	MRC	Mineral Resource Circular		
CAMH	Canadian and American Mines Handbook	OBM	Ontario Bureau of Mines		
CMH	Canadian Mines Handbook	ODM	Ontario Department of Mines		
GDIF	Geoscience Data Inventory Folio	OFR	Open File Report		
GR	Geological Report	OGS	Ontario Geological Survey		
MDC	Mineral Deposit Circular [No.15–] [formerly Mineral Resources Circular, No.1-14]	SMDR	Source Mineral Deposit Records		
MDIR	Mineral Deposit Inventory Record	SSMP	Sault Ste. Marie Plans		

Deposit/Township/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status	AMIS ID
Pater Mine <i>Spragge</i> 41J/02NE	Cu, Au, Ag	Total production was 70 460 264 lbs Cu. Estimated 2 000 621 tons @ 1.8% Cu.	MRC 12, p.65. GR 76, p.90-94.	Past Producer 1960–1968	07955
Bar-Fin Mine <i>Thompson</i> 41J/03NE	Cu	Production of 120 000 lbs of Cu from 1500 tons of ore. 1.82% over 3 feet and 9.27% over 1.9 feet.	MRC 12, p.67 GR 17, p.62-63	Past Producer 1906	07968
Bald Dome prospect <i>Plummer Add'l.</i> 41J/05SW	Cu	80 to 100 feet true width averaging 0.25% Cu, diamond-drill core.	MRC 12, p.52 AF 0014	showing	07885
Bruce Mines <i>Plummer Add'l</i> 41J/05SW	Cu, Ag	40 000 ton @ 1.8% Cu above 155-foot level Bruce Mines Taylor site.	MDC 12	Past Producer 1915–1921	07888 - 07891
Campbell–Dukes prospect <i>Plummer Add'l</i> 41J/05SW	Cu	33 000 ton @ 1.2% Cu in a 230 by 8 by 220-foot block	MRC 12, p.54 AF 0014	Past Producer 1956	07883
Rock Lake Mine <i>Aberdeen</i> 41J/05NE	Cu, Ag	1 524 000 lbs Cu from 43 300 tons of ore	MDC 12, p.14	Past Producer 1899–1903	07781
Havilah Mine–Ophir Mine <i>Galbraith</i> 41J/05NE	Au, Ag, Cu	1 main vein, 2 – 150-foot shafts, 1 – 183-foot adit In 1911, 1030 oz Au and 214 oz Ag from 6589 tons ore milled.	MRC 13, p.18 OBM 1893, AR v.3, p.37-45	Past Producer 1892–1894, 1900, 1910 and 1911	07851
Steinberg Mine <i>Plummer Add'l</i> 41J/05SW	Cu	124 000 tons @ 1.1% Cu (drill indicated) for a length of 200 feet to a depth of 200 feet.	OGS 1969, MRC 12, p.56-57 AF Plummer-0014- 0017.	Past Producer 1919	07884
Stobie Mine–Rainbow Mine <i>Johnson</i> 41J/05SW	Cu, Ni, Au	9 tons of ore shipped from 100-foot level, 280 feet of lateral work. Shaft is 160 feet deep.	MRC 12, p.34-35. MRC 2, p.74. AF Index plan	Past Producer 1899–1901	08013
Bilton option <i>Patton</i> 41J/06SE	Cu	95 160 tons @ 1.72% Cu over a width of 7.3 feet to a depth of 200 feet.	ODM 1953, GR 17, p.55-58 AF	Past Producer Pre-1956	08093
Boyea Lake Adit and East Zones <i>Montgomery</i> 41J/06NE	Cu	50 000 tons @ 2.5 to 3% Cu 135 150 tons @ 2.32% Cu across 7 feet over 1068 feet. 75 000 tons @ 1.0% Cu across 20 feet over a length of 300 feet.	Sudbury Contact Mines AR 1971 MRC 12, p.43-44 AF	Past Producer Pre-1942	08060
Crownbridge (Cannon) prospect <i>Kamichisitit</i> 41J/06NE	Cu	415 000 tons @ 1.8% Cu over a width of 6.5 feet.	MRC 12, p.94 AF	Past Producer 1966–1967	08018

Deposit/Township/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status	AMIS ID
Glagoma Mine <i>Gladstone</i> 41J/06SE	Cu	In 1917, 2 shafts sunk to 250 feet	MRC 12, p.25-26 OGS 1963, GR 17 p.52-55	Past Producer 1917 and 1962	07865
Goulding Mine <i>Cobden</i> 41J/06SE	Cu	In 1962, 26.3 dry tons shipped @ 1.45% and 222.5 dry tons shipped @ 1.34%.	MRC 12, p.19 OGS 1964, GR 20, p.62-65	Past Producer 1962	07823
North Montgomery – Grand Portage Mine <i>Gould</i> 41J/06NW	Cu	No production or reserve data found.	OGS 1969, MRC 12, p.27-28. OGS 1899, AR v.8, pt.1, p.37-38. SMDR 00463 or MDIR A0229	Past Producer 1899	07871
Milgate (Abbicani) prospect <i>Nouvel</i> 41J/06NE	Cu	105 750 tons @ 1.08% Cu (drill indicated) A Zone: Length – 600 by Width – 10 by Depth – 235 feet	OGS 1969, MRC 12, p.97. ODM 1957, MRC 2, p.71.	1936–1955, 1956 Development work	08076
Principle Strategic Minerals prospect <i>Gladstone</i> 41 J/06SE	Cu	112 300 tons containing 3 128 196 lbs Cu	MRC 12, p.26, GR 17, p.50-51. AF	Pre-1957	07864
Sheba prospect <i>Nouvel</i> 41J/06NE	Cu	Length – 1000 feet by Width – 3 feet on surface @ 0.59% Cu, weighted diamond-drill assays.	MRC 12, p.98	1956–1957 Development work	08077
Twin Lakes prospect <i>Esten</i> 41J/07SE	Cu	Probable - 76 900 tons @ 1.73% Cu over 8-foot width, drill indicated.	MRC 12, p.23 AF Esten 0010-D1	1957 Trenching and diamond drilling	07841
Bi-Ore Mine <i>Sagard</i> 41J/10NW	Cu	2726 tons of concentrate containing 1 647 079 lbs of Cu.	ODM 1951, AR. v.60, pt.2, p.2. MRC 12, p.70-71	Past Producer 1947–1949	07931
Cheney Mine <i>Gould</i> 41J/11SW	Cu	39 405 tons @ 3.97% Cu (drill-indicated) 3500 tons mined in 1967.	MRC 12, p.26-27 ODM, 1929, v.38, pt.7, p.10-15	Past Producer 1966–1967	07874
Copper Prince Mine <i>Kamichisitit</i> 41J/11SE	Cu, Au	4 shoots 310 by 6.3 feet averages 3% Cu 60 by 9.7 feet averages 1.9% Cu 45 by 6.6 feet averages 2.3% Cu 110 by 9.6 feet averages 0.9% Cu Weighted average of 4 diamond-drill holes, 2.7% Cu over 7 feet and 0.03 oz/ton Au.	MRC 12, p.93-94 GR 178, p.66-67 SMDR File 00823 MP 57, p.87	1928–1929 Diamond drilling, trenching and grabs. 1973 mining operations suspended after shipping small quantity of Cu concentrate.	08019
Jardun Mine <i>Jarvis</i> 41K/09NE	Pb, Zn, Ag, Cu, Au	No.1 and 4 zone reserves are 20 000 tons averaging 7.25% Pb, Zn and 1.52 oz/ton Ag. No.3 zone reserve estimate is 19 367 tons averaging 9.56% Pb and Zn with 1.10 oz/ton Ag.	MRC 12, p.32-33 AR v.67, pt.2. p.108- 109.	Past producer 1954–1957	08007
Kerr Scott (Algoma Galena) <i>Deroche</i> 41K/09NE	Pb, Zn, Ag, Au	1859 tons of hand-cobbed ore recovered. Deposit reserves have not been calculated.	MRC 12, p.21-22 AR v.49, pt.1, p.223 ODM 1928, AR v.37, pt.3, p.72-73	Past Producer 1939	07833
Goulais River, Doughty, Eagle Mine, Tribag, Edwards. <i>Vankoughnet</i> 41K/16SW	Cu, Ag	250 000 tons @ 2.35% Cu, 0.26 oz/ton Ag in 3 zones (drill-indicated).	GDIF #75, OBM 1905, AR v.14, pt.1 OGS 1970, MP 46, p.92-93 AR 1973, MP 57, p.86.	Past Producer 1900	07974
Kristina Mine (Supercrest) (Superior) <i>LaVerendrye</i> 41K/16NE	Cu	369 350 tons @ 1.95% Cu in No.4 and No.6 Shaft Zone, 10 000 tons @ 4% Cu and 200 000 tons @ 2.53 % Cu.	MRC 12, p.75 MRC 1, p.43 OBM 1902, AR v.11, p.274 OBM 1908, AR v.17, p.79	Past Producer 1903–1907 1952–1957: 22 000 feet of diamond drilling.	08040

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Deposit/Township/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status	AMIS ID
Prace–Sill Lake Mine <i>Vankoughnet</i> 41K/16SW	Pb, Zn, Ag	20 000–60 000 tons @ 12 oz/ton Ag, and 20 000 tons @ 41.65 oz/ton Ag, and 33.7% Pb over 1.13 feet width.	AF SSMP Vankoughnet 16, 17.	Past Producer 1975, 1979, 1981, 1983–1984 and 1985–1987	07976
Caputo–Just (Caputo–Thompson, Ontex) <i>Wishart</i> 41N/01SW	Cu	475 tons @ 1.18 % Cu recovered from 3 zones	MRC 12, p.78 MP 25, p.5	Past Producer 1968	07985
Coppercorp Mine <i>Ryan</i> 41N/02SW	Cu, Ag, Au	1.02 million tons @ 1.16% Cu production.	MRC 12, p.45–46 ODM 1953, AR 62, pt.4, p.18–24 AF – Montreal Mining Co. SSMP-0012 AF SSMP Ryan -15, p.30 AF SSMP Ryan -37 (cd). 2.47257, p.3.	Past Producer 1965–1972	07937, 07938, 07939, 08061
Glenrock (Rockdale) <i>Palmer</i> 41N/02SE	Co, Au, Cu	Several zones. Main zone Length – 250 by Width – 3.5 feet (drill indicated) 1953, 11 diamond-drill holes, failed to show continuity with depth, best assay 16% Co.	MRC 12, p.103 MRC 10, p.20	Glenrock 1952 Rockdale 1958	08081
Jogran prospect <i>Ryan</i> 41N/02SE	Cu, Mo	Reserve estimate: 18 M tons @ 0.19% Cu and 0.05% MoS ₂	MRC 12, p.60–61 MRC 7, p.11 AF RYAN SSMP -15, p.30	1965–1966: diamond drilling	07924
Mamainse Mine <i>Ryan</i> (A.McDonell Location - west of <i>Ryan</i>) 41N/02SW	Cu	Vein Length – 1500 by Width – 13 feet 3 shafts sunk to depths 60, 280 and 320 feet. No production recorded.	MRC 12, p.57 AR v.62, pt.4, p.23 MRC 2, p.79	Past Producer 1882–1884	08050
Maricona prospect (Rankin Location - Point Aux Mines) <i>Slater</i> 41N/02NE	Cu	295 405 tons @ 1.17% Cu (1098 by 345 by 8.1 feet)	MRC 12, p.58 AF Rankin Mnrl 1964, 0013-A1 AF Rankin Mnrl 1956, 0012 AF Rankin Mnrl 1949, 0017A	Past Producer 1865–1966 and 1949, 1955–1956	07902 Same as 07899
Pancake Lake (Richards) <i>Kincaid</i> 41N/02SE	Cu	310 by 21.5 by 310 feet @ 0.76% Cu developed prospect.	MRC 12, p.38	1952 intermittent until 1964	08026
Tribag Mine <i>Nicolet</i> 41N/02SE	Cu, W, Ag, Au	4 zones (Breton, West, East and South) Reserve estimate 2004: Breton, 40 M tons @ 0.2% Cu above 300 m. East Breccia, 125 M tons @ 0.13% Cu and 0.04% MoS ₂ West Breccia, 0.1 M tons @ 0.6–1.0% Cu.	MRC 12, p.80 AF SSMP Ryan -15, p.30	Past Producer 1967–1973 Production from Breton and West Breccia zones.	08068
Goulais River <i>Nahwegezhic</i> 41O/04SW	Fe	Algoma Ore Division Iron Range: 25–40% total iron. Estimated reserves 30 480 000 tons of iron pellets in Cowie Lake Section. McPhail deposit (southern extension): 31% total iron, est. Reserves 5 080 000 tons of iron pellets.	MRC 11, p.41–42 OGS GR 192, p.49–56	1910–1944 Development work 1963–1966 diamond drilling, trenching, metallurgical studies.	08065

Note: This table contains tonnage and grade estimates, referred to as “reserves” (indicated, possible, probable), which were determined at various times by methods largely unreported. Unless specifically indicated, it must be assumed that these estimates are not in compliance with the reporting standards required by National Instrument 43-101.

Abbreviations: AMIS = Abandoned Mine Information System; NTS = National Topographic System; Add'l=Additional.

Unit abbreviations used: lbs = pounds; M = million; oz = ounce(s).

Table 20. Mineral deposits not being mined in the Wawa area in 2024.

Abbreviations					
CMH	Canadian Mines Handbook	OFR	Open File Report		
GR	Geological Report	RGF	Resident Geologist Files		
Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status	AMIS ID
Alden–Goudreau (past producer) <i>Cowie</i>	Au	170 000 tons @ 0.50 oz Au per ton	CMH 1937–1943	Diamond drilling 2011	00867
Betty Lake Iron Range <i>Knically</i>	Fe	1 570 140 t @ 39.5% Fe	RGF	Inactive. Bulk sampled 1999	
Big Lake Iron Range <i>Corbiere</i>	Fe	302 150 tons per 100 feet @ 36.6% Fe	GR 153	Last active exploration 1955	
Braminco prospect <i>Brackin</i>	Au	100 000 tons @ 0.15 oz Au per ton (#21 Vein); 23 000 tons @ 0.31 oz Au per ton (#7 Vein); 5000 tons @ 0.26 oz Au per ton (B Vein)	RGF	Last explored 2004	00911
Cline gold mine (past producer) <i>Jacobson</i>	Au	204 000 tons @ 0.221 oz Au per ton (88-60 Zone)	NI 43-101 Rpt. 30/11/2009	Diamond drilling 2008	00901
Edwards Mine (past producer) <i>Jacobson</i>	Au	96 000 t @ 11.3 g/t Au (at the end of 2000)	RGF	Dewatering and diamond drilling 2011	00898
Ego Mines Claims <i>Abotossaway</i>	Au, Cu	7 mineralized zones; W-8 Zone hosts 442 080 t @ 2.6 g/t Au, 1.91% Cu	OFR 5587	Inactive	00011
Goudreau Zone <i>Finan</i>	Au	Indicated resource: 220 667 t @ 12.0 g/t Au (85 262 ounces); Inferred resource: 169 027 t @ 10.3 g/t Au (55 730 ounces)	RGF	Diamond drilling 2010	00302
G.W. Macleod Mine (past producer) <i>McMurray/ Chabanel</i>	Fe	18 700 000 t (blocked out) @ 31% Fe	OFR 5990	Mine closed in 1998	03068
Josephine–Bartlett Iron Range <i>Corbiere</i>	Fe	7 555 788 t @ 58.36% Fe	OFR 5578	Diamond drilled 1946	00297
Josephine Mine (past producer) <i>Corbiere</i>	Fe	3 965 00 tons @ 51.65% Fe, 14.92% Si, 1.88% S	RGF	Mine cave-in in 1946 Inactive.	00304
Jubilee–Surluga property* (past producer) <i>McMurray</i>	Au	Inferred resource: 16.2 Mt @ 1.62 g/t Au Indicated resource: 14.7 Mt @ 1.79 g/t Au, 842 000 oz Au	NI 43-101 Rpt. 30/09/2024 (resource effective 28/08/2024)	Past producers (8) 1902– 1991. Active exploration and diamond drilling 2011-2024	00860
Kremzar Mine (past producer) <i>Finan</i>	Au	229 777 t @ 7.65 g/t Au	RGF	Active exploration 2000	00905
Lakemount property <i>Esquega</i>	Ni, Cu	Inferred resource: 3 048 000 t @ 0.35% Ni, 0.20% Cu, 0.13 g/t Pt, 0.09 g/t Pd	NI 43-101 Rpt. Platinum Group Metals 21/01/2005	Diamond drilling 2003– 2004	04139
Lochalsh Zone (past producer) <i>Finan</i>	Au	Probable reserves: 185 450 t @ 5.6 g/t Au (33 161 ounces); Indicated resource: 252 755 t @ 5.3 g/t Au (42 875 ounces); Inferred resource: 210 160 t @ 6.4 g/t Au (43 083 ounces)	RGF	Diamond drilling 2010	00903

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Deposit Name/ Township	Commodity	Tonnage-Grade Estimates and/or Dimensions	Reserve References	Status	AMIS ID
Lucy Iron Range (past producer) <i>Chabanel</i>	Fe	13 780 000 t @ 33.2% Fe	RGF	Mine closed 1970	03065
Magnacon Mine (past producer) <i>Mishibishu Lake area</i>	Au	1.47 million tons average 0.19 oz Au per ton (drill-indicated). Past producer 1990, 19 397 oz from 163 366 tons	CMH 1997–1998, p.204	Underground exploration 2004. Drifting westward toward Mishi Mine.	00847
Magpie Iron Range (past producer) <i>Leclaire</i>	Fe	332 400 t @ 36% Fe	RGF	Mine closed 1921. Underground mine.	00299
Markes occurrence <i>Jacobson</i>	Au	65 000 t @ 5.75 g/t Au	RGF	Diamond drilling 2010	08719
Minto Mine South property <i>McMurray</i>	Au	Indicated resource: 105 000 t @ 7.5 g/t Au (25 000 ounces @ 3.5 g/t cut-off) Inferred resource: 354 000 t @ 6.6 g/t Au (75 000 ounces @ 3.5 g/t cut-off)	NI 43-101 Rpt. 31/12/2018	Active exploration and diamond drilling 2018– 2024	04132
Murphy–Algold– Amherst gold mine (past producer) <i>Abotossaway</i>	Au	248 800 tons @ 0.305 oz Au per ton	RGF	Diamond drilling 2003	00884
Nudulama prospect <i>Leeson</i>	Au	579 325 t @ 0.194 oz Au per ton	RGF	Inactive	00912
No.8 Zone <i>Finan</i>	Au	90 700 t @ 6.9 g/t Au	RGF	Exploration 1997	00905
Pine Zone <i>Finan</i>	Au	70 000 t @ 6.4 g/t Au	RGF	Inactive	
Ranson Mine <i>Rabazo</i>	Au	30 300 t @ 12.4 g/t Au	RGF	Diamond drilling 2001	00876
Renabie Mine (past producer) <i>Leeson</i>	Au	1 million t @ 0.2 g/t Au. Past producer 1 100 000 oz Au	RGF	Rehabilitated	01013
Ruth Iron Range (past producer) <i>Chabanel</i>	Fe	34 608 000 t @ 30.9% Fe	RGF	Diamond drilling 1967 by Algoma Ore Company Ltd.	03072
Shenango Mine <i>Hawkins</i>	Au	37 440 t @ 4.3 g/t Au	RGF	Inactive	00916
Shihan VMS property/ Conboy Lake, Meath and Rennie	Zn, Pb, Cu	Indicated resource: 199 699 t @ 3.81% Zn, 0.21% Pb, 0.09% Cu, 91.82 g/t Ag, 0.30 g/t, 0.30 g/t Au Inferred resource: 44 362 t @ 4.30% Zn, 0.20% Pb, 0.09% Cu, 72.82 g/t Ag, 0.30 g/t Au	NI 43-101 Rpt. 14/11/2011	Inactive	00915
Sir James Dunn Mine (past producer) <i>Chabanel</i>	Fe	65 454 545 t @ 34% Fe, 7% SiO ₂	RGF	Inactive	03064
Surluga Mine/ Citadel Mine (past producer) <i>McMurray</i>	Au	Inferred resource: 19 824 000 t @ 1.71 g/t Au (1 088 000 ounces @ 0.5 g/t cut-off)	NI 43-101 Rpt. 06/05/2015	Active exploration and diamond drilling 2018– 2024	00851

Note: This table contains tonnage and grade estimates referred to as reserves (indicated, possible, probable), which were determined at various times by methods largely unreported. Except where noted, none of these estimates are known to conform to the standards required for National Instrument 43-101 and should be considered inferred mineral resources not reserves.

*Jubilee–Surluga property is currently within the Wawa Gold project.

Unit abbreviations used: g = grams; lbs = pounds; oz = ounce(s); t = tonnes.

REGIONAL LAND USE GEOLOGIST ACTIVITIES—NORTHEAST REGION AND SOUTHERN REGIONS

The activities of the Regional Land Use Geologist are described *in* “Regional Land Use Geologist Activities—Northeast Region” in the Timmins District report of this volume.

In addition, the southern Regional Land Use Geologist co-ordinates input into land-use planning activities in part of the Sault Ste. Marie District (St. Joseph Island). No requests for input were received in 2024.

MINERAL INVENTORY GEOSCIENTIST ACTIVITIES—NORTHEASTERN AND SOUTHERN ONTARIO

The activities of the Mineral Inventory Geoscientist are described *in* “Mineral Inventory Geoscientist Activities—Northeastern and Southern Ontario” in the Timmins District report of this volume.

GEOGRAPHIC INFORMATION SYSTEM DATA SPECIALISTS ACTIVITIES—NORTHWESTERN AND NORTHEASTERN ONTARIO

The activities of the Geographic Information System Data Specialists are described *in* “Geographic Information System Data Specialists Activities—Northwestern and Northeastern Ontario” in the Timmins District report of this volume.

ACKNOWLEDGMENTS

Information on past activities reported in the text is from assessment files and other files of the Sault Ste. Marie District Geologist’s Office unless otherwise noted. Information on current mining and exploration activities was provided by individual prospectors and exploration and mining company personnel, compiled from assessment files and obtained from public information sources.

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
<i>SI Unit</i>	<i>Multiplied by</i>	<i>Gives</i>	<i>Imperial Unit</i>	<i>Multiplied by</i>	<i>Gives</i>
LENGTH					
1 mm	0.039 37	inches	1 inch	25.4	mm
1 cm	0.393 70	inches	1 inch	2.54	cm
1 m	3.280 84	feet	1 foot	0.304 8	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	1.609 344	km
AREA					
1 cm ²	0.155 0	square inches	1 square inch	6.451 6	cm ²
1 m ²	10.763 9	square feet	1 square foot	0.092 903 04	m ²
1 km ²	0.386 10	square miles	1 square mile	2.589 988	km ²
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
VOLUME					
1 cm ³	0.061 023	cubic inches	1 cubic inch	16.387 064	cm ³
1 m ³	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m ³
1 m ³	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m ³
CAPACITY					
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	4.546 090	L
MASS					
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	31.103 476 8	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	0.453 592 37	kg
1 kg	0.001 102 3	tons (short)	1 ton(short)	907.184 74	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	0.907 184 74	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	1016.046 908 8	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	1.016 046 9	t
CONCENTRATION					
1 g/t	0.029 166 6	ounce (troy) / ton (short)	1 ounce (troy) / ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights / ton (short)	1 pennyweight / ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	<i>Multiplied by</i>	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

*Note: Conversion factors in **bold** type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.*

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