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## **TROILUS GOLD CORP.**

# TECHNICAL REPORT ON THE TROILUS GOLD-COPPER PROJECT MINERAL RESOURCE ESTIMATE, QUEBEC, CANADA

NI 43-101 Report

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December 20, 2019

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## **1 SUMMARY**

### **EXECUTIVE SUMMARY**

Roscoe Postle Associates Inc. (RPA) was retained by Troilus Gold Corp. (Troilus) to prepare an independent Technical Report on the Troilus Gold-Copper Project (the Project), located in northwestern Quebec, Canada. The purpose of this Technical Report is to support updated open pit and underground Mineral Resource estimates for the Project. The Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). The Project is located approximately 650 km north of Montreal and 175 km by road north of Chibougamau in northwestern Quebec. RPA has visited the Project multiple times, with the most recent site visit on August 19, 2019.

Troilus is a Toronto-based, Quebec focused, advanced stage exploration and earlydevelopment company focused on the mineral expansion and potential mine re-start of the former Troilus Gold-Copper Project.

The Project was acquired in three separate transactions. The first consisted of the acquisition from First Quantum Minerals Ltd. (First Quantum) in April 2018 of 81 mineral claims and one surveyed mining lease that collectively covered approximately 4,700 ha and included the former Troilus Mine. The second transaction consisted of the acquisition from Emgold Mining Corporation (Emgold) of 209 mineral claims that covers approximately 11,300 ha in December 2018, whereby Troilus acquired the Troilus North property located immediately to the north and east of the Troilus property (Figure 4-2). The third transaction consisted of the acquisition from Sisted of the acquisition from O3 Mining Inc. (O3) of three mining claims that cover approximately 160 ha in November 2019.

The Troilus open pit operation produced gold, copper, and silver continuously from November 1996 to April 2009. The Troilus Mine produced over two million ounces of gold and almost 70,000 tonnes of copper. After the mine ceased production in 2009, the 20,000 tonnes per day (tpd) mill processed low grade stockpiles until June 29, 2010. In late 2010, the mill was sold and shipped to Mexico and the main camp facilities were dismantled. At present, a small number of personnel are based at the site 24 hours per day to oversee the on-going site



restoration, environmental monitoring, and exploration work. A new 50-person camp, core logging facility, and office were built in 2018.

For this Technical Report, RPA re-estimated Mineral Resources for Zone 87 (Z87) based on a combined open pit and underground mining scenario, while Mineral Resource estimates for J4 and J5 are based on an open pit mining scenario. The combined open pit and underground Mineral Resource estimate for the Project is summarized in Table 1-1. The effective date of the Mineral Resource estimate is October 31, 2019. Mineral Resources conform to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions).

# TABLE 1-1 MINERAL RESOURCE ESTIMATE AS OF OCTOBER 31, 2019 Troilus Gold Corp. – Troilus Gold-Copper Project

Classification	Tonnes (Mt)	Au (g/t)	Cu (%)	Ag (g/t)	AuEq (g/t)	Contained Gold (Moz)	Contained Copper (MIb)	Contained Silver (Moz)	Contained AuEq (Moz)
Indicated	159.1	0.78	0.09	1.19	0.92	3.97	301.2	6.07	4.71
Inferred	52.7	0.90	0.08	1.01	1.04	1.53	94.9	1.71	1.76

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.

 Open pit Mineral Resources were estimated at a cut-off grade of 0.3 g/t gold equivalent (AuEq) and were constrained by a Whittle pit shell. Underground Mineral Resources were estimated at a cut-off grade of 0.9 g/t AuEq.

 Mineral resources were estimated using long-term metal prices of US\$1,400 per ounce gold, US\$3.25 per pound copper, and US\$20 per ounce of silver; and an exchange rate of US\$1.00 = C\$1.25.

4. Z87 Zone gold equivalent was calculated with formula AuEq = Au grade + 1.546 \* Cu grade + 0.01 \* Ag grade, and the J Zone (J4-J5) gold equivalent was calculated with formula AuEq = Au grade + 1.47 \* Cu grade + 0.013 \* Ag grade.

5. A recovery of 83% for gold, 92% for copper, and 76% for silver was used at the Z87 Zone; a recovery of 82% for gold, 88% for copper, and 76% for silver was used at the J Zone (J4-J5).

RPA is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

#### CONCLUSIONS

There are significant underground and open pit resources remaining at Troilus. The mineralization gold grade and thicknesses are very continuous, and the mineralization is still open at depth.





Several advanced engineering studies were completed in 2005 and 2006 that investigated a number of underground development scenarios based on metal prices that were approximately one third of those used for this resource estimate. The various scenarios generated positive cash flows but required significant up-front capital expenditures, mostly for the extensive underground development that needed to be in place before stoping could begin.

All the underground studies in 2005 and 2006 were tailored to feeding the existing 20,000 tpd mill. Now that the mill has been removed, there is an opportunity to examine scenarios based on a smaller mill.

RPA concludes that a significant amount of technical work has been carried out by earlier operators and that more exploration and engineering work is warranted.

#### RECOMMENDATIONS

RPA recommends that Troilus continue to evaluate the technical and economic viability of the Project. RPA recommends that a Preliminary Economic Assessment (PEA), additional in-fill and step out drilling, and engineering studies be completed in 2020. RPA recommends a two phase program and budget approach for the above work, with Phase 2 contingent on positive results from Phase 1 (Tables 1-2 and 1-3).

Item	Total (C\$ 000)
Phase 1	
Exploration Drilling (20,000 m at \$200/m)	4,000
Environmental Work	100
PEA	300
Claims and Mining Lease Renewal Fees	100
Contingency	200
Total Phase 1	4,700

# TABLE 1-2 RECOMMENDED PROGRAM AND BUDGET - PHASE 1 Troilus Gold Corp. – Troilus Gold-Copper Project



#### TABLE 1-3 RECOMMENDED PROGRAM AND BUDGET – PHASE 2 Troilus Gold Corp. – Troilus Gold-Copper Project

Item	Total (C\$ 000)
Phase 2	
Exploration Drilling (10,000 m at \$200/m)	2,000
Geotechnical data and study	500
Metallurgical Study	300
Environmental Work	200
Prefeasibility Study	1,000
Contingency	500
Total Phase 2	4,500

RPA recommends the following work:

- Complete a PEA.
- Continue diamond drilling to potentially upgrade and expand the current resources.
- Carry out geotechnical studies.
- Carry out metallurgical studies.
- Carry out environmental studies.
- Assess the potential for new mineralized zones on the Troilus property that are outside the current areas with defined resources.
- Review the site environmental monitoring results and re-assess the site restoration plan schedule and cost.

### TECHNICAL SUMMARY

#### PROPERTY DESCRIPTION AND LOCATION

The Project is located approximately 650 km north of Montreal and 175 km by road north of Chibougamau in northwestern Quebec within lands administered by the Municipalité de la Baie James. The Project is approximately centred on UTM coordinates 535,085 mE and 5,649,950 mN (NAD 83, Zone 18), or latitude 51°00' N and longitude 74°30' W.

The Troilus property consists of one surveyed mining lease (BM 829) covering 840 ha and 81 map designated claims covering 3,878.6 ha, for a total of 4,718.6 ha. The Troilus North property comprises 209 map designated claims covering 11,308.76 ha. The Troilus North O3 property comprises three map designated claims covering 162.38 ha. Overall, the Project consists of one mining lease and 293 map designated claims covering 16,189.74 ha.



The Troilus Mine is a past producer. Two open pits, J4 and Z87, operated from 1996 to 2009. Site restoration work began in 2007 and is almost complete. Environmental monitoring work is on-going and will continue for approximately five years after the site restoration work has been completed.

RPA is not aware of any significant environmental liabilities on the property but recommends that Troilus retain an environmental expert to review the site closure status and monitoring results. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

#### EXISTING INFRASTRUCTURE

Most of the infrastructure on the mine site has been sold and removed. The key current infrastructure includes:

- New 50-person camp
- Office building
- Core logging facility
- Outdoor core storage area
- Garage for snow removal and road maintenance contractor
- Garage for site restoration employees
- Electrical transformer station
- Drinking water tank and pump house
- Tailings water treatment plant
- A number of tailings water pump houses
- Gatehouse and gate

When the original Troilus Mine was in operation bus transportation was provided for the workforce several times per week to and from Chibougamau and Mistissini.

#### HISTORY

Initial exploration in the area started in 1958 following the discovery of many erratic boulders containing copper and nickel anomalies. As a result, some occurrences of copper and zinc were discovered, including Falconbridge Ltd.'s massive sulphide deposit at Baie Moléon and Selco Mining Corp.'s Lessard deposit near Lac Domergue.



Kerr Addison Mines Ltd. (Kerr Addison) staked two large blocks of claims in 1985 and 1987 that included the Troilus Mine area. Kerr Addison carried out geochemical, geophysical, and geological work followed by drilling, which led to the discovery of Zone 86 in 1986. In 1988, Minnova Inc. (Minnova) became exploration operator in a 50-50 joint-venture with Kerr Addison.

Between 1989 and 2005, fourteen drilling programs comprising 887 diamond drill holes for a total of 159,538 m were carried out on the property. The drilling outlined five main areas of gold mineralization (Z87/87S, Z87 Deep, J4, J5, and Southwest) and a number of isolated gold intersections.

In February 1993, Metall Mining Corporation (Metall) acquired Minnova's interest and, in May 1993, purchased all of Kerr Addison's mining property interests. In August 1993, a positive feasibility study was completed based on a 10,000 tpd open pit operation. In May 1995, Metall changed its name to Inmet Mining Corporation (Inmet). The mine started commercial production in October 1996 and operated continuously up to April 2009 and the mill continued to process stockpile material up to June 29, 2010. The Troilus Mine produced over two million ounces of gold and almost 70,000 tonnes of copper.

#### **GEOLOGY AND MINERALIZATION**

The Project is located within the eastern segment of the Archean Frotet-Evans Greenstone Belt, in the Opatica Subprovince of the Superior Province in Quebec. The belt extends for more than 300 km between James Bay and Mistassini Lake, and varies from a few kilometres up to 45 km in width. The belt is divided into two similar volcano-sedimentary domains, west domain, and east domain. The east domain is known as the Frotet-Troilus Domain and hosts the Troilus deposit.

The Frotet-Troilus Domain is underlain by a supracrustal sequence of submarine mafic volcanic rocks with intercalated cogenetic mafic intrusions. The rocks are variably deformed and are affected by a strong regional foliation. Subhorizontal mesoscopic to megascopic folds are common, affecting both regional foliation and primary layering. The metamorphic grade in the North Troilus area ranges from greenschist to lower amphibolite facies, the higher grades appearing around the borders of certain intrusions and towards the margins of the greenstone belt.



The property geology consists of a sequence of intermediate to mafic flows and breccia, locally with felsic volcanic rocks, and co-magmatic gabbro and ultramafic sills. The gold mineralization at Troilus is hosted in a multiphase gabbro to diorite intrusion, the Troilus Diorite. The Troilus Diorite hosts the two main mineralized zones (Z87 and J4) of the Project in its northeast and north margins.

Two styles of mineralization, disseminated and vein-hosted, are recognized at Troilus. Disseminated mineralization contributed greater than 90% of the ore, particularly in Z87. This mineralization style consists of disseminated fine grained chalcopyrite, pyrite, and pyrrhotite and streaks and stringers of these minerals along the foliation and fractures. Copper values are consistently greater than 0.07% Cu. Gold occurs as native gold and electrum grains up to 20 µm in size with up to 15% Ag.

Several generations of gold bearing veins have been identified, the most significant being quartz-chlorite (±tourmaline) veins. These veins occur in silicified wall rocks to sericitized high strain zones which cut the main foliation and in the margins of felsic dikes. Although volumetrically much less significant than the main disseminated mineralization, the veinlets can contain grades of greater than 50 g/t Au over a one metre interval.

#### **EXPLORATION STATUS**

In 2018 and 2019, Troilus investigated the potential to extend the known gold mineralization in zones J4 and J5 further to the north and at depth. As gold mineralization is still present in the northernmost 2018 and 2019 boreholes, the potential for a continuation of both zones to the north is open. Because of the higher deformation intensity to the north, gold mineralization is likely to be affected by a stronger transposition relative to that at Z87, J4, and J5.

#### MINERAL RESOURCES

RPA estimated Mineral Resources for the Project and reported underground resources at a cut-off grade of 0.9 g/t AuEq and open pit resources at a cut-off grade of 0.3 g/t AuEq. The open pit resources are located at Z87, J4, and J5 zones and are constrained by a Whittle pit shell. The underground resources are located at Z87. The Mineral Resource estimate is summarized in Table 1-1.



The estimate is prepared using a Geovia GEMS version 6.8.1 block model with blocks measuring 5 m by 5 m by 5 m in size. The Mineral Resources are estimated using three dimensional (3D) mineralized wireframes. A resource pit shell was used to assist in reporting of the open pit resources. The underground resources are reported below the resource pit shell for Z87 at a higher cut-off grade, from mineralized areas with contiguous blocks above the underground cut-off grade

The Mineral Resource estimate has an effective date of October 31, 2019. RPA estimates combined underground and open pit Indicated Mineral Resources to total 159.1 million tonnes (Mt) grading 0.78 g/t Au, 0.09% Cu, and 1.19 g/t Ag containing 3.97 million ounces (Moz) of gold, 301.2 million pounds (Mlb) of copper, and 6.07 Moz of silver. In addition, combined underground and open pit Inferred Mineral Resources are estimated to be 52.7 Mt grading 0.90 g/t Au, 0.08% Cu, and 1.01 g/t Ag containing 1.53 Moz of gold, 94.9 Mlb of copper, and 1.71 Moz of silver.

RPA estimates the open pit Indicated Mineral Resources to total 140.8 Mt grading 0.67 g/t Au, 0.08% Cu, and 1.19 g/t Ag containing 3.02 Moz of gold, 242.7 Mlb of copper, and 5.39 Moz of silver. In addition, open pit Inferred Mineral Resources were estimated to be 36.2 Mt grading 0.56 g/t Au, 0.06% Cu, and 1.17 g/t Ag containing 0.66 Moz of gold, 51.3 Mlb of copper, and 1.36 Moz of silver.

RPA estimates the underground Indicated Mineral Resources total 18.3 Mt grading 1.62 g/t Au, 0.15% Cu, and 1.16 g/t Ag containing 0.95 Moz of gold, 58.5 Mlb of copper, and 0.68 Moz of silver. In addition, underground Inferred Mineral Resources were estimated to be 16.6 Mt grading 1.63 g/t Au, 0.12% Cu, and 0.67 g/t Ag containing 0.87 Moz of gold, 43.6 Mlb of copper, and 0.36 Moz of silver.

RPA is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.



## **2 INTRODUCTION**

Roscoe Postle Associates Inc. (RPA) was retained by Troilus Gold Corp. (Troilus) to prepare an independent Technical Report on the Troilus Gold-Copper Project (the Project), located in northwestern Quebec, Canada. The purpose of this Technical Report is to support an updated open pit and underground Mineral Resource estimates for the Project. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). The Project is located approximately 650 km north of Montreal and 175 km by road north of Chibougamau in northwestern Quebec.

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RPA has been involved with the Project since 2002. In August 2002, RPA provided Inmet with technical assistance regarding new block models and updated Mineral Resource estimates for Zone 87 (Z87) and the Zone J4 (J4). In addition to resource work conducted by Luke Evans M.Sc., P.Eng., RPA Executive Vice President, Geology and Mineral Resources, worked with Inmet personnel at the Troilus Mine from August 13 to 15 and September 25 to October 1, 2002, and from January 20 to 30, February 10 to 20, March 18 to 27, 2003.

RPA and Inmet co-authored a NI 43-101 Technical Report dated April 24, 2004, on the January 1, 2004 Troilus Mine Mineral Resource and Mineral Reserve estimates (Balint et al., 2003). The Mineral Reserve reported in Balint et al. (2003) incorporated pit expansions to the Z87 and J4 pit designs that represented significant increases over previous estimates. In addition, RPA authored a NI 43-101 Technical Report dated April 28, 2006, on the December 2005 Z87 underground Mineral Resource estimate (RPA, 2006).

More recently, RPA authored the following four NI 43-101 Technical Reports with open pit and underground Mineral Resource estimates for the Project:

- A Technical Report dated June 30, 2014 for Copper One Inc. that prioritized open pit resources at Z87 (RPA, 2014).
- A Technical Report dated June 30, 2016 for Sulliden Mining Capital Inc. that prioritized underground resources at Z87 (RPA, 2016).
- A re-addressed Technical Report dated November 20, 2017 for Pitchblack Resources Ltd. that includes the RPA, 2016 resource estimates (RPA, 2017).
- A Technical Report dated January 1, 2019 for Troilus Gold Corp. that supported updated open pit and underground Mineral Resource estimates for the mine (RPA, 2019).

The current resource drill hole database contains 805 drill holes totalling 199,225.7 m and most of the drill holes targeted Z87 and J4. This includes 90 holes totalling 37,018 m from 2018 and 80 holes totalling 35,217 m from 2019.

#### SOURCES OF INFORMATION

A site visit was carried out by Mr. Evans on July 19, 2018 and August 19, 2019. Mr. Evans visited the temporary office, core logging, and storage facility in Chibougamau in 2018 and the new office, core logging facility, and 50 person camp at the Project site in 2019. A number of recent drilling sites and one of Forages Chibougamau Ltée's drills were examined during the 2018 site visit, additionally several exploration outcrops were visited by helicopter in 2019.



Discussions were held with personnel from Troilus including:

- Ian Pritchard, Senior Vice President Technical Services
- Blake Hylands, Senior Vice President Exploration
- Bertrand Brassard, Senior Project Geologist
- Thiago Diniz, Exploration Geologist
- Jean Bernard, Exploration Geologist
- Thiago Bonas, Resource Geologist
- Yannick D'Amboise, Lead Technician

This Technical Report was prepared by Mr. Evans, who accepts responsibility for all sections of this report. The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.



#### LIST OF ABBREVIATIONS

Units of measurement used in this Technical Report conform to the metric system. All currency

in this Technical Report is in Canadian dollars (C\$) unless otherwise noted.

2	annum	kWh	kilowatt-hour
a A	ampere	L	litre
bbl	barrels	lb	pound
btu	British thermal units	L/s	litres per second
°C	degree Celsius	m	metre
C\$	Canadian dollars	M	mega (million); molar
cal	calorie	m <sup>2</sup>	square metre
cfm	cubic feet per minute	m <sup>3</sup>	cubic metre
cm	centimetre		micron
cm <sup>2</sup>	square centimetre	μ MASL	metres above sea level
d	day		microgram
dia	-	μg m³/h	-
	diameter		cubic metres per hour
dmt dwt	dry metric tonne	mi	mile
°F	dead-weight ton	min	minute
	degree Fahrenheit	μm	micrometre
ft	foot	mm	millimetre
ft <sup>2</sup>	square foot	mph	miles per hour
ft <sup>3</sup>	cubic foot	MVA	megavolt-amperes
ft/s	foot per second	MW	megawatt
g G	gram	MWh	megawatt-hour
	giga (billion)	OZ	Troy ounce (31.1035g)
Gal	Imperial gallon	oz/st, opt	ounce per short ton
g/L	gram per litre	ppb	part per billion
Gpm	Imperial gallons per minute	ppm	part per million
g/t	gram per tonne	psia	pound per square inch absolute
gr/ft <sup>3</sup>	grain per cubic foot	psig	pound per square inch gauge
gr/m <sup>3</sup>	grain per cubic metre	RL	relative elevation
ha	hectare	s st	second
hp	horsepower		short ton
hr Hz	hour	stpa	short ton per year
in.	hertz inch	stpd t	short ton per day
in <sup>2</sup>	square inch	tpa	metric tonne
J	joule	•	metric tonne per year
s k	kilo (thousand)	tpd US\$	metric tonne per day United States dollar
kcal	kilocalorie	USg	United States gallon
	kilogram	USgpm	US gallon per minute
kg km	kilometre	V	volt
km <sup>2</sup>	square kilometre	Ŵ	watt
km/h	kilometre per hour	wmt	wet metric tonne
kPa	kilopascal	with wt%	weight percent
kVA	kilovolt-amperes	yd <sup>3</sup>	cubic yard
kW	kilovoit-amperes	-	•
r v v	NIUWall	yr	year



## **3 RELIANCE ON OTHER EXPERTS**

This Technical Report has been prepared by RPA for Troilus. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this Technical Report, and
- Assumptions, conditions, and qualifications as set forth in this Technical Report.

For the purpose of this Technical Report, RPA has relied on ownership information provided by Troilus. RPA has not researched property title or mineral rights for the Project and expresses no opinion as to the ownership status of the property.

Except for the purposes legislated under provincial securities laws, any use of this Technical Report by any third party is at that party's sole risk.



## **4 PROPERTY DESCRIPTION AND LOCATION**

The Project is located approximately 650 km north of Montreal and 175 km by road north of Chibougamau in northwestern Quebec within lands administered by the Municipalité de la Baie James (Figure 4-1). The Project is located within NTS map sheets 32J/15 (Lac Troilus), 32J/16 (Lac Bueil), 32O/01 (Lac Miskittenau), and 32O/02 (Lac Montmort). It is approximately centred on UTM coordinates 535,085 mE and 5,649,950 mN (NAD 83, Zone 18), or latitude 51°00' N and longitude 74°30' W.

The Project is a past producer. Two open pits, J4 and Z87, operated from 1996 to 2009. Site restoration work began in 2007 and is mostly complete. Environmental monitoring work is on-going.

### LAND TENURE

The Project was acquired through three separate transactions. The first consisted of the acquisition of 81 mineral claims and one surveyed mining lease (BM 829), which collectively covered approximately 4,700 ha and included the former Troilus Mine from First Quantum in April 2018 (Figure 4-2 and 4-3). The mining lease and all subject claims are listed in Table 30-1 in Appendix 1, in addition to their designated number, recording date, area, fees, and biannual work requirements. The second transaction consisted of the acquisition of 209 mineral claims, covering approximately 11,300 ha from Emgold in December 2018, whereby Troilus acquired the Troilus North property located immediately to the north and east of the Troilus property (Figure 4-2, Figure 4-4, and Table 30-2). The third transaction consisted of the acquisition of three mining claims, covering approximately 160 ha from O3 Mining Inc. ("O3") in November 2019 (Figure 4-4 and Table 30-3). The Project consists of one mining lease and 293 map designated claims covering 16,189.74 ha.



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There are sufficient exploration work credits at both the Troilus property and the Troilus North property to satisfy the assessment work requirements for the next two years. Renewal fees totaling approximately \$54,000 will be due in March 2020 for the mining lease and approximately \$5,000 will be due in February 2021 for the map designated claims for the Troilus property. Renewal fees totaling approximately \$14,000 for the Troilus North property and approximately \$200 for the three Troilus North O3 claims will be due in 2021.

Map designated claims have pre-established positions and a legal survey of them is not required. All claims are in good standing.

In Quebec, a mining lease is initially granted for a 20 year period. The mining lease can be renewed for additional ten year periods. Mining lease BM 829 is in good standing, with an expiry date of March 3, 2026.

A map designated claim is valid for two years and can be renewed indefinitely, subject to the completion of necessary expenditure requirements. The map designated claims in the Troilus and Troilus North properties have an average individual size of approximately 54 ha. Each claim gives the holder the exclusive right to explore for mineral substances, except sand, gravel, clay, and other unconsolidated deposits, on the land subject to the claim. The claim also guarantees the holder's right to obtain an extraction right upon the discovery of a mineral deposit. Ownership of the mining rights confers the right to acquire the surface rights.

In addition to the surface rights covering the mining lease, there are surface right leases covering a number of areas with roads and infrastructure. The surface rights renewal fee totals more than \$50,000 per year.

On May 2, 2016, a wholly-owned subsidiary of Sulliden Sub entered into the Agreement with First Quantum to purchase a 100% interest in the Project, subject to a sliding scale NSR royalty. First Quantum had acquired the Troilus Mine as part of the Inmet takeover in March 2013.

To exercise the option under the Agreement, three cash payments of \$100,000 were made to First Quantum and over \$1,000,000 was spent by Troilus and its predecessors on engineering and technical studies to evaluate the economic viability of the Project. In addition, Troilus agreed to take on the existing liabilities of the Project.



On October 31, 2017, Pitchblack, Sulliden Sub, and 251 Ontario entered into an amalgamation agreement. The amalgamation agreement closed on December 20, 2017 and Pitchblack was renamed Troilus.

Pursuant to the amalgamation agreement, Sulliden Sub, 251 Ontario, and a Pitchblack wholly owned subsidiary were amalgamated to form one wholly-owned subsidiary of Pitchblack. Every four existing Pitchblack shares were consolidated into one new common share of Troilus.

On April 12, 2018, Troilus formally exercised its option to acquire the Troilus property from First Quantum and title was transferred to Troilus. The 81 claims previously owned by First Quantum are subject to a variable NSR to First Quantum of 1.5% or 2.5% depending on whether the price of gold is above or below US\$1,250 per ounce. In addition, QuestCap Inc. has an additional 1% royalty, acquired from an arm's length private company in October 2019.

On December 5, 2018, Troilus announced that it had completed the acquisition of the Troilus North Project from Emgold. As consideration for the acquisition, Troilus issued Emgold 3,750,000 common shares and paid Emgold \$250,000 in cash. The shares were subject to a four-month statutory hold period. Until December 5, 2020, Troilus has a ROFR whereby Troilus has the opportunity to find a buyer at equal or superior terms in the event Emgold wishes to dispose of the shares. During the ROFR period, provided Emgold holds no less than 5% of Troilus' issued and outstanding shares, Emgold shall have the right to participate in transactions involving the issuance of equity securities of Troilus, in order to maintain its proportional interest in Troilus, subject to certain conditions.

The 209 claims acquired from Emgold Mining (formerly known as the Troilus North project) are subject to the following underlying royalties:

- a 1% NSR to Chimata Gold Corporation that Troilus has the right to purchase for \$1,000,000; and
- a 1.5% NSR to three individuals that Troilus has the right to purchase for \$2,000,000 until 24 months from the start of commercial production and for \$3,000,000 thereafter.

On November 11, 2019, Troilus announced that it had completed the acquisition of three claims from O3 Mining Inc. The three claims fall within the boundaries of the Troilus North property and are named the Troilus North O3 property. As consideration for the acquisition of these three claims, Troilus has issued 300,000 common shares and granted a 2% NSR to O3



Mining Inc. on these three claims. Troilus will have the right to repurchase 1% of the NSR at any time for \$1,000,000. In addition, the three claims acquired from O3 Mining Inc. are subject to a 2% NSR to an individual, half of which can be purchased for \$1,000,000.

### MINE RESTORATION PLAN

The site restoration work begun in 2007 by Inmet with the re-vegetation of areas no longer used by Troilus (Figures 4-5 to 4-7). The dismantling, cleaning, and grading work has largely been completed. Fertilization and seeding work is on-going, particularly in the tailings area. A water treatment plant has been functional since the end of 1998, after initial operation revealed suspended solid control problems. It uses a new technology (ACTIFLO) based on polymer addition and agitation followed by high speed sand assisted lamellar decantation and reduces suspended solids to concentrations below 15 ppm, the monthly average regulation limit. The length of time the water treatment plant will be required for is unclear.

The first version of the mine restoration plan was filed with the Ministère des Ressources Naturelles et de la Faune (MRNF) in 1996, followed by a first revision in 2002 and a second revision five years later in 2007. The current mine restoration plan was produced by Genivar Inc. (Genivar) in November 2009 (Genivar, 2009). This restoration plan took into consideration the previous versions, however, was a completely new plan including the recent additional studies updating the information regarding the hydrology and hydrogeology, the acid rock drainage, the Phase 1-type site characterization, and the progressive restoration work carried out in 2007, 2008, and 2009. The Cree Nation of Mistissini (the Mistissini Cree) community was consulted throughout the process. The closure plan for the Troilus Mine was approved by the Quebec Ministry of Sustainable Development, Environment and Parks (Certificate of Authorization No. 3214-14-025) pursuant to modifications made November 3, 2010 and May 23, 2012.



# FIGURE 4-5 2018 TROILUS DRONE VIEW LOOKING NORTHWEST AT Z87 AND J4 PITS AND WASTE DUMPS



FIGURE 4-6 2018 TROILUS DRONE VIEW LOOKING SOUTH AT Z87 PIT





#### FIGURE 4-7 2018 TROILUS DRONE VIEW LOOKING NORTH AT J4 PIT



FIGURE 4-8 2019 VIEW FROM HELICOPTER LOOKING NORTHWEST AT J4 PIT



Surface and groundwater water samples are taken at regular intervals at a number of monitoring sites on the property and annual reports summarizing the results are submitted to the MRNF and the Ministère de l'Environnement et de la Faune (MDDEP). RPA understands that the monitoring work will continue for at least five years after the site restoration work is completed.

Genivar (2009) estimated that the site restoration work would be completed in 2012 and that the post-restoration monitoring program would continue until 2016. RPA notes that the site restoration work is taking longer than expected and recommends that Troilus re-assess the timing and costs related to site restoration and monitoring.



RPA is not aware of any significant environmental liabilities on the property but recommends that Troilus retain an environmental expert to review the site closure status and monitoring results. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

### PERMITTING

Other than a permit for tree cutting pertaining to the installation of drill roads and drill setups, no permits are required to conduct exploration on the property. The permit for tree cutting is issued by the MRNFP-Forestry sector. This permit can generally be obtained quickly.

Troilus will apply for all required permits prior to conducting the proposed work on the property. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the Project.



## 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

### ACCESSIBILITY

The Project is located within the Municipalité de la Baie James in northwestern Quebec. It can be accessed via road from Chibougamau by driving 23 km east along Hwy 167, 108 km north along Route du Nord, and 44 km northeasterly along the mine access road. All of these roads are well maintained year-round. Chibougamau is serviced by daily flights from Montreal.

### CLIMATE

The regional climate is characterized by short mild summers and long cold winters, with mean temperatures ranging from –17°C in January to 16°C in July. Mean annual precipitation ranges from 40 mm in February to 120 mm in September. Exploration and mining activities may be carried out year-round.

### LOCAL RESOURCES

Various limited services are available at Mistissini, a Cree community located approximately 90 km southeast of the mine. In June 2018, Troilus opened an office at Mistissini. The new office will provide a forum for exchanging information and liaising with the Cree on a variety of social, environmental, and economic aspects of the Project, in addition to the potential for future training, employment, and business opportunities. The office will also provide information about gold exploration and gold mining in general.

A greater range of industry services is available at Chibougamau, a mining town with a population of approximately 8,500 established in 1950 and located approximately two hours via road to the south. It has a well-developed local infrastructure, services, and a mining industry workforce.

The mine is connected to the provincial hydroelectric grid via a 137 km 161 kV power line. Water is plentiful.



Politically, the province is very supportive of mining. The Quebec government has demonstrated a will to encourage the development of natural resources through expeditious permitting, title security, and financial incentives.

### INFRASTRUCTURE

The Troilus Mine was a conventional open pit that operated on a continuous, year-round basis. The mill had a nominal capacity of 20,000 tpd with a flow sheet consisting of a gravimetric and flotation circuit. The mill was sold and shipped to Mexico following mine closure. There was a permanent on-site camp with dining, sleeping, and recreational facilities for up to 450 workers, which has since been dismantled. Security personnel patrol the site on a regular basis. Most of the infrastructure on the mine site has been sold and removed. The key current infrastructure includes:

- New 50-person camp
- Office building
- Core logging facility
- Outdoor core storage area
- Garage for snow removal and road maintenance contractor
- Garage for site restoration employees
- Electrical transformer station
- Drinking water tank and pump house
- Tailings water treatment plant
- A number of tailings water pump houses
- Gatehouse and gate

When the former Troilus Mine was in operation bus transportation was provided for the workforce several times per week to and from Chibougamau and Mistissini.

In addition to the surface rights covering the mining lease, there are surface right leases covering a number of areas with roads and infrastructure. Although the extent of the surface rights was sufficient to operate the mine in the past, additional surface rights may be required in areas with newly estimated Mineral Resources. The location of the site infrastructure including open pits, waste and ore stockpiles, tailings area, former mill site, office, and other buildings, as well as other significant features, are shown in Figure 5-1.



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The water levels in the Z87 pit as of June 2014, June 2016, and July 2018 are shown in Figures 5-2 to 5-4 and in the water levels in the J4 pit as of June 2014 and June 2016 in Figures 5-5 and 5-6.



#### FIGURE 5-2 Z87 PIT LOOKING WEST AS OF JUNE 2014

FIGURE 5-3 Z87 PIT LOOKING WEST AS OF JUNE 2016



Source: Stéphane Amireault June 2016



FIGURE 5-4 Z87 PIT LOOKING WEST AS OF JULY 2018



FIGURE 5-5 J4 PIT LOOKING SOUTHWEST AS OF JUNE 2014



FIGURE 5-6 J4 PIT LOOKING SOUTHWEST AS OF JUNE 2016



Source: Stéphane Amireault June 2016


# PHYSIOGRAPHY

The Project area is primarily covered by black spruce forests, swamps, and lakes. The vertical relief in the area is moderate, with a mean altitude of 375 m above sea level (MASL). Overburden consists of a thick layer (>10 m) of fluvio-glacial till. Outcrops are sparse, and very large boulders sitting on surface are common.



# **6 HISTORY**

# **PRIOR OWNERSHIP**

Kerr Addison Mines Ltd. (Kerr Addison) staked two large blocks of claims in 1985 and 1987 that included the Project area. In 1988, Minnova Inc. (Minnova) became operator in a 50-50 joint-venture with Kerr Addison. In February 1993, Metall Mining Corporation (Metall) acquired Minnova's interest and, in May 1993, Metall purchased all of Kerr Addison's mining properties. On May 4, 1995, Metall changed its name to Inmet. Inmet was acquired by First Quantum in March 2013. On April 8, 2014, Copper One entered into a definitive purchase agreement with FQM (Akubra) Inc., a wholly-owned subsidiary of First Quantum, to acquire a 100% interest in the past producing Troilus Mine, however, the purchase was not completed.

# **EXPLORATION AND DEVELOPMENT HISTORY**

Initial exploration in the area began in 1958 following the discovery of many erratic blocks containing copper and nickel anomalies. Some occurrences of copper and zinc were discovered between 1958 and 1967, including a massive sulphide deposit at Baie Moléon discovered by Falconbridge Ltd. in 1961.

In 1971, the Lessard deposit was discovered by Selco Mining Corp. near Lac Domergue. It was geologically similar to Baie Moléon, consisting of massive sulphides. Following this discovery, an electromagnetic (EM) and magnetic geophysical survey was carried out over the Troilus and Frotet Lake area; however, this survey did not lead to any new significant discoveries.

The Baie Moléon and Lessard discoveries, located southwest of the Troilus deposit, improved the geological understanding of the Frotet-Evans greenstone belt, and opened the area to further exploration for base metal deposits.

In 1983, the results of a new airborne INPUT survey carried out over a large area of the eastern portion of the Frotet-Evans belt were published by the Government of Quebec. Some exploration work was conducted following this survey, however, no important discoveries were made.



Kerr Addison acquired a large block of claims in 1985, following a geological mapping program by the Quebec Ministry of Natural Resources that indicated good potential for gold and base metal mineralization. More geochemical, geophysical, and geological work was carried out by Kerr Addison in 1985 and 1986. Drilling began in 1986 with 24 holes totalling 3,590 m, which led to the discovery of Zone 86 (Z86).

In 1987, more claims were added to the property to the north of the Z86 drilling, where the former Troilus Mine is currently located. A large gold float dispersion train was found by prospecting and 26 diamond drill holes totalling 4,413 m were completed. Hole KN-12, collared immediately up-ice from a glacial float dispersion train, intersected significant gold-copper mineralization over great widths, which turned out to be part of Z87, named after the year of its discovery.

In 1988, 27 diamond drill holes totalling 6,567 m were completed. Initial drill testing of a nearby weak horizontal loop electromagnetic (HEM) anomaly intersected anomalous gold-copper mineralization in what was later confirmed to be J4 in 1991. The J4 name originates from its location on the "J" exploration grid. On October 1, 1988, a 50-50 joint-venture was formed between Kerr Addison and Minnova. Minnova became operator.

Between 1989 and 2005, fourteen drilling programs comprising 887 diamond drill holes for a total of 159,538 m were carried out on the property. The drilling outlined five main areas of gold mineralization (Z87/Zone 87 South (Z87S), Z87 Deep, J4, J5, and Southwest), and a number of isolated gold intersections.

In 1991, a semi-permanent camp, which could accommodate 30 to 50 people, was set up between Z87 and J4. During 1991, a bulk sample of approximately 200 tonnes averaging 2.3 g/t Au was taken from the centre of Z87 and approximately 100 tonnes were treated at the pilot plant of the Centre de Recherche Minérale du Québec in Quebec City as part of a pre-feasibility study. The remaining 100 tonnes were treated at the pilot plant of SGS Lakefield Research Limited (Lakefield) as part of the 1993 feasibility study.

In 1992, an orientation Induced Polarization Survey (IP) carried out over Z87 and J4 produced strong IP anomalies. The IP survey covered the entire property and was also useful in planning of a condemnation drilling program in areas where the infrastructure and stockpiles were planned.



Between December 1992 and March 1993, a drilling program comprising 181 holes totalling 24,239 m was carried out to complete the feasibility study. The purpose of the drilling was to define Z87 and J4 as well as to test other IP anomalies.

In February 1993, Metall acquired Minnova's interest and, in May 1993, purchased all of Kerr Addison's mining property interests. In August 1993, a positive feasibility study was completed based on a 10,000 tpd open pit operation (Kilborn, 1993). In September 1993, the Coopers & Lybrand Consulting Group from Toronto, Ontario, audited the feasibility study and found no significant problems.

From August 1994 to April 1995, Mineral Resources Development Inc. (MRDI) from San Mateo, California, reviewed the reserves of both the feasibility and post-feasibility studies for financing purposes. Other kriging parameters were tested, and a check assay program was carried out on the 1992 to 1993 data set.

In May 1995, Metall changed its name to Inmet. Financing of the project was completed in June 1995. Later that year, the refurbishing of the 44 km access road from the Route du Nord and a 137 km power line and two substations were completed.

The construction of the mill complex and all facilities was completed in the fall of 1996, and milling started in November 1996. In April 1997, after some fine tuning, the mill capacity reached 10,000 tpd.

In April 1998, Inmet approved a 15,000 tpd mill expansion feasibility study by Met-Chem Canada Inc. (Met-Chem). Modifications to the mill started in December 1998, and the full 15,000 tpd capacity was achieved in 1999.

New sampling and assay protocols for the blastholes and future diamond drilling campaigns were proposed by Francis Pitard in January 1999 (Pitard, 1999). As a result, significant modifications to the Troilus assay laboratory were completed during the fall of 1999 and it became fully operational in May 2000, after a six month implementation and adjustment period.

In 2004, Inmet approved another mill expansion feasibility study by Met-Chem to increase mill capacity to 20,000 tpd. Modifications to the mill were completed in December 2004 and the



full 20,000 tpd capacity was reached in 2005. In 2010, the mine was shut down as Inmet's direction shifted to other assets.

The major historical milestones are summarized in Table 6-1.

# TABLE 6-1MAJOR HISTORICAL MILESTONESTroilus Gold Corp. – Troilus Gold-Copper Project

Date	Description of Major Milestones
1985	Kerr Addison stakes over 1,500 claims in the Troilus area.
1987	Kerr Addison stakes Troilus Mine area and discovers gold and copper.
1988	Minnova options 50% interest from Kerr Addison and becomes operator.
December 1991	Kilborn Inc. Pre-Feasibility Study is negative (7,500 tpd).
February to May 1993	Metall acquires 100% interest in Troilus.
August 1993	Kilborn-Met-Chem-Pellemon Feasibility Study is positive (10,000 tpd).
September 1994	Metallgesellschaft AG sold its entire 50.1% interest in Metall Mining Corporation through the public sale of its shares.
Late 1994	Construction commenced.
May 4, 1995	Metall changed its name to Inmet.
1995	44 km access road from Route du Nord and a 137 km power line and two substations were completed.
October 1996	Construction completed.
November 1996	Production starts.
April 1997	Mill achieves 10,000 tpd.
April 1998	Met-Chem 15,000 tpd mill expansion Feasibility accepted.
1999	Mill achieves 15,000 tpd.
2002	Mill achieves 16,000 tpd.
2004	Met-Chem 20,000 tpd mill expansion Feasibility accepted.
2005	Mill achieves 20,000 tpd.
2007	Underground ramp stopped at 519.1 m from portal on January 22, 2007.
2008	Mining at J4 Pit completed in May 2008.
2008	Dumping waste backfill at south end of J4 pit begins in April 2008.
2009	Mining at Z87 Pit completed, last truck load on April 13, 2009.
2010	Mill stopped on June 29, 2010.
2010	Mill sold in September 2010.
2010	Camp sold on November 19, 2010 and subsequently dismantled.



# PAST PRODUCTION

The mine started commercial production in October 1996 and operated continuously up to April 2009 and the mill continued to process stockpile material up to June 29, 2010. From 1995 to 2010, approximately 69.6 million tonnes (Mt) averaging 1.00 g/t Au and 0.10% Cu of ore was mined and 7.6 Mt of lower grade mineralization had been stockpiled. A total of approximately 230.4 Mt had been excavated including 18.4 Mt of overburden and 134.7 Mt of waste rock. The overall mill recovery averaged 83% for gold and 89% for copper. The Troilus Mine produced over two million ounces of gold and almost 70,000 tonnes of copper. The production history up to the end of the mine life in 2010 is summarized in Table 6-2. The mill processed the low grade stockpile material from 2009 up until June 29, 2010.

# TABLE 6-2 HISTORICAL PRODUCTION Troilus Gold Corp. – Troilus Gold-Copper Mine

Description	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	1995 to 2010
Overburden (000 t)	3,449	5,080	3,235	967	1,949	552	63	203	843	1,702	347	0	0	0	0	0	18,389
Waste Rock (000 t)		988	8,840	13,052	12,073	14,370	13,441	14,912	11,279	10,344	11,452	9,787	6,951	6,999	212	0	134,700
Stockpile (000 t)		118	865	1,423	1,144	61	1,081	8	261	468	888	371	167	784	0	0	7,640
Ore Mined (000 t) Total Excavated		629	3,798	4,176	4,959	4,913	5,901	5,943	5,923	6,045	6,929	6,670	6,463	5,599	1,692	0	69,639
(000 t)	3,449	6,814	16,737	19,618	20,126	19,895	20,485	21,065	18,307	18,559	19,616	16,828	13,582	13,382	1,904	0	230,368
Mill Head (g/t Au)		1.35	1.44	1.34	1.26	0.9	1.1	1.08	1.03	0.95	0.94	0.86	0.87	0.95	0.83	0.52	1.00
Mill Head (%Cu)		0.157	0.163	0.138	0.125	0.104	0.156	0.132	0.108	0.092	0.076	0.051	0.054	0.106	0.11	0.08	0.10
Gold Recovery		80.7	85.56	86.43	85.64	82.78	83.6	83.05	83.01	80.63	81.79	82.45	81.72	84.02	84.00	81.00	83.09
Copper Recovery		81.4	89.41	89.71	89.81	89.87	91.75	90.22	89.42	86.78	89.68	86.9	87.63	93.39	92.00	89.00	89.13
Au (oz)*		12,941	139,888	146,970	168,364	122,532	162,578	164,602	164,061	149,028	159,545	147,876	138,391	151,297	135,200	37,900	2,001,173
Cu (t)*		471	5,158	4,915	5,416	4,786	7,836	6,817	5,791	4,814	4,444	2,881	2,772	5,707	5,900	2,000	69,708

Note \* Recovered metal after milling and smelter and refining adjustments.



# 7 GEOLOGICAL SETTING AND MINERALIZATION

## **REGIONAL GEOLOGY**

The Troilus gold-copper deposit lies within the eastern segment of the Frotet-Evans Greenstone Belt (FEGB), in the Opatica Subprovince of the Superior Province in Quebec (Figure 7-1).

The Frotet-Evans greenstone belt is centrally located in the Opatica Subprovince and extends for 300 km between James Bay, in the west, and Lake Mistissini, in the east, with variable widths, up to 45 km in its eastern extents (Carles, 2000). Its volcanic rocks define an east-west, fault-bounded trending synformal structure (Simard, 1987; Davis et al., 1995). The FEGB volcano-sedimentary sequence can be broadly divided in two similar domains, west and east. Detailed subdivisions have been made by Brisson et al., (1997a, b and 1998a, b, c), and Morin (1998 a, b, c) in a series of geological mapping initiatives developed throughout the greenstone belt by the Ministry of Natural Resources of Quebec. Boily and Dion (2002) divided the FEGB in four distinctive segments: (1) Evans-Ouagama, (2) Storm-Evans, (3) Assinica, and (4) Frotet-Troilus. The eastern domain is known as Frotet-Troilus (Simard, 1987) and has received most of the attention due to its larger economic potential (Figure 7-2).

The FEGB is largely dominated by tholeiitic basalts and magnesian basalts that occur in association with felsic and intermediate calc-alkaline pyroclastic rocks, lava flows, and local ultramafic layers. Syn- to post-deformational gabbroic to monzogranitic plutonic rocks occur throughout the greenstone belt.

The few published U-Pb dates in zircon constrained the age of the FEGB between 2793 Ma and 2755 Ma (Pilote et al., 1997 in Boily and Dion, 2002). The circa 2793 Ma age is coincident with the dates obtained for the Troilus diorite.



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7-2





The Frotet-Troilus domain (Figure 7-3) comprises the east domain of the FEGB and hosts the Troilus deposit. It is characterized by a complex and variable volcano-magmatic history, dominated by mafic volcanic rocks and coeval, cogenetic mafic intrusions, intermediate to felsic volcanic rocks and associated pyroclastic rocks. Minor epiclastic sedimentary rocks and ultramafic units are locally observed.

The domain is divided in two structural regions, north and south, with the limit between them defined by the axial trace of the Frotet Anticline (approximately E-W direction). The rocks are variably deformed and are affected by a strong regional foliation. Sub horizontal mesoscopic to megascopic folds are common, affecting both regional foliation and primary layering. The main regional structures observed in the northern structural domain are: (i) Troilus Syncline; (ii) La Fourche and Dionne dextral fault zones; and (iii) Parker inverse fault zones (Gosselin, 1996). The Troilus deposit is hosted in the northern overturned limb of the Troilus syncline. The Troilus syncline is characterized as an isoclinal fold of northeast-southwest strike. The associated axial plane is parallel to the main foliation in the region, which strikes northeast and has a moderate to steep dip towards the northwest (Fraser, 1993). The La Fourche and Dionne fault zones locally cut and segment the Troilus Syncline and correspond to important deformation corridors with an interpreted dextral sense movement. They are characterized by local centimetric to metre-scale isoclinal folds that affect the main regional schistosity, forming a crenulation cleavage. A locally pronounced, subhorizontal stretching lineation can be observed in places. The Parker fault zones represent a complex array of inverse faults, that are oriented predominantly parallel to bedding and the main regional foliation. The southern domain shows a more complex structural style with a series of major folding systems cut by several fault zones. Faults, axial fold planes and the main schistosity have an overall westnorthwest- east-southeast to northwest-southeast direction.

The regional metamorphic grade in the Troilus area varies from greenschist facies in the internal sectors of the belt to lower-amphibolite facies near the felsic intrusions and the borders of the belt (Gosselin, 1996). The higher metamorphic grade is apparent adjacent to boundaries of intrusions and margins of the greenstone belt.



7-5

RPA



The Troilus region contains many occurrences of gold, base metal, and molybdenite mineralization, with the Troilus gold deposit being the largest. The three largest base metal volcanogenic massive sulphide (VMS) occurrences are the Lessard, Tortigny, and Baie Moleon deposits.

# PROPERTY GEOLOGY

The Troilus deposit is located in the northeastern region of the Frotet-Troilus domain, and is hosted by volcanic and hypabyssal intrusive rocks of the Troilus Group in a region of intense deformation, known as the Parker domain (Gosselin, 1996). It is located within the overturned northern limb of the Troilus isoclinal syncline, which was transposed by a series of northeast-southwest striking thrust fault zones, parallel to the main regional foliation and to the volcanic bedding.

On the property (Figure 7-4), the Troilus Group is represented by a thick volcanic sequence, predominantly mafic to intermediate in composition, with local felsic flows and tuffs. Synvolcanic magmatism is marked by a series of gabbro and ultramafic sills. The main lithotypes which comprise the Troilus deposit region are a metadioritic pluton, an amphibolite, and a brecciated unit, which are all crosscut by a series of felsic dikes (Figure 7-5). Late-stage dikes of mafic composition and syn- to post-tectonic granitic plutons crosscut all these rock types. The lithological contacts and a penetrative foliation steeply dip to the northwest.

The following descriptions for the main lithologies, alteration, mineralization, and structural features are based mostly on a recent description of the 2018 and 2019 drill holes observations by the Troilus Gold geology team, as well as contributions from the works of Brassard (2018), Brassard & Hylands (2019), Diniz (2019), Laurentia Exploration (2018), and SRK (2018).



7-7



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7-9

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## LOCAL LITHOLOGICAL UNITS

Four main lithological units are recognized in the Troilus deposit region, broadly divided in: (i) mafic to felsic volcanic sequence; (ii) diorite and brecciated diorite; (iii) cross-cutting felsic dikes, and (iv) mafic to ultramafic intrusive. A series of distinct younger, post-deformation granitic intrusions crosscut all other lithotypes.

#### MAFIC TO FELSIC VOLCANIC SEQUENCE

Dominantly occurring throughout the entire Troilus property, and surrounding the Troilus deposit region, is a thick sequence of volcanic rocks of variable composition. The south-eastern region is dominated by mafic volcanics, essentially represented by massive and/or pillow basalts. The primary volcanic textures are rarely identified, being completely transposed by a strong regional foliation. Locally, and especially observed in drill cores, the mafic volcanic rocks often display a compositional millimetric to centimetric banding, marked by alternating amphibole-rich green- to dark-green layers, with light-green or white-greyish feldspar and epidote-rich bands (Figure 7-7, photo A). In the deposit region, this lithotype is recognized on the footwall zones of Z87 and Z87S.

The basalt sequence is overlain, in gradual contact, with a more intermediate to felsic composition banded and laminated sequence, as it can be observed in drill cores of Z87S (Figure 7-7, photo E). In this sequence, quartz-feldspar-rich bands and layers are dominant over light-green amphibole layers. Local garnet-rich quartz-rich intervals resembling volcaniclastic rocks occur towards the top of the sequence, as well as amorphous quartz-bands that could represent exhalative horizons.

In the hanging wall portion of the J zones, the volcanic sequence is mainly represented by a finely laminated intermediate rock, grey to light-green in colour, often showing quartz and pink-garnet-rich horizons, that probably represent more volcaniclastic units of the sequence (Figure 7-7, photos B, C, and D). In the southern portion of the J4 pit, an amphibole-rich, volcaniclastic brecciated unit is present, containing intensely altered, irregularly shaped epidote-feldspar-rich clasts. The matrix is locally rich in magnetite.



## FIGURE 7-7 DRILL CORE PHOTOGRAPHS

Metric to decametric-scale lenses of rhyolite are identified within the volcanic sequence, and mainly occur bordering the diorite intrusion in its western margin. White, massive rhyolites outcrop in the southwestern region of the deposit, in the Southwest and Z86 zones, and have also been described in the hanging wall of the J4 pit (Figure 7-7F). They often display an intense sericite alteration, and typically contain millimetric quartz-filled vugs, surrounded by an aphanitic quartz-feldspar matrix.

The contact between the volcanic sequence and the diorite intrusion in the Z87 and J zones region is difficult to identify and appears to be gradational, with fine to very fine grained and laminated rocks, affected and transposed by intense deformation and hydrothermal alteration. Previous geologists have described an amphibolitic unit immediately surrounding the diorite

Mafic to intermediate volcanics. Footwall of Z87 South. B. Volcaniclastic rocks, quartz-feldspar-garnet rich. Hanging wall of J zones. C. Laminated intermediate volcanic rock, mineralized. Hanging wall of J zones (J5 sequence). D. Intermediate, laminated volcanics, Allongé Zone (northern continuity of J zones). E. Felsic volcanics, sulfide rich (Py-Po-Sph), Z87 South. F. Rhyolite, J4. Photos from Troilus team.



intrusion, part of which could represent a metamorphic equivalent of mafic volcanic rocks. A foliated amphibole-rich rock with a penetrative schistosity has also been described in boreholes in the footwall of Z87 and amphibolite is observed in the footwall of Z86 South (Z86S) in the Sand Pit.

#### DIORITE AND BRECCIATED DIORITE

The dioritic unit forms an elongated body oriented in the northeast-southwest direction with a six kilometre strike length and a one kilometre width, entirely surrounded by the volcanic sequence. It represents the main host rock for the mineralization at the Z87, Z87S and J zones. It comprises a pale to greenish-grey rock, composed predominantly of medium to coarse grained crystals of plagioclase and hornblende dispersed in a fine-grained groundmass of feldspar, amphibole, epidote, and quartz (Carles, 2000).

The Z87 hanging wall is mainly represented by brecciated diorite. Metre-scale intervals of massive, coarse to fine grained diorite, as well as porphyritic diorite, alternate with the typical brecciated diorite. The breccia is unsorted and predominantly matrix-supported (Figure 7-8), being characterized by two types of centimeter to decimeter scale pale coloured fragments: (i) massive diorite; and (ii) porphyritic diorite. Overall, fragments vary in size from less than one centimetre to over ten centimetres in diameter, are commonly rounded, and are usually elongated parallel to the main foliation. In less-deformed portions, the fragments are mostly subangular in shape. The matrix is amphibolitic, being primarily composed of fine-grained amphibole and biotite, and minor epidote, quartz, and feldspar grains. A transition from massive to fractured to brecciated diorite has been locally observed in drill core, as well as in boulders around the former open pits.

In the J zones, the diorite is predominantly fine grained, and biotite-rich, particularly within the mineralized intervals. Local metric to decametric-scale, coarse grained to porphyritic diorite are observed in drill core, particularly in the hanging wall of the mineralization. Deep drill holes in the southern portion of J4 displayed thick packages of brecciated diorite, which are shown to continue to depths of up to several hundreds of metres, as was observed in drill hole TLG-ZJ419-105. The sequence is interpreted as the northern continuity of the Z87 brecciated diorite sequence.



The mapped surface contact between the metadioritic pluton and the surrounding volcanic sequence is projected from drill cores, and it is described as a gradational contact. The outer margins of the metadiorite grade into the fine grained intermediate to mafic laminated rock.

The plutonic nature of this unit was first postulated by Carles (2000), which stated that "welldeveloped igneous textures" (coarse grained phases) and the absence of extrusive features would suggest a plutonic nature, possibly emplaced at shallow depth. The fine grained diorite could also locally be the result of grain size reduction during deformation. An analysis of the lithogeochemistry dataset available for the Troilus deposit (Carles, 2000; Larouche 2005) shows several distinct compositions among diorite samples that are associated with the observations of variable textures. These observations strongly suggest a polyphasic intrusive history for the Troilus Dioritic suite, yet a more comprehensive and detailed study is required (Diniz, 2019).

U-Pb zircon dating for the diorite yielded an age of 2791 Ma  $\pm$  1.6 Ma (D. Davis, pers. Commun. In Goodman et al., 2005), making it the oldest age-dated rock unit in the Troilus region.



## FIGURE 7-8 DIORITE BRECCIA PHOTOGRAPHS

Brecciated diorite. A. Block on the waste pile located north of the Z87 pit. Note the elongated aspect ratio of the dioritic fragments, parallel to the penetrative foliation. B. Typical mineralized brecciated diorite in a drill core. Porphyritic diorite fragments in an amphibole-biotite-rich matrix. Photos from Troilus team.



#### FELSIC DYKES

Felsic dikes crosscut the volcanic sequence, diorite, and brecciated diorite, with sharp contacts transposed parallel to the foliation. They occur predominantly around the margins of the dioritic intrusion, consisting of several discontinuous bodies, elongated parallel to subparallel to the main foliation. The felsic dikes vary from massive or aphanitic to phaneritic and strongly foliated depending on the amount of sericite (Figure 7-9).

Two main decameter-thick felsic dikes occur at Z87, comprising the footwall and hanging wall of the main mineralized zone. In the J zone, the felsic dikes occur mainly in the immediate hanging wall of the mineralized diorite, are discontinuous, and occur in an anastomosing pattern, up to ten metres thick. The Z87S zone is dominated by felsic dikes, up to several meters thick, occurring in an anastomosing and locally stockwork-like pattern.

They are variably affected by biotite alteration and by overprinting muscovite alteration. The latter forms a stockwork, probably corresponding to fracture networks. Increasing muscovite alteration may have reduced the competency of the felsic lithology resulting in it being preferentially deformed. Zones of intense muscovite alteration are strongly foliated, and give a banded texture, which can lead to confusing the dikes with a felsic tuff.

Magmatic zircons in one large felsic dike, in the footwall zone of the Z87-zone orebody have been dated and yielded an age of 2782 Ma  $\pm$  6 Ma (Dion et al., 1998 in Goodman et al., 2005; Pilote et al., 1997 in Carles, 2000).







Felsic dikes. A. Outcrop, Z87 pit. Massive to slightly laminated. B. Porphyritic felsic dike showing sericite alteration overprint. Apparently transposed by the main foliation, Z87S. C. Mineralized massive felsic dike showing silicification and sericite alteration, Z87S. Photos from Troilus team.

#### **GRANITIC INTRUSIONS**

The Troilus deposit is located in the vicinity of major granitic intrusions: to the east (the Parker pluton) and to the south (the Parker Junior pluton). Pegmatite, granite dikes, and large granite bodies are observed in drill core, and in the Z87 and J4 open pits. They are present over intervals measuring a few centimetres to over 100 m in thickness. The main granite bodies are observed at depth to the northeast of, and below the Z87 gold trend. They are referred to as the footwall granite.

These intrusive units generally overprint the regional foliation at the sample/core scale, but the foliation is observed to wrap around the competent granitic bodies at the regional scale. This suggest the granite bodies were emplaced during the formation of the foliation in a late- to post-tectonic timing. A preliminary U/Pb age date of 2698 Ma was determined for titanite from the Parker granite (Goodman et al., 2005).



# STRUCTURAL GEOLOGY

The Troilus deposit is hosted in a zone of intense deformation and experienced uppergreenschist to lower-amphibolite metamorphic conditions. At least two regional phases of deformation are recognized in the Troilus deposit region.

## **DEFORMATION PHASE D1**

The main deformation features at Troilus correspond to a west-northwest to east-southeast ductile flattening event referred to here as D1. The main planar structure is a pervasive and ubiquitous foliation, S1. It affects most lithological units at Troilus, except for the post-tectonic granitic bodies. It is oriented N60°E on average, and dips 55° to 70° towards northwest, being slightly steeper in the J zones when compared to the Z87 and Z87S.

Local variations in the foliation orientation could be related to the foliation deforming in proximity to the competent Parker and Parker Junior intrusions. The intensity of the foliation also varies among the different lithologies. Coarse grained diorite is mostly unaffected to weakly foliated. The foliation is stronger in zones of biotite or muscovite alteration, suggesting the deformation is enhanced in altered, auriferous, and less competent zones.

Pre-D1 planar features such as veins, veinlets, and stockworks are variably transposed parallel to the S1 foliation. Similarly, bedding or volcano-sedimentary layering, and geological contacts are transposed parallel to the S1 foliation.

Tight isoclinal F1 folds are associated with an axial planar S1 foliation, and some of these F1 folds can be rootless, illustrating that strong transposition occurred during D1. Fold axes are subparallel to the stretching lineation indicating a strong transposition. This orientation is likely to produce a downdip plunge of gold mineralization parallel to the stretching lineation. The intensity of the deformation and the tight and isoclinal nature of the folds hamper the observation of F1 fold hinges but folding in the Troilus deposit is probably ubiquitous at various scales.

A down-dip stretching lineation oriented -60°,/322° within the foliation is observed to affect diorite breccia fragments. Biotite and amphibole are preferentially oriented parallel to this lineation. The X:Z stretching ratio from breccia fragments is estimated at 6:1 and the Y:Z



flattening ratio is estimated at 3:1, illustrating a strong flattening perpendicular to the foliation combined with a moderate stretching component along the lineation.

Stereonets of main planar and linear structures at Troilus are shown in Figure 7-10.

FIGURE 7-10 STEREONET OF MAIN PLANAR AND LINEAR STRUCTURES



Modified from SRK (2018)

## **DEFORMATION PHASE D2**

At the deposit scale, the second phase of deformation, D2, is marked by northeast-southwest striking, steep-dipping shear zones, identified in the Z87, Southwest, and Z86S zones. These



shear zones are at a low angle with the S1 foliation and crosscut the S1 foliation and quartz veins.

On a regional scale, this second deformation phase also corresponds to important deformation corridors with an interpreted dextral sense movement, La Fourche and Dionne fault zones (Simard, 1987; Gosselin, 1993; Gosselin, 1996), which locally cut and segmented the Troilus Syncline (F1 fold). The zones are characterized by local centimetric to metric isoclinal folds that affect the main regional schistosity, forming a crenulation cleavage. Locally a pronounced subhorizontal stretching lineation can be observed. The Parker fault zones may also have been formed during D2 and represent a complex array of inverse faults, oriented mainly parallel to bedding and to the main regional foliation, occurring in the north-northwest border of the region, marking the contact zone with the granite-gneiss terrane. A high angle stretching lineation verging to the southeast is normally observed (Gosselin, 1993).

## LATE NNE-SSW BRITTLE FAULTS

A series of sulphide-bearing brittle faults are present on the north wall of the Z87 pit. These faults are thin fault zones (less than 0.5 m in width) characterized by a strong muscovite alteration, silicification, and the presence of sulphides. These faults are oriented subparallel to the foliation and are regularly spaced in the pit, with one every 20 m to 50 m. They are commonly present at the contact between felsic dykes and the breccia. Down-dip slickensides, reverse displacement of pegmatite dykes, and subhorizontal to moderate northwest dipping quartz tension veins all indicate a reverse movement. The presence of muscovite, quartz, and sulphides suggests that these are sericitic faults zones that were interpreted as hosting part of the gold mineralization at Troilus, as described in Goodman et al. (2005). No significant increase in gold grade was associated with these fault zones in drill core however, suggesting they are not a significant host of the gold at Troilus. Their brittle nature, and the crosscutting relationship with pegmatite dykes indicate these faults are probably part of a possible younger D3 deformation phase.

#### FRACTURES

Three main fracture orientations are mapped in the deposit area (SRK, 2018). The first set, oriented at azimuth 025° and dipping at -65° west, is subparallel to the regional foliation and represents the major fracture system in the Z87 pit area. The other two sets (035°/25° and 320°/85°) cut the regional foliation almost at a right angle. The combined effect of these fractures has induced local instability in the Z87 pit. Faulting is observed locally in the pit. The



main orientations of the faults are 240°/-55° and 160°/-60°. These two fault orientations do not cause any overall wall stability concerns but may create problems locally.

## MINERALIZATION

The main mineralized zones at the Troilus Property occur around the margins of the Troilus Diorite, and comprise the Z87, Z87S, and the J zones (comprising J4 and J5). Other important mineralized zones discovered to date include the northern continuity of the J zones, named the Allongé Zone, and the southwestern margin of the metadiorite (comprising Z86 and Z87S zones).

Troilus is primarily an Au-Cu deposit, but contains minor amounts of Ag, Zn and Pb, as well as traces of Bi, Te, and Mo. Gold-copper mineralization at the Troilus deposit comprises two distinct styles, disseminated and vein-hosted. Gold mineralization is spatially correlated with the presence of sulphides, even though the sulphide content does not directly correlate with gold and copper grade. The matrix of the diorite breccia, the diorite and the felsic dikes represent the main host rocks for the mineralized intervals.

## TYPE I – DISSEMINATED MINERALIZATION

Disseminated mineralization comprises the majority of the deposit's copper content (>90%, Goodman et al., 2005), particularly in the Z87. Gold and copper are predominantly associated with fine grained disseminated sulfides and/or millimetre wide sulfide streaks and stringers parallel to the main foliation, comprising between 1 wt. % and 5 wt. % of the rock. The most abundant sulfides are pyrite, chalcopyrite, and pyrrhotite.

Gold occurs as fine grains of electrum, up to 20 µm wide along sulfide grain boundaries, and filling fractures within sulfide grains, containing up to 15 wt. % Ag (Goodman et al., 2005).

At Z87, the mineralization is developed within an amphibolitic unit and the brecciated unit, located between the two thickest felsic dikes (Goodman et al., 2005), and it is coincident with a zone of strong biotitic alteration.



#### FIGURE 7-11 DISSEMINATED MINERALIZATION AT TROILUS DEPOSIT



Disseminated pyrite in a fine grained, biotite-rich, diorite. J4 zone. B. Brecciated Diorite. Fine sulfides disseminations in the amphibole-biotite-rich matrix. Z87. C. Disseminated medium grained pyrite in volcanic laminated rock in J5 zone. Photos from Troilus Gold Corp. team.

### TYPE II – VEIN-HOSTED MINERALIZATION

This mineralization style is characterized by gold bearing veins, with gold mineralization restricted to the veins and veinlets, and is classified as gold-only, since copper mineralization is rare and erratic (Carles, 2000). This type of mineralization is reported to be hosted in all rock types occurring within the mineralized envelope in the Troilus deposit.

Several generations of gold-bearing veins have been identified and described by Goodman et al. (2005), and Larouche (2005), the latter especially focused on J4 zone. With regards to grade and abundance, the most significant are quartz-chlorite (±tourmaline) veins. These veins occur in silicified wall rocks to sericitized high strain zones which cut the main foliation and the margins of felsic dikes. Gold-bearing millimetre- to centimetre wide veinlets are locally present as swarms parallel or subparallel to spaced cleavage in the silicified rocks. The veinlets contain free gold and minor amounts of sulphide. Much of the gold is fine grained and contains up to 20% Ag, however, gold grains can be up to greater than 1,000  $\mu$ m in size. Locally, a second set of gold bearing quartz veinlets cut the first. These carry fine grained gold (>95%) and minor pyrite, chalcopyrite, sphalerite, galena, and Te- and Bi-bearing minerals, including tellurobismuthite (Bi<sub>2</sub>Te<sub>3</sub>), calaverite (AuTe<sub>2</sub>), and hessite (Ag<sub>2</sub>Te). Although volumetrically much less significant than the main disseminated mineralization, the veinlets



can contain grades greater than 50 g/t Au over a one metre interval. Coarse grained gold recovered by a gravity circuit in the mill accounted for about 30% of the gold produced. Presumably much of this coarse gold was derived from the veins. High grade shoots related to the veinlet zones are oriented 40° clockwise from the main disseminated mineralization.



FIGURE 7-12 VEIN-HOSTED MINERALIZATION

Millimetric Py-Po-rich veinlet in an altered felsic dike (sericitization and silicification). Z87S. B. Atypical very high grade quartz veins, up to over 1-meter-thick. Remobilized Py-Ccp-Po. J zones.

#### ALTERATION

Gold mineralization at Troilus is associated with various types of alteration described below.

#### BIOTITE

An early, pervasive, weak to strong biotite alteration affects the diorite, breccia, and felsic dykes. The matrix of the breccia is preferentially altered. This alteration style is widespread in the deposit and can extend up to tens of metres away from the main gold zones. Sulphide content in drill core increases with biotite alteration intensity, suggesting a genetic link between the two. The biotite is transposed parallel to the foliation, indicating alteration occurred prior



or during the main deformation event. The foliation intensity increases in strongly biotite altered intervals, due to the lower competency of the biotite-bearing rocks.

#### MUSCOVITE

The vein-hosted mineralization is spatially related to a strong sericitization within the high strain zones, better developed in the felsic dikes, reaching up to several centimeters (Carles, 2000). Sericitization is also present in the amphibolite and the matrix of the breccia. A weak to strong muscovite alteration is present in some felsic dykes and varies in texture from pervasive to stockwork. It also locally alters the diorite and the breccia. Gold mineralization can be present in muscovite altered rocks, but sulphide content does not increase with the presence of muscovite alteration. Muscovite stockwork-like textures are locally transposed by the main foliation, indicating muscovite alteration occurred after biotite alteration but prior or during the main deformation event. Zones of higher foliation intensity, and thus of higher deformation, occur in strongly muscovite-altered rocks. The most highly deformed and sericitized parts of the rock are commonly surrounded by a silicified envelope that could reach several meters in width.

#### CALCIC METASOMATISM

A syn-deformation epidote-amphibole alteration occurs both pervasively and as veins in the deposit area. It consists of pervasive calcium-rich minerals such as calcium amphiboles, epidote, or calcite occurring in two metre- to ten metre intervals in drill core, or in discrete layers or bands measuring less than 20 cm. Veins of quartz, calcite, epidote, grossular garnet, and diopside may also be locally present. Gold mineralization is present locally in calc-silicate altered rocks, however, barren calc-silicate altered rocks also occur. Calc-silicate bands and veins can be parallel to the foliation, folded by the main deformation event, or can crosscut the foliation, all indicating that calc-silicate alteration occurred during the main deformation event.







## **ZONE 87**

The main pit of the Troilus Mine, operated by Inmet from 1996 to 2010, was developed in the Z87 orebody. The mineralization in the Z87 occurs as a series of anastomosing lenses, extending for approximately 1,300 m along strike from 12,900N to 14,200N with variable thickness and locally reaching over 100m wide. With increasing depth, individual mineralized lenses coalesce to form a single sheet-like body that was approximately 40 m thick on average (Fraser, 1993).

The long axis in the Z87 is oriented N35°E with the orebody dipping to 55° to 65° northwest, from southwest- to northeastern portions, respectively. Detailed studies of Z87 blasthole data and diamond drill intersections revealed the presence of higher-grade shoots, which plunge to the west-northwest at -30° to -50°. The north and south extensions of Z87 "horsetail" out into narrower branches of mineralization. Two branches are well defined in the north, whereas three branches are less defined to the south.

In Z87, the peak of enrichment in gold and copper overlap but are not exactly coincident. A metal zonation is observed, associated with the sulfide content. The structural footwall is enriched in a chalcopyrite-pyrrhotite assemblage, with copper more abundant than gold. This zone grades into an intermediate pyrite-chalcopyrite zone, which comprises the main ore zone of the deposit and contains gold and copper. The structural hanging wall is dominated by pyrite, and it is gold-rich relative to copper.

#### ZONE 87 SOUTH

Z87S is located directly southwest of the main former open pit mine, Z87. The two zones are separated by a felsic dyke and a zone of intense deformation dipping at 45° to 55° northwest. Z87S itself dips of ~50° northwest. This angle suggests Z87 and Z87S may merge at approximately 450 m below surface. The presence of a gold rich interval below Z87 in borehole TLG-Z8718-002 is probably the expression of Z87S at depth.

The 2019 drill program in Z87S was designed to follow-up on the positive few holes drilled in this zone in 2018. The new results have outlined extensions of mineralization to the south and down-dip of the previously known mineral envelope in Z87.

The mineralization at Z87S is visually comparable to what is seen in the main zone of Z87, however the geology can be characterised as more felsic (silicic) alteration and is distinctly



transitioning into a unit of massive sulphides (primarily pyrite with chalcopyrite) in the footwall. A preliminary geochemical study of Z87S has a recognizable base metal signature that is unique to this area. This zone also exhibits the same structural pinch and swell nature of mineralization as the other main mineralized zones.

The host rock of that sulphide- rich zone is characterized by and intermediate to mafic volcanic unit similar to the sulphides rich zone of the hanging wall of J4 corresponding to the south-western extension of the J5 zone.

#### J ZONE

The J Zone orebody hosts two mineral zones: J4 and J5. J4 is the smaller of the two formerly mined open pits along with the main Z87 zone. The ore bodies in the J4 zone are hosted in the northern continuity of the Troilus Diorite and, similarly to what is observed in the main zones Z87 and Z87S, are elongated parallel to a penetrative northeast trending foliation, moderately to steeply dipping to the north west.

From top to bottom, the sequence comprises (i) a volcaniclastic unit, occurring along the hanging wall of the mineralization, and composed of well laminated intermediate to felsic rocks, locally mineralized, with semi-massive sulfide occurrences; and (ii) a thick metadioritic unit, comprising fine to coarse grained diorites that are locally brecciated. They are commonly crosscut by decametric to metric-scale felsic dikes, which are mostly concentrated in the upper parts of the sequence, in the immediate hanging wall of the mineralized intervals. Towards the bottom of the sequence, in the footwall, typical diorite breccias are present, displaying intense silicification and being locally importantly mineralized.

The main mineralized intervals in the J4 zone are characterized by sulfide stringers and fine sulfide disseminations along the foliation occurring within a very fine grained biotite-rich and silicified diorite. Pyrite is the main sulfide, and it is intrinsically associated with gold mineralization.

Results from hole TLG-J419-092 extended the limits of the gold-rich mineralization outside of the known mineral resource envelope both at depth and to the east. This zone located in the footwall of the main gold zone of J4 is characterized by a far less deformed texture than typical J Zone mineralization with clear brecciation and disseminated sulphides within the recognizable Troilus Diorite was identified in the stratigraphic footwall.



Compared to Z87, the J4 Zone has a lower copper grade, more free gold, and dips more steeply at -65°. J4 extends for approximately 1,200 m from 14,100N to 15,300N and is approximately 200 m wide from 9,500E and 9,700E. Individual mineralized shoots plunge steeper to the north. The north half of J4, from approximately 14,600N, contains one main corridor of mineralization, which is 20 m to 50 m in horizontal width. Grade-contoured blasthole data reveal the presence of closely spaced lenses, which strike to mine-grid northeast and dip towards mine-grid northwest. These lenses are located within and extend beyond the interpreted mineralized envelope limits. In the southern half of J4, three main lenses of generally lower grade and more diffused gold mineralization have been identified. The mineralization here averages approximately 100 m in horizontal width with intervening waste.

# **EXPLORATION POTENTIAL**

This section details lithological and structural particularities of the following potential mineralized extension zones (Figure 7-14):

- Z87 North Extension
- L4 South Extension
- J4 West Extension (J5 South Extension)
- J zones North Extension (Allongé Zone)

## Z87 NORTH EXTENSION

The northernmost current borehole at Z87 is TLG-Z8718-044W. The mineralized horizon is intersected near the bottom of the hole. The intersection includes 10.58 g/t Au equivalent over two metres, and 7.82 g/t Au equivalent over six metres (Troilus Gold press release, October 31, 2018), and could correspond to the downdip extension of a gold trend present at surface. The intersection of gold in TLG-Z8718044W opens the potential for an extension of the gold mineralization to the north.

**Near Surface Potential:** Most of historical holes drilled at the northern extension of Z87 Pit are enriched in gold. Holes KN 38, 39, 46, 101, 102, 139, 376, 397 and 398 show gold values that can be traced up to one kilometre and follow a 360° trend.

**Deep Potential:** Hole TLG-J419-105, drilled from the hanging wall of J4, confirmed that the same geological sequence from Z87 can be trace as far as 650 m to the north of the Z87 Pit at a vertical depth of 750 m.







### J4 SOUTH EXTENSION

The Zone J4 gold trend at surface bends to the south and toward Z87. In TLG-ZJ418-076 and 083, the best auriferous intersections are located at the bottom of the hole, which validates the interpreted change of direction of the main gold trend. The main potential for the extension of Zone J4 to the south lies in the area between J4 and Z87, however, the potential for gold mineralization is also open to the south-southwest and to the west.

#### J4 WEST EXTENSION (J5 SOUTH EXTENSION)

The results of the 2019 drilling program have significantly extended the boundaries of known mineralization at depth from the northeast to the southwest in the J4 Zone, well beyond the formerly mined J4 pit. The shallower intercepts of most holes are believed to be mineral extensions from the neighbouring J5 mineral zone. This is further evidence that suggest that J4 and J5 zones may prove to be one and the same. The J4 and J5 zones remain open at depth.

## J ZONE NORTH EXTENSION (ALLONGÉ ZONE)

In October 2018, Troilus began a preliminary surface exploration program focused on applying its newly developed structural and geological model regionally to the Troilus belt. A total of 172 samples were collected from 157 outcrops and were sent for assay. Results have defined a clear extension of mineralization from J Zone over a strike length of 1.8 km extending from the edge of the J Zone to the northeast. Prospecting and mapping have identified additional gold-bearing mineralization located along the northeasterly strike projection of the J Zone. These newly discovered units, paired with minimal local historic drilling, have opened the potential to expand the Troilus deposit to the northeast.

Highlights:

- 110 g/t Au (visible gold) from rock grab sample approximately one kilometre along strike from J4 open pit hosted in foliated diorite, the same host rock as the J Zone;
- 4.33 g/t Au, 1% Cu, and 49.5 g/t Ag from channel sampling located directly adjacent to the Troilus North and 1.8 km northeast of J Zone;
- 1.9 g/t Au, 0.3% Cu and 16.3 g/t Ag hosted in altered rhyolites from a grab sample located directly southwest of 4.33 g/t channel sample;
- 1.4 g/t Au, 0.6% Cu, and 10.3 g/t Ag from channel sampling less than 400 m from the northeast limit of J4 open pit.



Based on the encouraging 2018 surface results, an exploration drilling program was carried out in 2019, with a total of 12 DDHs on three sections spaced 500 m apart. The new results have successfully confirmed the potential to extend the J Zone mineralization to the northeast.

The mineralized intervals in the Allongé Zone lie within the same geological sequence present in the hanging wall of the J zones, comprising a finely laminated intermediate to mafic volcanic sequence, locally intercalated with rhyolite metric layers, and the Troilus Diorite, which continues north up to the southern margin of the Allongé Lake (Figures 7-15 and 7-16). Gold mineralization is observed to be associated with pyrite-rich millimetric-scale layers and stringers that are oriented parallel to a penetrative northeast foliation, occurring both within the diorite and the volcanic sequence.


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Source: Troilus, 2019.

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# 8 DEPOSIT TYPES

The Troilus deposit is better known, and it is frequently cited (e.g. Robert and Poulsen, 1997; Poulsen, 2000; Sinclair, 2007; Mercier-Langevin et al., 2012; Katz, 2016), as an example of an Archean porphyry-type deposit as interpreted in the pioneering work of Fraser (1993). Other interpretations for its genesis include superimposed structurally controlled "orogenic" gold, proposed by Carles (2000) and Goodman et al., (2005). Table 8-1 presents a summary of the main geological characteristics that supported these two models (Diniz, 2019).

#### TABLE 8-1 SUMMARY OF THE MAIN GEOLOGICAL CHARACTERISTICS SUPPORTING THE PROPOSED GENETIC MODELS FOR THE TROILUS DEPOSIT

Model	Timing	Host Rocks	Sulfides and Metal Associations	Texture/Style	Alteration	References
Au-Cu Porphyry-type	Single stage pre- deformation, pre- metamorphism	In situ hydrothermal breccia, amphibolite, and felsic dikes	Au-Cu zoning; Cu-rich footwall (Ccp+Po) Intermediate Main ore zone: Au-Cu (Py+Ccp); Au-rich hanging wall (Py)	Disseminated and stringers along the foliation. Gold in sulfide grain boundaries and filling fractures.	Main stage potassic alteration (biotite), zoning outwards to a propylic alteration; and phyllic analogous sericitic alteration	Fraser (1993) Larouche (2005)
Multi-stage syn- deformational	Early, pre-peal metamorphism and Late, post-peak metamorphism Modified from Diniz (	Early stage restricted to magmatic breccia and amphibolite, Late stage veins in the breccia, amphibolite, and felsic dikes 2019).	Early stage Au-Cu (Py+Ccp+Po) Late Au-only mineralization (Py mainly, Sp-Gn locally)	Early disseminated and stringer zones Late Qtz-Chl-Tur veins	Main biotic alteration (early stage) Late stage sericitic alteration and silicification halo around quartz veins	Carles (2000) Goodman et al. (2005)

The genetic model proposed by Fraser (1993) is based on similarities between Troilus and typical Phanerozoic porphyry deposits. The author interpreted that the biotite-rich zone that accompanied the bulk of mineralization at Troilus would be analogous to the typical potassic hydrothermal alteration core of porphyry deposits being that biotite, the main indicator mineral for this alteration, also occurs in the felsic dikes. Sericite would be the second most common potassium-rich mineral, largely dominant in the felsic dikes. In Z87, this zone would be centered in the footwall dike and would grade outwards into a propylitic zone, defined by a gradual decrease in biotite and amphibole content, and increase in albite, epidote, and calcite. The alteration zoning would be asymmetric, being better developed towards the hanging wall. Associated with the asymmetrical alteration, a metal zoning marks a footwall dominated by biotitic alteration, and chalcopyrite-pyrrhotite assemblage, being copper-rich, whereas towards the hanging wall, gold would prevail over copper, and would be associated with potassium decrease and sodium increase, and pyrite would be the main sulfide. The in-situ hydrothermal



breccia marked the transition, intermediate zone. In addition to what was proposed by Fraser (1993), Boily (1998) suggested that the observed sericitic-quartz association would represent an equivalent of typical phyllic alteration of a porphyry mineralizing system.

Larouche (2005) supports the magmatic-hydrothermal genetic model for the Troilus deposit, although presenting a slightly different chronology of alteration and copper and gold mineralization events. The felsic dikes would have intruded the amphibolite and diorite, followed by brecciation of the host rocks by hydraulic fracturing, and potassic alteration and gold-copper mineralization development. The potassic zone and the mineralization would have been subsequently superimposed by the propylitic alteration, forming late epidote-calcite-quartz veinlets. A final hydrothermal event would have released fluids via felsic dikes, originating a sericitic alteration, better developed in the felsic dikes, and mainly associated with gold mineralization.

Carles (2000), later supported by Goodman et al., (2005), suggested that the Troilus deposit is the result of two superimposed unrelated and structurally controlled mineralization events. The earliest event would be responsible for the introduction of disseminated Au-Cu mineralization in association with biotitic alteration and would be restricted to the mafic rocks (amphibolite, the matrix of the breccia and biotite-rich zones in the metadiorite), only occurring in the margins of the felsic dikes. In the Z87 the mineralization related to this stage would be restricted to a corridor bounded by the felsic dikes. Carles (2000) suggested that the "early stage" mineralization would represent an amphibolite-metamorphic-grade example of "orogenic" gold deposits. Carles (2000) also argued that the potassium enrichment would represent a typical characteristic of lode gold deposits in amphibolite facies conditions, according to Groves (1993).

The vein-hosted mineralization would be part of a second mineralizing event, or stage, and it is interpreted as a typical "orogenic" gold type by Carles (2000) and Goodman et al., (2005). It would have been caused by hydrothermal fluids focused into the wall rocks of the felsic dikes, and within deformation zones. Gold would have been either remobilized from previous stage concentrations or introduced from a new source and would have precipitated along with quartz-sulfide veins accompanied by sericitic alteration (Goodman et al., 2005).



#### **DISCUSSION – CURRENT GENETIC MODELS**

The close spatial relationship between gold and copper mineralization and the porphyritic intrusions in the Troilus deposit are also described in a series of other large Archean gold deposits. Some of these deposits, such as the Canadian Malartic and the McIntyre, share, at least in part, similarities with porphyry and/or intrusion-related gold deposits and could be genetically related to the porphyritic intrusive host rocks (De Souza et al., 2017; Mason and Melnik; 1986, Melnik-Proud 1992; Brisbin 1997 in Dubé et al., 2017).

At the same time, a strong structural control of the main ore zones is observed, commonly associated with hydrothermal alteration typical of greenstone-hosted gold deposits (Groves, 1998, Poulsen, 2000; Dubé and Gosselin, 2007), which led to the interpretation that, at least in part, gold had been introduced to the system syn main deformation phases.

Two distinct styles of mineralization in terms of metal content, hydrothermal alteration, and host structures, are described in the Troilus deposit, similarly to what is observed in the examples discussed above. The combination of more than one style of mineralization can represent evidence of multiple stages of gold mineralization, in the cases discussed, an early magmatic-hydrothermal event followed by syn-deformational gold input and remobilization. However, these deposits represent well known and largely studied examples, while the Troilus deposit is still poorly understood, and most of the current interpretations lack clear evidence to determine whether the distinct styles of mineralization are different in age and nature or not (Diniz, 2019).

Based on this, and similarities with other known multi-stage ore systems in the Abitibi greenstone belt (e.g. Canadian Malartic, McIntyre), as well as other magmatic-hydrothermal deposits (e.g. Côté Gold), it seems that at least the disseminated style of mineralization observed in Troilus, associated with a strong biotitic alteration, would have formed by magmatic-hydrothermal processes (Diniz, 2019).



# 9 EXPLORATION

Exploration history of the Project is directly linked to the history of the discovery and development of the Troilus deposit discussed in Chapter 6 of this report. In addition to the drilling completed in 2018 and 2019, Troilus compiled historical data and carried out field mapping and prospecting programs. Some grab samples were taken and assayed for gold following the procedures discussed in Section 11, although these assays were not used for the resource estimate.

A review of all the lithogeochemical data by Inmet indicated that a large halo with gold values greater than 200 ppb is present around Z87 and J4. Compilation of drill hole data for holes drilled away from the Troilus deposit has shown that there are a number of holes with gold values greater than 200 ppb over ten metres. Systematic drilling of all these zones was undertaken between 1997 and 2004. No zones of economic mineralization having the size and grade of the Troilus deposit were found.

Field mapping and prospecting work in both, 2018 and 2019, helped Troilus' team to improve the understanding of the lithological and structural controls on gold mineralization across the property, and confirmed the overall potential for extending the current known limits of the main mineralized zones.

In 2018, Troilus field exploration program focused on the potential to extend the known gold mineralization in zones J4 and J5 further to the north and at depth, which have been confirmed in the 2019 diamond drilling program (i.e., J zones increased mineral resources, and northern extension Allongé Zone, former J4 North Extension).

The 2018 program also included a surface exploration program across zones Z86 and Southwest, which is expected to become a diamond drilling target in 2020.

The south extension of Z87, called Z87S have also been drilled during the 2019 drilling program, based on historical compilation work developed over the previous years, and culminated with the delineation of important mineral resources, part of the current estimate report.



The 2019 field exploration program has been focused on the recently acquired Troilus North Property, aiming to evaluate the overall potential along the Troilus trend further north. The program was carried out in two phases during the summer/fall 2019, with the first reconnaissance phase including geological mapping, extensive soil sampling survey, and channel sampling, followed up by the second phase where by detailed soil survey and channel sampling within potential targets delineated in the first phase were conducted.

### TROILUS NORTH PROPERTY

Two main volcanic sequences are present on the property. Occurring mainly in the northwestern region of the belt is a sequence consisting of basaltic to andesitic amphibolitized lavas, locally pillowed, likely of tholeiitic to ferro-tholeitic affinities. These rocks typically display very little to no sulfide content, and little biotite and silica alteration.

The second major volcanic sequence, located south of the latter, is intruded by the massive Parker granitic intrusion, and is the same phase that hosts the Troilus diorite and mineralized occurrences in the southern portion of the corridor. This second volcanic series consists of volcaniclastic intermediate to felsic tuffs and lavas.

Overall the entire sequence exhibits strong pervasive silicification and biotite and/or sericite alteration and comprises the hosting lithological unit for main mineralization occurrences in the Troilus North Property.

A new showing North of Lac Allongé, the Carcajou showing reported two samples over 3.5 g/t Au, one kilometre east of the north-northeast Lac Allongé showing (5.55 g/t Au outcrop), and four kilometres northeast on strike with the Lac Allongé zone. The mineralization consists of low content fine grained pyrite hosted in the felsic to intermediate volcanic rock, disseminated and stretched in the foliation, as commonly observed in the J4 Zone.

Geophysical work and associated outcrop mapping show a general trend that hosts the Project, continues along Parker pluton (granite) to the Northeast and through most of the Troilus North property. Recent mapping and data compilation demonstrate that mineralized zones at the J Zone continue on to Troilus North.



Due to its size and lack of previous exploration work, the Troilus North land package remains open for discovery, specifically along a magnetic low trend which can be followed over 4.5 km from the J Zone to the high-grade boulders outlined by Inmet in the 1980s (>10 g/t Au), and over ten kilometres along the Northeast trend (Figure 9-1).

A portion of the 2020 exploration expenditures will be directed towards activities at Troilus North. The integration of historical information plans for surface mapping and sampling as well as target prioritization for future diamond drilling have already commenced.





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### SOUTHWEST ZONE

In 2000, a 500 m long anomalous gold envelope, named the Southwest Zone, with similar characteristics to Z87 was discovered at the southwest end of the Troilus Diorite. Several holes were drilled in early 2005 using Ingersoll Rand DML downhole hammer drill rigs (DML) to investigate the potential of having near surface mineralized material that could be mined and trucked to the Troilus mill.

The Sand Pit, discovered in 2018, is located at the southern limit of the Southwest Zone and is dominantly composed of an auriferous breccia intruded by a series of intrusions, including felsic dikes. A series of amphibolite outcrops are present to the southeast, and diorite (unbrecciated) is present to the northwest. The breccia and sulphides are strongly transposed, and some remnants of folds can be observed, which indicates a pre- to early-D1 emplacement of the sulphides. They are preferentially hosted in the breccia matrix. The felsic dikes are altered, however, with only minor crosscutting quartz-sulphide veins, while the host breccia contains good disseminated sulphides content. All the observations suggest that Troilus-style gold mineralization is present in the southwestern extremity of the Troilus diorite intrusion.

Channel sampling results obtained in the Sand Pit, associated with historical mineralized boreholes, and a well know favorable lithological and structural characteristics, confirm that the southern portion of the Troilus intrusion represents a prospective exploration target. Additional diamond drill holes have been planned to test the full extent of the zone.



# **10 DRILLING**

Since 1986, Troilus and its predecessor companies have used similar procedures for drilling. Table 10-1 summarizes the diamond drilling programs completed on the property to date. There was no drilling on the property from 2008 to 2017. The current resource drill hole database contains 805 drill holes totalling 199,225.7 m and most of the drill holes targeted Z87 and J4. This includes 90 holes totalling 37,018 m from 2018 and 80 holes totalling 35,217 m from 2019. Most of the 2018 and 2019 drill holes targeted Z87 and the J zones at depth and along strike. A small number of the 2019 exploration holes that do not impact the current resource work are not included in the resource drill hole database.

Years	Contractor	Core Size
1986-1989	Morissette Diamond Drilling	BQ (36.5 mm)
1990	Morissette Diamond Drilling	NQ (47.6 mm)
	Benoit Diamond Drilling	
	Chibougamau Diamond Drilling	
1991-1993	Benoit Diamond Drilling	NQ
	Chibougamau Diamond Drilling	
1995	Benoit Diamond Drilling	NQ ("KN" holes)
	Morissette Diamond Drilling	BQ ("TN" holes)
1997	Chibougamau Diamond Drilling	NQ ("KN" holes)
		BQ ("TN" holes)
1999	Forages Mercier	NQ
2000	Chibougamau Diamond Drilling	NQ (on Z87 and J4 zones)
		BQ (elsewhere)
2002	Chibougamau Diamond Drilling	NQ
2003-2005	Forages Mercier	NQ
2007	Forages Mercier	NQ
2018	Chibougamau Diamond Drilling	NQ
2019	Chibougamau Diamond Drilling	NQ

# TABLE 10-1DRILLING SUMMARYTroilus Gold Corp. – Troilus Gold-Copper Project

Almost all holes were drilled perpendicular to the stratigraphy, towards the southeast or mine grid east, and have dips varying from 45° to 90°. In the earlier programs, AQ (27 mm) and BQ (36.5 mm) size core was used. NQ (47.6 mm) coring started in the early 1990s. From 1986 to 1996, all casings were left in the ground. From 1997 to 1999, all casings from "KN" holes drilled during that period and located in the immediate Z87 and J4 area were removed, while casings for other "KN" holes and all "TN" holes were left in place. Between 2000 and 2005,



all casings for "KN" holes were removed after completion and those for holes starting with "TN" were left in the ground. In 2018 and 2019, all NQ casings were left in place.

From 1986 to 1997, the core was split, with half of the core placed in wood boxes that were tagged with Dymo tape and the remaining half sent to the laboratory for assaying. The drill core for holes drilled up to 1996 is stored outside in core racks at the Opemiska Mine site in the town of Chapais. The more recent core (post-1997) is stored in racks and pallets at the Project site. Some holes were moved from Chapais to Troilus. Core racks are made of steel or wood and steel. There is no roofing to cover the racks and there is no fencing around the core racks. Starting in 1999, whole core was sent for assay and a 10 cm to 20 cm length of core was retained as a witness of the interval. In 2018 and 2019, core was sawn in half, with one half sent for assay and the other retained. The retained half was placed in wooden boxes and stored in new metal core racks with roofs. The core is stored at the mine site.

The older holes (pre-1990) were converted to the metric system and verified by Inmet prior to inserting them into the database. All holes have had a survey test taken downhole. From 1986 to 2002, acid dip tests and Tropari instruments were used systematically. In 2003, a Reflex Multishot digital survey started to be used. The collars of all holes drilled in the vicinity of the Troilus deposit were surveyed using the mine grid coordinate system. For exploration holes outside the mine area, cut line grid coordinates were converted to the mine grid system. The elevations for these holes was estimated from topographic maps. In 2018, the holes were downhole surveyed using either a Reflex or EZ Gyro device. A Multishot survey was done at the end of each hole (Reflex = 3 m increments, EZ GYRO = 20 m increments). Drill holes were initially located in the field using either a differential global positioning system (GPS) or a handheld GPS. After they were drilled, all holes were surveyed using a differential GPS by a professional surveyor.

All drill holes were used for geological interpretation. Drill holes on the Z87 and J4 zones are generally on cross-sections at 50 m spacing, with some in-fill holes on intermediate sections spaced 25 m apart.

Core logging was done for major and minor lithologies, alteration type, and mineralization. Sample lengths in the earlier programs (pre-1990) were not constant and depended on mineralization and geology (dikes, contacts, etc.). In the subsequent programs, it was found that the mineralization was very diffuse throughout the geological units and thus systematic



one metre long samples were taken, regardless of the geology. Rock Quality Designation (RQD) measurements were systematically taken during the 1991 drilling campaign. In the following drill programs, RQD was done only on a few holes selected on each section drilled. In 2005, RQD measurements were again systematically taken. Core recovery is excellent and averages over 95%. In 2018 and 2019, all core was photographed, dry and wet, as a standard logging procedure.

Lithogeochemical sampling was carried out sporadically throughout the different drilling programs.

A number of geologists have logged the Troilus core. Over the years, the lithological names evolved, generally from volcanic origins to more intrusive origins. The Troilus geology department has assembled a diamond drill core reference suite of the main lithological units and alteration products on the property to standardize the more recent nomenclature. In 2018, as knowledge evolved, some lithological naming was updated to fit with increased levels of understanding.

RPA has not identified any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

RPA recommends that Troilus scan and build an electronic archive of the historical drill logs and core photographs. RPA also recommends adding a date field to the drill hole database.

The drill holes are shown in Figure 10-1. The black drill hole collars are pre-2018, the blue are from 2018, and the red are from 2019.







## 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

During the earlier (pre-1990) drilling programs, core sample intervals were selected based on visible mineralization and geological contacts. After 1990, one metre samples were taken systematically in the mineralized zones, regardless of the geology. Also, resampling of the pre-1990 holes was carried out to fill in gaps in the sampling. In 1999, a new sampling and metallic sieve based assay protocol was introduced. This protocol included increasing the sample length to three metres and was applied to all samples located within mineralized zones. The sample length for samples located outside the mineralized zones was set at two metres, and these samples used a sampling protocol that involved fire assaying a 30 g subsample. From 1999 to 2002, most of the Z87 diamond drill core samples were three metres in length and most of the J4 Zone samples were 2.5 m in length. For the 2002 J4 zone drilling, the mine laboratory adjusted the protocol to a 2.5 m length. In 2004, all sample lengths were reduced to two metre lengths. In 2018, all samples were one metre in length with few exceptions with shorter intervals. During the 2019 program, the sample length was changed back to two metres.

Before 1999, drill core samples were split into two parts with a hydraulic splitter: one half of the core was sent for assay and the other half was put back in the core boxes for future reference, metallurgical work, or additional check assaying. Since the mineralization consisted essentially of disseminated pyrite and given that there was not a good correlation between pyrite abundance and gold grade, the logging geologists found that it was virtually impossible to visually estimate gold grades

In 1999, following the studies and recommendations by Pitard (1999), a new sampling protocol was applied to all subsequent drilling programs. The protocol involved taking three-metre lengths of whole core instead of one metre lengths of split core. Again, this was done systematically, without considering geological contacts or dikes. Pitard strongly suggested that this sampling procedure would be more appropriate for the type of mineralization at Troilus than the previous method used and should significantly reduce the sampling error. Assay data compilation from the 2004 and 2005 diamond drilling programs shows that reducing the sampling length to two metres did not increase the sampling error significantly.



#### SAMPLE PREPARATION AND ANALYTICAL PROTOCOLS

Since 1986, a consistent sample preparation protocol has been employed at Troilus prior to shipping samples for analysis. All core samples are marked, tagged, placed in plastic bags, sealed, and temporarily stored in the secure core shack. When sufficient samples are accumulated, they are shipped by truck to the assay laboratory. Prior to 1997, samples were shipped off site to certified assay laboratories. From 1997 to 2007, samples were assayed on-site. In 2018, all samples were sent to independent certified assay laboratories, AGAT Laboratories Ltd. (AGAT) and ALS Global (ALS). In 2019, all samples were sent to ALS. Both AGAT and ALS have been assessed by the Standards Council of Canada (SCC), found to conform to the requirements of ISO/IEC 17025:2005, and are recognized as an Accredited Testing Laboratory for a number of specific tests, including gold fire assaying, that are listed on the SCC website (www.scc.ca).

Several laboratories and different assay techniques have been used at Troilus over time. During the first drilling programs (1986 to 1991), several independent laboratories, including Swastika Laboratories (Swastika), were used for assaying the core samples. Bondar-Clegg and Chimitec used a half assay-ton (AT) fire assay technique with a direct coupling plasma (DCP) finish. Following an extensive assaying comparison program in 1992 between several laboratories using different techniques, Swastika was retained to do most of the analyses from 1992 to 1997, when the Troilus laboratory became operational. It was determined that the one-AT fire assay with gravimetric finish technique used by Swastika was more accurate for assaying gold than the half AT method used at the other laboratories. Consequently, from 1992 to 1999, all samples were assayed for gold by one-AT fire assay with a gravimetric or atomic absorption (AA) finish depending on the size of the "doré bead". If the bead was visually judged too small to be weighed, then the bead was dissolved, and an AA finish was used. Copper and silver were analyzed by AA spectrometry.

Prior to assaying, the original one metre split core sample, weighing approximately 2.7 kg, was entirely crushed down to 0.25 in. Then, 350 g was pulverized to -150 mesh (105 microns) and a one-AT (29.17 g) fire assay was done. The rest of the sample (pulp and reject) was stored for future use.

In 1999, along with the new sampling method, a new assay protocol was introduced, based on the recommendations by Pitard (1999). The new assay protocol involved assaying a much



larger sample than that used for the standard fire assay in the previous programs (1,000 g versus 30 g). This protocol was designed to reduce the Fundamental Error (i.e., error generated by sample and subsample weights), the Grouping and Segregation Error (i.e., error generated by gold segregation and the way samples and subsamples are split), the Extraction Error (i.e., error generated by poor sample recovery), and the Preparation Error (i.e., error generated by excessive loss of fines). The "Pitard Protocol" for assaying Troilus diamond drill core is summarized below:

- Crush the entire three metre NQ core sample (14 kg) down to 16 mesh (0.04 in.).
- Split a one kilogram sample using a rotary divider.
- Pulverize the entire one kilogram sample for no longer than 90 seconds to minimize smearing.
- Screen the entire one kilogram sample using a 150 mesh screen.
- Perform as many one-AT fire assay on the +150 mesh fraction as needed to assay the whole +150 fraction.
- Perform two one-AT fire assays on the –150 mesh fraction.
- The final assay value is the weighted average of the results from both fractions.

Starting in 2004, the Pitard Protocol for diamond drill core was adjusted to two metre core length (ten kilograms). The rest of the procedure remained the same.

In 2018, the Pitard Protocol was not used. One metre sawn core was processed with standard crushing to 85% passing 75 microns on 500 g splits. Samples were assayed by one-AT (30 g) fire assay with an AA finish and if results were higher than 3.5 g/t Au, assays were redone with a gravimetric finish. For quality assurance/quality control (QA/QC) samples, a 50 g fire assay was done. In addition to gold, both laboratories carried out multi-element analysis by AA, AGAT for 23 elements and ALS for 33. Troilus retained an external consultant, Jack Stanley of Analytical Laboratory Consultant Ltd., to carry out an audit of both laboratories, who concluded that both facilities were following industry standards.

During the 2019 drill program, one metre assay samples were taken from NQ core and sawed in half. One-half was sent for assaying at ALS, and the other half was retained for results, cross checks, and future reference. This protocol was used for holes TLG-J419-091 to 106. Every sample was processed with standard crushing to 85% passing 75 microns on 500 g splits. Samples were assayed by one-AT (30 g) fire assay with an AA finish and if results were higher than 3.5 g/t Au, assays were redone with a gravimetric finish. For QA/QC samples, a 50 g fire assay was done. In 2019, the third party check assays were done at SGS. In addition



to gold, ALS laboratory carried out multi-element analysis by AA for 33 elements. During the 2019 campaign, a decision was made to use two metres of split NQ core and apply the metallic sieve gold assaying protocol for all core samples. A fine crushing to 70% less than 2 mm was performed. The sample was divided so that 1.2 kg to 1.5 kg was used for analysis. The sample of 1.2 kg to 1.5 kg was then pulverized to 95% passing 106 mesh. Approximately 50 g was recovered for ME-ICP61 analysis of 33 elements by four acid inductively coupled plasma atomic emission spectroscopy (ICP-AES). The remainder of the sample was screened to divide the fraction larger and smaller than 106 mesh. The portion smaller than 106 mesh was analyzed by two fire assays using 50 g aliquots. The entire portion larger than 106 mesh was fully fire assayed. The values were then combined by weighted calculation. Both results were transmitted to Troilus by a certificate certified by the laboratory.

The copper and silver assays are based on a four acid digestion and ICP-AES. A prepared sample (0.25 g) is digested with perchloric, nitric, hydrofluoric, and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by ICP-AES.

In RPA's opinion, the assays that support the Mineral Resource estimate are based on sample preparation and analytical protocols that meet or exceed standard industry practice. The mine laboratory was equipped with modern state-of-the-art equipment and staffed with highly qualified personnel. Established assay laboratories were used for the earlier and more recent 2018 and 2019 drill programs. ALS, SGS, and AGAT have ISO/IEC 17025 and ISO 9001:2015 accreditation.

### QUALITY CONTROL AND QUALITY ASSURANCE

Several laboratories and assay methods were used in the course of the different drilling programs, and a number of re-assay and check assay programs were carried out over the years. Also, several studies on the heterogeneity and/or nugget effect of gold were carried out and are listed in Boily et al. (2008). From 1997 onward, Inmet operated an internal assay laboratory where gold and copper grades were reconciled with head grades from the operating mill.

Prior to 1999, during the assaying process, each laboratory did a systematic check assay every 10 to 15 samples. All samples assaying more than 1.0 g/t Au were re-assayed from a second



pulp and all those assaying greater than 2.0 g/t Au were assayed a second time from the rejects. All assay laboratories routinely inserted in-house reference materials and certified standards.

Since 1993, Inmet had inserted in-house reference materials, CANMET Certified Standards and blanks in each shipment to the assay laboratories. Over 20 different in-house reference materials and Certified Standards were used by Inmet over time. All these in-house control samples were first pulverized and bagged (35 g) and then inserted after every 50 samples using the same sequential numbers as the core samples. After approximately every 10 control samples, a CANMET Certified Standard or a blank was inserted instead of the in-house control sample.

Following the introduction of a new sampling and assay protocol in 1999 (Pitard Protocol), modifications were made to Troilus quality control procedures. In addition to the insertion of reference material and/or Certified Standards, approximately 10% of all the samples assayed were randomly selected and their rejects sent back to the laboratory to be re-assayed using the same assay protocol (duplicates).

Results from quality control programs (reference samples, standards, re-assays, and duplicate assays) are used to qualify reliable assay data. There are no data on the standards used by the off-site laboratories prior to 1993 and/or the results of their quality control. However, no major problems were reported in the assays from the drilling programs and differences between the original values and the second assays and/or duplicates were judged to be acceptable.

In a report dated March 1994, the Coopers & Lybrand Consulting Group compiled the different studies on the accuracy and precision of the assays carried out by Inmet and concluded that the relative accuracy for the gold grade at Troilus is  $\pm 15\%$ . After 1994, a number of tests and studies on the heterogeneity of gold at Troilus were carried out for Inmet by various consulting firms. Pitard (1999) reviewed this work and concluded that a target of  $\pm 15\%$  variance in the gold assay results was achievable and that a sampling protocol modification was required to reduce sampling error to this level.

An internal Inmet report (Boily, 2005), based on external check assays and the mine laboratory gold reference standards, concluded that the Troilus laboratory assays were not biased.



In late 1998 and early 1999, approximately 1,427 m of core from the mineralized zones from 12 holes were re-sampled and assayed in two separate programs. Independent laboratories used for the assaying included SGS Lakefield Research Limited and the Centre de Recherche Minérale. This program was designed to compare the newly introduced 1,000 g screen metallic sampling and assays (Pitard Protocol) with the historical 30 g sampling assay protocol. From this program, Inmet concluded that the relative difference between the two data sets was less than 2% and that there was no overall bias between the two protocols. It was concluded that the 1,000 g screen metallic protocol reduced the sampling error and therefore provided a much better estimate of the gold contained in any given sample and improved the ability to estimate grades locally. This protocol was adopted as the sampling protocol going forward.

In 1997, external check assays at Swastika and Chimitec indicated that the Troilus laboratory was underestimating gold values by approximately 10% to 15%. The Swastika and Chimitec assays were within 5%. The 1997 drilling program targeted Z87 close to the pit limits.

The 2018 and 2019 QA/QC programs were in line with what was done previously. The insertion rates for certified reference material (CRM) and blanks was modified. Troilus has inserted OREAS CRMs and in-house blanks (granite from the Parker Lake intrusion) in each shipment to the assay laboratories. A total of five CRMs have been used by Troilus (OREAS 92, 922, 209, 215, and 217). All the CRMs are individually packaged in 30 g envelopes and then randomly inserted within the 25 sample batches using the same sequential numbers as the core samples. Blanks are either granite drill core coming from end of holes or broken rock coming from an outcrop located well inside the Parker Lake granite. They are also inserted within 25 sample batches.

Tables 11-1 and 11-2 summarize the insertion rates of QA/QC samples for the 2018 and 2019 drilling programs, respectively. The insertion ratios have been defined by RPA based on its historic knowledge of the Project. The 2018 third-party check assays are on pulps from the primary laboratory that are re-assayed by a third party laboratory, i.e., AGAT pulps were re-assayed by ALS and vice versa. In 2019, ALS was the primary laboratory and SGS was used for the third party check assays.

RPA is of the opinion that the check assay data do not reveal any major biases in the historical Troilus drilling program gold assays that could have a significant negative effect on the Troilus



Mineral Resource grade estimates. Overall, past production data reconciled well with the previous resource models.

	No.		No.	No.	No.	Laboratory	Ratio	Ratio		Labo	Laboratory Re-Assay		Third
Area	Holes	Metres	Assays	Standards	Blanks	Used	Standards	Blanks	Area	Pulp (1%)	Reject (1%)	Core (1%)	Party Pulp (2%)
Z87	32	21,844	13,704	608	616	AGAT	4.4%	4.5%	Z87	137	137	137	274
Z87S	11	2,207	1,986	83	84	AGAT/ALS	4.2%	4.2%	Z87S	20	20	20	40
J4	33	9,041	7,956	344	344	ALS	4.3%	4.3%	J4	80	80	80	160
J5	14	3,285	3,170	143	141	AGAT	4.5%	4.4%	J5	32	32	32	64
Total	90	36,377	26,816	1,178	1,185		4.4%	4.4%	Total	269	269	269	538

 TABLE 11-1
 2018 DRILLING QA/QC INSERTION RATES

 Troilus Gold Corp. – Troilus Gold-Copper Mine

Data from RPA (2019) and is compilation for first 90 of the 112 drill holes drilled in 2018.

<b>TABLE 11-2</b>	2019	DRILLING QA/QC INSERTION RATE
Troilu	s Gold	Corp Troilus Gold-Copper Mine

								Lab R	e-Assay	Thire	d Party
No. Holes	Metres	No. Assays	<b>No Standards</b>	No Blanks	Lab Used	Ratio Standard %	Ratio Blanks %	Pulp	Reject	Pulp	Reject
84	35982	19134	868	847	ALS	4.5	4.4	63	272	63	392



## **12 DATA VERIFICATION**

In 2003, Inmet and RPA personnel did extensive work together to validate and verify the original Z87 Gemcom diamond drill hole database which was used to estimate the January 2003 open pit Z87 Mineral Resources and Mineral Reserves. Approximately 10% of all the Z87 assays available in 2003 were verified with the original assay certificates. No significant data entry problems were found.

In January 2004, the Gemcom header, survey, and assay data related to the 50 new drill holes were verified. A number of minor data entry problems in the header, survey, and assay tables were identified and corrected.

Inmet and RPA personnel also worked together to validate and verify the Z87 underground Gemcom diamond drill hole database, which was used for the April 2006 underground Z87 Mineral Resources and Mineral Reserves (Evans, 2006).

Inmet and RPA used a number of queries in MS Access, the Gemcom data validation routine, and 3D visual inspection to validate the drill hole database header, survey, and assay tables. A number of minor data entry problems in the survey and assay tables were identified and corrected.

The lithology table data has not been validated because the resource model has not required a lithology-based block model. RPA notes that the rock code nomenclature needs to be standardized and overlapping primary and secondary rock codes in the lithology table should be rectified in the future. RPA believes that the current state of the lithology table will not have a material impact on the Mineral Resource estimates.

Mr. Bernard Boily, Inmet Senior Mine Geologist, verified all of the Troilus UG drill hole database header and survey records, and most of the assay records (Boily, 2005). No significant data entry problems were found. All of the assay results are provided by the mine laboratory in digital format. The downhole survey results are also generated directly in digital format. RPA checked the resource assays in four drill holes (KN-653, KN-661, KN-666, and KN-673) and found no errors.





In 2018, Troilus retrieved the historic GEMS database. Before the grade interpolation step was initiated, a complete new and clean database was created by Troilus personnel. A complete review of the dataset was carried out including running a number of queries in MS Access and the GEMS data validation routine and carrying out 3D visual inspection to validate the drill hole database header, survey, and assay tables. A small number of minor data entry issues in the survey and assay tables were identified and corrected. No major issues were encountered.

Troilus staff carried out an in-house validation of the 2018 dataset before providing the data to RPA. Approximately 10% of the dataset was checked against the assay certificates and no major issues were found.

Troilus staff carried out an in-house validation of the 2019 dataset before providing the data to RPA. Approximately 5% of the dataset was checked against the assay certificates and no major issues were found.

RPA ran a set of database validation checks in GEMS, specific database validation queries in MS Access, and carried out visual 3D validation checks and found no significant issues with the drill hole database. RPA is of the opinion that the drill hole database is acceptable to support the Mineral Resource estimate.



## 13 MINERAL PROCESSING AND METALLURGICAL TESTING

The mill was originally designed to treat gold, copper, and silver at a rate of 10,000 tpd using a flowsheet consisting of a gravimetric, flotation, and cyanidation circuit. Copper concentrate and doré bars were produced on site. The Troilus mill was commissioned in 1996, with commercial production achieved in April 1997 at a rate of 10,000 tpd, with recoveries of 86% Au and 90% Cu and a concentrate grade of 18% Cu. At the end of 1998, the plant reached production of 10,850 tpd with similar metallurgical results.

At the beginning of 1998, a decision was made to increase mill capacity to 15,000 tpd using a coarser grind. A crushing and screening plant was constructed and became operational in early 1999. The objective was to reduce the critical size material in the feed down to less than two inches. The cyanidation portion of the flowsheet was dropped in 1999, since it was found to be uneconomic. Removing the cyanidation circuit decreased the gold recovery by 2%, while coarser grind was responsible for approximately a 1% to 1.5% decrease. Since 1999, the plant has been operational with gold recoveries in the 82.5% to 84% range.

At the end of 2001, after replacement of the pebble crusher and ball mill pump and the successful implementation of instrumentation upgrade and flowsheet changes, the plant reached its target tonnage capacity. Similarly, steps were undertaken in 2000 to improve copper metallurgy, particularly concentrate grade. A column cell was commissioned, and modifications were carried out to the copper cleaner and thickening circuit. These changes led to improvements in the concentrate grade by 3% copper and recovery improvements by 1% to 2%. More importantly, this permitted the mill to operate more efficiently in a wider range of copper feed grades.

Plant recoveries in 2005 were approximately 82% for gold and 90% for copper (Figure 13-1 and Table 13-1). In 2004, the plant reached a new milestone of 18,000 tpd.



#### FIGURE 13-1 HISTORICAL GOLD AND COPPER MILL RECOVERIES



# TABLE 13-12005 METALLURGY SUMMARYTroilus Gold Corp. – Troilus Gold-Copper Project

Motorial	Maight 0/	Ass	says	Distribution		
Material	Weight %	(%Cu)	(g/t Au)	(%Cu)	(%Au)	
Mill Feed	100	0.07	0.98	100	100	
Concentrate	0.40	17.33	128.76	89.68	54.43	
Gravity					27.36	
Final Tails	99.60	0.008	0.17	10.32	18.21	

#### CRUSHING

The run-of-mine ore was hauled by 150 t trucks and dumped directly to a 54 in. x 74 in. gyratory AC crusher. Prior to crushing, large blocks were broken by a rock hammer in the crusher chamber to less than 1.2 m. The product from the crusher at 100% -200 mm was temporarily accumulated in a pocket, which is fed to a conveyor through an apron feeder. The dust generated in the crushing area is controlled by three dust collectors. Crushed material was conveyed to a dual deck vibrating screen to remove the +2 in. and -7 in. size fraction for secondary crushing. Pre-crusher discharge was then returned to the screen oversize and undersize fractions and conveyed to the coarse ore stockpile.



#### GRINDING

The reclaim circuit was supplied by three variable speed belt feeders located under the stockpile. The disposition of the belt feeders minimized the segregation effect on the stockpile by feeding the conveyor of the semi-autogenous grinding (SAG) mill with a relatively stable ratio of fine particles.

The SAG mill (30 ft x 13 ft) was driven by a 7,000 hp fixed speed synchronous motor, which was operational in a bi-directional mode. The mill was lined with chrome-molybdenum steel.

The mill was typically operated with a 20% to 25% volume using a steel charge of 10% to 12% 5.25 in. grinding balls. Grate discharge at 2.5 in. overflowed on a dual deck vibrating screen. The +12 mm screen oversize was recycled to the pebble crusher by conveyor. Pebble crusher discharge was added to the SAG mill feed conveyor. The -12 mm screen undersize was pumped to the ball mill circuit. This operation was carried out to relieve the mill of critical sized material.

The primary ball mill (18 ft x 28.5 ft) was driven by a 6,000 hp synchronous motor that was in closed circuit (450% C.L.) with a cluster of 26 in. cyclones. The primary cyclone overflow fed the secondary ball mill circuit. This ball mill (16 ft by 22 ft), driven by a 4,300 hp synchronous motor, was in closed circuit (250% C.L.) with a cluster of 15 in. cyclones. The product (80% passing 90  $\mu$ m) fed the flotation circuit.

### **GRAVITY CONCENTRATION**

A 15% bleed of primary ball mill circulating load fed a gravimetric circuit consisting of four 30 in. Knelson concentrators. Screen feed at 2,000 µm was supplied to the Knelson concentrators on three hour cycles. The concentrate from the Knelson concentrators was accumulated in a storage tank to be later fed to a magnetic separator and further upgraded on a Gemini table. Middlings from the Gemini table were fed in a 12 in. closed circuit Knelson. Gold concentrates were produced at 40% Au to 70% Au and refined in an induction furnace. The gravimetric circuit generally recovered 24% Au to 32% Au.



### **FLOTATION**

The overflow from the secondary cyclones went to rougher column flotation before supplying two parallel banks of 43 m<sup>3</sup> flotation cells (GL&V). Each bank had seven cells in a 2+2+3 arrangement. The seven cells operated as a bulk sulphide flotation. The collection was done in an alkaline (pH 10.0) circuit.

The floating sulphides containing gold and copper from the flash flotation cell, the rougher column flotation, and the rougher/scavenger cells were further liberated in a regrind mill (10.5 ft x 12 ft). This 600 HP regrind mill was in closed circuit with a cluster of 10 in. cyclones. Cleaner circuit feed was typically 89% passing 40  $\mu$ m. A Falcon concentrator was fed by one cyclone underflow to recover the fine free gold before feeding the cleaning circuit. Cleaning circuit pH was maintained at 10.5 to 11 to depress pyrite.

The cleaning circuit was comprised of four stages. The first and second stages had five cells of 2.8 m<sup>3</sup>, the third stage had four cells of 1.4 m<sup>3</sup>, and the fourth stage was a column flotation. Concentrate from the column was typically 22% and was shipped as final concentrate.

### **ON-STREAM ANALYZER**

At the beginning of 1998, an on-stream analyzer (Courier 30 AP) was purchased in order to improve the flotation control and copper concentrate grade. Six streams were analyzed for process control. Better control permitted an increase of 1% to 2% in concentrate grade.

### FILTERING

The copper concentrate was filtered by a pressure filter. The filter was a 25 m<sup>2</sup> Larox that produced a concentrate with less than 8% humidity. It was stored in a 400 t capacity bunker and shipped to Chibougamau by truck and further to the Horne Smelter by rail. Production was typically 2,500 t per month.



## TAILINGS DISPOSAL

The pond was constructed with a 2.5 km till starter dike. Winter discharge was done linearly with a single high spot. Beaches were produced in the summer by spigotting along the dike and were further raised with a granular material on a yearly basis, with follow-up spigotting.

A water treatment plant has been functional since the end of 1998, after initial operation revealed suspended solid control problems. It uses a new technology (ACTIFLO) based on polymer addition and agitation followed by high speed sand assisted lamellar decantation and reduces suspended solids to concentrations below 15 ppm, the monthly average regulation limit.



# 14 MINERAL RESOURCE ESTIMATE

#### SUMMARY

The current resource estimate for Troilus includes open pit resources for Z87, J4, and J5, and underground resources for Z87. The estimate is prepared using a Geovia GEMS version 6.8.1 block model with blocks measuring 5 m by 5 m by 5 m in size. The Mineral Resources are estimated using three dimensional (3D) mineralized wireframes. A resource pit shell was used to assist in reporting of the open pit resources. The underground resources are reported below the resource pit shell for Z87 at a higher cut-off grade, from mineralized areas with contiguous blocks above the underground cut-off grade.

The combined open pit and underground Mineral Resource estimate for the Project has an effective date of October 31, 2019 and is summarized in Table 14-1. Mineral Resources conform to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions). No Mineral Reserves have been estimated for the Project.

# TABLE 14-1 MINERAL RESOURCE ESTIMATE AS OF OCTOBER 31, 2019 Troilus Gold Corp. – Troilus Gold-Copper Project

Classification	Tonnes (Mt)	Au (g/t)	Cu (%)	Ag (g/t)	AuEq (g/t)	Contained Gold (Moz)	Contained Copper (MIb)	Contained Silver (Moz)	Contained AuEq (Moz)
Indicated	159.1	0.78	0.09	1.19	0.92	3.97	301.2	6.07	4.71
Inferred	52.7	0.90	0.08	1.01	1.04	1.53	94.9	1.71	1.76

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.

 Open pit Mineral Resources were estimated at a cut-off grade of 0.3 g/t gold equivalent (AuEq) and were constrained by a Whittle pit shell. Underground Mineral Resources were estimated at a cut-off grade of 0.9 g/t AuEq.

3. Mineral resources were estimated using long-term metal prices of US\$1,400 per ounce gold, US\$3.25 per pound copper, and US\$20 per ounce of silver; and an exchange rate of US\$1.00 = C\$1.25.

4. Z87 Zone gold equivalent was calculated with formula AuEq = Au grade + 1.546 \* Cu grade + 0.01 \* Ag grade, and the J Zone (J4-J5) gold equivalent was calculated with formula AuEq = Au grade + 1.47 \* Cu grade + 0.013 \* Ag grade.

5. A recovery of 83% for gold, 92% for copper, and 76% for silver was used at the Z87 Zone; a recovery of 82% for gold, 88% for copper, and 76% for silver was used at the J Zone (J4-J5).

RPA is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.



#### **OPEN PIT MINERAL RESOURCES**

The Z87, J4, and J5 open pit Mineral Resource estimate as of October 31, 2019, is summarized in Table 14-2. The resources are reported at a 0.3 g/t AuEq cut-off grade and are constrained by a Whittle pit shell.

RPA estimates the open pit Indicated Mineral Resources to total 140.8 Mt grading 0.67 g/t Au, 0.08% Cu, and 1.19 g/t Ag containing 3.02 Moz of gold, 242.7 Mlb of copper, and 5.39 Moz of silver. In addition, open pit Inferred Mineral Resources were estimated to be 36.2 Mt grading 0.56 g/t Au, 0.06% Cu, and 1.17 g/t Ag containing 0.66 Moz of gold, 51.3 Mlb of copper, and 1.36 Moz of silver.

#### UNDERGROUND MINERAL RESOURCES

The Z87 underground Mineral Resource estimate as of October 31, 2019, is summarized in Table 14-2. Blocks above 0.9 g/t AuEq, located below the pit shell in Z87 area, and in zones of contiguous higher grades were included in the Z87 underground resource.

RPA estimates the underground Indicated Mineral Resources total 18.3 Mt grading 1.62 g/t Au, 0.15% Cu, and 1.16 g/t Ag containing 0.95 Moz of gold, 58.5 Mlb of copper, and 0.68 Moz of silver. In addition, underground Inferred Resources were estimated to be 16.6 Mt grading 1.63 g/t Au, 0.12% Cu, and 0.67 g/t Ag containing 0.87 Moz of gold, 43.6 Mlb of copper, and 0.36 Moz of silver.



# TABLE 14-2OPEN PIT AND UNDERGROUND MINERAL RESOURCES –<br/>OCTOBER 31, 2019

Zone	Tonnes (Mt)	Au (g/t)	Cu (%)	Ag (g/t)	AuEq (g/t)	Contained Gold (Moz)	Contained Copper (MIb)	Contained Silver (Moz)	Contained AuEq (Moz)
Total Open	Pit and Und	erground	I						
Indicated	159.06	0.78	0.09	1.19	0.92	3.97	301.15	6.07	4.71
Inferred	52.74	0.90	0.08	1.01	1.04	1.53	94.89	1.71	1.76
Open Pit									
Pit Z87									
Indicated	63.83	0.78	0.09	1.41	0.94	1.60	130.58	2.89	1.92
Inferred	12.62	0.59	0.06	1.48	0.70	0.24	17.11	0.60	0.29
Pit J4-J5									
Indicated	76.95	0.57	0.07	1.01	0.68	1.42	112.12	2.50	1.69
Inferred	23.55	0.55	0.07	1.00	0.66	0.41	34.19	0.75	0.50
Total Open	Pit								
Indicated	140.78	0.67	0.08	1.19	0.80	3.02	242.70	5.39	3.61
Inferred	36.17	0.56	0.06	1.17	0.67	0.66	51.30	1.36	0.78
Undergroun	d Z87								
Indicated	18.28	1.62	0.15	1.16	1.86	0.95	58.45	0.68	1.09
Inferred	16.57	1.63	0.12	0.67	1.82	0.87	43.60	0.36	0.97

Troilus Gold Corp. – Troilus Gold-Copper Project

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.

2. Open pit Mineral Resources were estimated at a cut-off grade of 0.3 g/t gold equivalent (AuEq) and were constrained by a Whittle pit shell. Underground Mineral Resources were estimated at a cut-off grade of 0.9 g/t AuEq.

3. Mineral resources were estimated using long-term metal prices of US\$1,400 per ounce gold, US\$3.25 per pound copper, and US\$20 per ounce of silver; and an exchange rate of US\$1.00 = C\$1.25.

4. Z87 Zone gold equivalent was calculated with formula AuEq = Au grade + 1.546 \* Cu grade + 0.01 \* Ag grade, and the J Zone (J4-J5) gold equivalent was calculated with formula AuEq = Au grade + 1.47 \* Cu grade + 0.013 \* Ag grade.

5. A recovery of 83% for gold, 92% for copper, and 76% for silver was used at the Z87 Zone; a recovery of 82% for gold, 88% for copper, and 76% for silver was used at the J Zone (J4-J5).



### **RESOURCE DATABASES**

The Troilus drill hole database for Z87, J4, and J5 comprises 805 surface diamond drill holes with a total length of 199,225.7 m. There are 80 new drill holes from 2019 totalling 35,217 m available for this resource estimate update. There are 115,120 assay records totalling 149,313 m sampled. This includes historical drilling performed until 2006 and data from the 2018 and 2019 drilling campaigns. Some 40,713 samples from 699 holes are used in the resource estimate. The Z87 wireframes capture data from 433 holes, while samples for J4 and J5 were collected from 266 holes.

### **GEOLOGICAL INTERPRETATION AND 3D SOLIDS**

The open pit and underground resources for the Z87 zone are based on mineralization wireframes built at nominal cut-off grades of 0.3 g/t AuEq and 0.8 g/t AuEq, respectively. The open pit resources at the J zones are based on mineralization wireframes built at approximately 0.3 g/t AuEq. A minimum thickness of approximately four metres was used to build all of the mineralization wireframes.

The wireframes were built by Troilus personnel using 3D wobbly polylines that were snapped on to the drill hole sample intervals on sections spaced 25 m apart. The polylines were then joined together using tie lines in order to create 3D solids. The mineralized wireframes start above topographic surface and extend approximately 900 m vertically for Z87 and approximately 400 m to 600 m vertically for J4-J5. The Z87 wireframes have a 2,000 m strike length. The J4-J5 wireframes have a 1,700 m strike length. The Project maintained the local mine grid reference system and the wireframes extend from approximately 12,300 m to 5,600 m northing, 9,200 m to 10,500 m easting, and 5,400 m to 4,500 m elevation.

Figure 14-1 shows the mineralized wireframes grouped by general area and the existing drilling.





### **RESOURCE ASSAYS**

The Project drill hole database includes all of the Z87, J4, and J5 drill holes, as well as several distant exploration drill holes. The resource assays represent the samples captured inside the mineralization wireframes. There are a total of 31 mineralization wireframes or domains, including three high grade wireframes at Z87 (Domains 1001 to 1003). Tables 14-3 to 14-5 present the gold, copper, and silver assay descriptive statistics, respectively, by mineralized lens. No length weighting was applied.

Zone	Domain	Gold Resource Assays (g/t Au)											
Zone	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation					
	40	319	0.00	3.12	0.334	0.230	0.363	1.086					
	41	3,621	0.00	30.29	0.581	0.329	1.254	2.155					
	42	4,890	0.00	94.13	0.874	0.420	2.496	2.854					
J4	43	2,159	0.00	28.69	0.699	0.376	1.320	1.888					
54	44	343	0.00	4.74	0.504	0.320	0.589	1.168					
	45	202	0.00	7.91	0.345	0.240	0.591	1.711					
	46	150	0.00	3.08	0.520	0.345	0.526	1.011					
	47	167	0.00	6.45	0.503	0.292	0.763	1.515					
	50	711	0.00	20.84	0.444	0.280	0.911	2.051					
	51	488	0.00	8.05	0.564	0.308	0.887	1.573					
J5	52	101	0.00	0.79	0.177	0.140	0.136	0.767					
	54	2,038	0.00	15.40	0.407	0.244	0.678	2.019					
	55	89	0.02	5.88	0.421	0.250	0.723	1.716					
	1001	5,987	0.00	103.01	1.645	1.020	3.088	1.877					
	1002	430	0.00	32.35	1.645	0.940	2.716	1.651					
	1003	78	0.04	10.69	2.114	1.165	2.495	1.180					
	11	6,406	0.00	36.70	0.557	0.348	1.000	1.797					
Z87	12	399	0.00	10.70	0.437	0.250	0.841	1.925					
	16	223	0.00	13.90	0.332	0.190	1.004	3.027					
	18	298	0.00	29.07	0.808	0.290	2.130	2.638					
	20	1,621	0.00	19.94	0.622	0.360	0.946	1.521					
	21	288	0.00	4.07	0.531	0.363	0.558	1.052					
	13	4,249	0.00	133.70	0.821	0.324	3.688	4.493					
	14	2,842	0.00	87.40	0.794	0.360	2.449	3.086					
	15	26	0.03	1.81	0.551	0.345	0.518	0.939					
707/	17	1,907	0.00	35.04	0.630	0.300	1.650	2.620					
Z87/ Z87S	19	194	0.00	17.68	0.703	0.327	1.634	2.324					
2013	22	76	0.00	3.09	0.356	0.238	0.413	1.161					
	23	34	0.00	2.62	0.472	0.287	0.566	1.199					
	24	34	0.03	1.49	0.403	0.320	0.364	0.904					
	25	343	0.00	12.20	0.544	0.311	0.907	1.667					

#### TABLE 14-3 GOLD RESOURCE ASSAY STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project


## TABLE 14-4 COPPER RESOURCE ASSAY STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project

Zone	Domain	Copper Resource Assays (% Cu)									
Zone	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation			
	40	319	0.00	0.44	0.063	0.050	0.060	0.951			
	41	3,621	0.00	2.01	0.065	0.048	0.075	1.159			
	42	4,890	0.00	1.37	0.046	0.034	0.050	1.102			
J4	43	2,159	0.00	3.91	0.054	0.036	0.100	1.841			
J4	44	343	0.00	0.51	0.072	0.051	0.072	0.994			
	45	202	0.00	0.37	0.092	0.084	0.062	0.672			
	46	150	0.00	0.64	0.093	0.041	0.117	1.263			
	47	167	0.00	0.09	0.021	0.018	0.017	0.855			
	50	711	0.00	0.43	0.055	0.043	0.041	0.886			
	51	488	0.00	0.64	0.053	0.037	0.056	1.064			
J5	52	101	0.00	0.50	0.135	0.112	0.093	0.690			
	54	2,038	0.00	0.85	0.066	0.052	0.060	0.916			
	55	89	0.01	0.25	0.078	0.071	0.052	0.666			
	1001	5,987	0.00	9.58	0.161	0.100	0.240	1.496			
	1002	430	0.00	2.89	0.214	0.139	0.256	1.195			
	1003	78	0.01	1.05	0.138	0.091	0.166	1.203			
	11	6,406	0.00	3.33	0.064	0.037	0.101	1.588			
Z87	12	399	0.00	0.75	0.095	0.058	0.103	1.085			
	16	223	0.00	1.01	0.090	0.068	0.099	1.095			
	18	298	0.00	0.29	0.034	0.021	0.042	1.220			
	20	1,621	0.00	0.83	0.037	0.020	0.054	1.461			
	21	288	0.00	0.20	0.024	0.013	0.031	1.275			
	13	4,249	0.00	10.00	0.103	0.044	0.235	2.274			
	14	2,842	0.00	0.92	0.050	0.030	0.064	1.296			
	15	26	0.01	0.14	0.045	0.033	0.035	0.766			
707/	17	1,907	0.00	11.27	0.077	0.029	0.300	3.884			
Z87/ Z87S	19	194	0.00	2.00	0.044	0.023	0.147	3.339			
2010	22	76	0.01	0.36	0.086	0.064	0.073	0.855			
	23	34	0.01	0.19	0.049	0.042	0.041	0.832			
	24	34	0.00	0.14	0.030	0.020	0.027	0.883			
	25	343	0.00	0.83	0.033	0.018	0.061	1.871			



TABLE 14-5 SIL	VER RESOURCE ASSAY STATISTICS
Troilus Gold	Corp. – Troilus Gold-Copper Project

Zone	Domain	Silver Resource Assays (g/t Ag)								
Lono	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation		
	40	319	0.00	6.00	0.638	0.400	0.701	1.097		
	41	3,621	0.00	46.90	1.106	0.800	1.491	1.348		
	42	4,890	0.00	206.00	0.913	0.600	3.152	3.450		
J4	43	2,159	0.00	62.80	1.057	0.700	1.757	1.661		
J4	44	343	0.00	7.30	1.343	1.000	1.241	0.924		
	45	202	0.00	8.60	0.781	0.600	0.831	1.061		
	46	150	0.00	11.60	1.489	0.700	1.852	1.243		
	47	167	0.00	2.00	0.357	0.250	0.272	0.762		
	50	711	0.00	12.20	0.873	0.600	1.012	1.159		
	51	488	0.00	4.60	0.526	0.300	0.584	1.109		
J5	52	101	0.00	2.40	0.617	0.600	0.435	0.704		
	54	2,038	0.00	15.40	0.815	0.600	0.937	1.150		
	55	89	0.10	3.70	0.755	0.250	0.769	1.018		
	1001	5,987	0.00	109.50	1.514	0.800	3.692	2.439		
	1002	430	0.00	52.00	3.233	1.400	6.042	1.869		
	1003	78	0.00	4.13	0.240	0.000	0.635	2.646		
	11	6,406	0.00	259.90	0.915	0.464	3.698	4.042		
Z87	12	399	0.00	15.10	2.118	1.400	2.437	1.151		
	16	223	0.00	11.30	1.326	0.900	1.580	1.192		
	18	298	0.00	9.50	0.608	0.300	0.995	1.636		
	20	1,621	0.00	253.56	0.702	0.200	6.418	9.148		
	21	288	0.00	12.20	0.531	0.200	1.016	1.914		
	13	4,249	0.00	122.00	1.158	0.400	3.705	3.200		
	14	2,842	0.00	159.54	1.324	0.700	3.599	2.718		
	15	26	0.25	7.20	1.275	0.950	1.469	1.152		
707/	17	1,907	0.00	59.20	1.103	0.559	2.308	2.092		
Z87/ Z87S	19	194	0.00	39.20	1.127	0.648	2.918	2.588		
20/0	22	76	0.25	7.70	1.389	1.100	1.277	0.920		
	23	34	0.25	2.30	0.779	0.700	0.560	0.718		
	24	34	0.25	5.70	1.796	1.450	1.527	0.851		
	25	343	0.00	14.50	0.651	0.348	1.112	1.708		



#### CAPPING LEVELS

Historically, all high grade gold resource assays at Z87 have been capped to 6.0 g/t Au prior to compositing. High grade copper assays are rare and copper assays have not historically been capped at Troilus. Reconciliation work in 2003 and 2004 indicated that the 6.0 g/t Au capping level was appropriate, however, RPA considers the 6.0 g/t Au capping level to be conservative for higher grade areas such as the deeper parts of Z87. Accordingly, a gold and silver assay capping strategy by mineralized lens was used for the current estimate. No capping was applied to copper assays. Gold and silver assays were capped before compositing. Table 14-6 presents the selected gold and silver capping levels by domain. Descriptive statistics for capped gold and silver assays are presented in Tables 14-7 and 14-8, respectively.

# TABLE 14-6 SELECTED GOLD AND SILVER CAP VALUES FOR EACH DOMAIN

Zone	Domain	Сар	Сар
20110	Domain	(g/t Au)	(g/t Ag)
	40	2	3.00
	41	8	9.00
	42	14	9.00
J4	43	8	9.00
J4	44	-	6.00
	45	2	3.00
	46	-	6.00
	47	3	1.00
	50	4	6.00
	51	-	-
J5	52	-	-
	54	7	8.00
	55	3	-
	1001	26	20.00
	1002	26	20.00
	1003	-	-
	11	10	15.00
Z87	12	5	10.00
	16	5	-
	18	8	-
	20	7	10.00
	21	-	-

Troilus Gold Corp. – Troilus Gold-Copper Project



Zone	Domain	Cap (g/t Au)	Cap (g/t Ag)
	13	20	20.00
	14	15	15.00
	15	-	-
	17	10	12.00
Z87/Z87S	19	6	10.00
	22	-	-
	23	-	-
	24	-	-
	25	5	10.00

### TABLE 14-7 CAPPED GOLD RESOURCE ASSAY STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project

Zone	Domain	Capped Gold Resource Assays (g/t Au)							
		Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation	
	40	319	0.00	2.00	0.329	0.230	0.334	1.015	
	41	3621	0.00	8.00	0.551	0.329	0.812	1.473	
	42	4890	0.00	14.00	0.811	0.420	1.364	1.681	
J4	43	2159	0.00	8.00	0.669	0.376	0.961	1.435	
J4	44	343	0.00	4.74	0.504	0.320	0.589	1.168	
	45	202	0.00	2.00	0.313	0.240	0.264	0.844	
	46	150	0.00	3.08	0.520	0.345	0.526	1.011	
	47	167	0.00	3.00	0.472	0.292	0.578	1.224	
	50	711	0.00	4.00	0.418	0.280	0.498	1.190	
	51	488	0.00	8.05	0.564	0.308	0.887	1.573	
J5	52	101	0.00	0.79	0.177	0.140	0.136	0.767	
	54	2038	0.00	7.00	0.407	0.244	0.823	2.019	
	55	89	0.02	3.00	0.421	0.250	0.723	1.716	
	1001	5987	0.00	26.00	1.596	1.020	2.277	1.427	
	1002	430	0.00	26.00	1.630	0.940	2.561	1.571	
	1003	78	0.04	10.69	2.114	1.165	2.495	1.180	
	11	6406	0.00	10.00	0.545	0.348	0.754	1.383	
Z87	12	399	0.00	5.00	0.412	0.250	0.607	1.471	
	16	223	0.00	5.00	0.292	0.190	0.524	1.797	
	18	298	0.00	8.00	0.719	0.290	1.287	1.790	
	20	1621	0.00	7.00	0.612	0.360	0.814	1.330	
	21	288	0.00	4.07	0.531	0.363	0.558	1.052	
	13	4249	0.00	20.00	0.714	0.324	1.628	2.280	
	14	2842	0.00	15.00	0.740	0.360	1.371	1.853	
	15	26	0.03	1.81	0.551	0.345	0.518	0.939	
	17	1907	0.00	10.00	0.583	0.300	1.062	1.821	
Z87/ Z87S	19	194	0.00	6.00	0.615	0.327	0.928	1.509	
2013	22	76	0.00	3.09	0.356	0.238	0.413	1.161	
	23	34	0.00	2.62	0.472	0.287	0.566	1.199	
	24	34	0.03	1.49	0.403	0.320	0.364	0.904	
	25	343	0.00	5.00	0.523	0.311	0.695	1.328	



## TABLE 14-8 CAPPED SILVER RESOURCE ASSAY STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project

		Capped Silver Resource Assays (g/t Ag)							
Zone	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation	
	40	319	0.00	3.00	0.616	0.400	0.592	0.960	
	41	3,621	0.00	9.00	1.078	0.800	1.099	1.019	
	42	4,890	0.00	9.00	0.861	0.600	0.864	1.003	
J4	43	2,159	0.00	9.00	1.027	0.700	1.116	1.086	
J4	44	343	0.00	6.00	1.333	1.000	1.199	0.899	
	45	202	0.00	3.00	0.742	0.600	0.579	0.779	
	46	150	0.00	6.00	1.412	0.700	1.569	1.111	
	47	167	0.00	1.00	0.352	0.250	0.249	0.708	
	50	711	0.00	6.00	0.861	0.600	0.921	1.069	
	51	488	0.00	4.60	0.526	0.300	0.584	1.109	
J5	52	101	0.00	2.40	0.617	0.600	0.435	0.704	
	54	2,038	0.00	8.00	0.815	0.600	0.937	1.150	
	55	89	0.10	3.70	0.755	0.250	0.769	1.018	
	1001	5,987	0.00	20.00	1.409	0.800	2.115	1.500	
	1002	430	0.00	20.00	2.868	1.400	4.031	1.405	
	1003	78	0.00	4.13	0.240	0.000	0.635	2.646	
	11	6,406	0.00	15.00	0.850	0.464	1.395	1.641	
Z87	12	399	0.00	10.00	2.099	1.400	2.361	1.125	
	16	223	0.00	11.30	1.326	0.900	1.580	1.192	
	18	298	0.00	9.50	0.608	0.300	0.995	1.636	
	20	1,621	0.00	10.00	0.525	0.200	1.011	1.925	
	21	288	0.00	12.20	0.531	0.200	1.016	1.914	
	13	4,249	0.00	20.00	1.068	0.400	2.108	1.974	
	14	2,842	0.00	15.00	1.248	0.700	1.772	1.420	
	15	26	0.25	7.20	1.275	0.950	1.469	1.152	
Z87/	17	1,907	0.00	12.00	1.047	0.559	1.608	1.535	
Z87S	19	194	0.00	10.00	0.977	0.648	1.178	1.206	
	22	76	0.25	7.70	1.389	1.100	1.277	0.920	
	23	34	0.25	2.30	0.779	0.700	0.560	0.718	
	24	34	0.25	5.70	1.796	1.450	1.527	0.851	
	25	343	0.00	10.00	0.638	0.348	0.965	1.513	



#### COMPOSITING

The assays situated within the mineralization wireframe were composited to two metre lengths starting at the first mineralization wireframe boundary from the collar and resetting at each new wireframe boundary. Composites shorter than 0.5 m generated adjacent to wireframe boundaries were discarded.

The Z87 composites average 1.96 m in length. Approximately 4% of the composites have lengths that are less than two metres, including 0.5% with lengths that are less than 0.50 m.

The J4 and J5 composites average 1.97 m in length. Approximately 4% of the composites have lengths that are less than two metres, including a small number with lengths that are less than 0.50 m.

Composite statistics for Z87 and J4-J5 are shown in Table 14-9 for gold, Table 14-10 for copper, and Table 14-11 for silver.



## TABLE 14-9 CAPPED GOLD COMPOSITES – DESCRIPTIVE STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project

Zone	Domain	Capped Gold Composites (g/t Au)							
Zone	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation	
	40	319	0.00	2.00	0.329	0.230	0.334	1.015	
	41	3621	0.00	8.00	0.551	0.329	0.812	1.473	
	42	4890	0.00	14.00	0.811	0.420	1.364	1.681	
J4	43	2159	0.00	8.00	0.669	0.376	0.961	1.435	
54	44	343	0.00	4.74	0.504	0.320	0.589	1.168	
	45	202	0.00	2.00	0.313	0.240	0.264	0.844	
	46	150	0.00	3.08	0.520	0.345	0.526	1.011	
	47	167	0.00	3.00	0.472	0.292	0.578	1.224	
	50	711	0.00	4.00	0.418	0.280	0.498	1.190	
	51	488	0.00	8.05	0.564	0.308	0.887	1.573	
J5	52	101	0.00	0.79	0.177	0.140	0.136	0.767	
	54	2038	0.00	7.00	0.407	0.244	0.823	2.019	
	55	89	0.02	3.00	0.421	0.250	0.723	1.716	
	1001	5987	0.00	26.00	1.596	1.020	2.277	1.427	
	1002	430	0.00	26.00	1.630	0.940	2.561	1.571	
	1003	78	0.04	10.69	2.114	1.165	2.495	1.180	
	11	6406	0.00	10.00	0.545	0.348	0.754	1.383	
Z87	12	399	0.00	5.00	0.412	0.250	0.607	1.471	
	16	223	0.00	5.00	0.292	0.190	0.524	1.797	
	18	298	0.00	8.00	0.719	0.290	1.287	1.790	
	20	1621	0.00	7.00	0.612	0.360	0.814	1.330	
	21	288	0.00	4.07	0.531	0.363	0.558	1.052	
	13	4249	0.00	20.00	0.714	0.324	1.628	2.280	
	14	2842	0.00	15.00	0.740	0.360	1.371	1.853	
	15	26	0.03	1.81	0.551	0.345	0.518	0.939	
	17	1907	0.00	10.00	0.583	0.300	1.062	1.821	
Z87/ Z87S	19	194	0.00	6.00	0.615	0.327	0.928	1.509	
2013	22	76	0.00	3.09	0.356	0.238	0.413	1.161	
	23	34	0.00	2.62	0.472	0.287	0.566	1.199	
	24	34	0.03	1.49	0.403	0.320	0.364	0.904	
	25	343	0.00	5.00	0.523	0.311	0.695	1.328	



Zone	Domain	Copper Composites (% Cu)									
Zone	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation			
	40	217	0.00	0.33	0.064	0.052	0.050	0.780			
	41	2560	0.00	2.01	0.063	0.050	0.069	1.102			
	42	3261	0.00	0.70	0.040	0.036	0.043	0.960			
J4	43	1611	0.00	0.91	0.053	0.039	0.056	1.054			
J4	44	289	0.00	0.51	0.072	0.052	0.065	0.904			
	45	171	0.00	0.37	0.098	0.088	0.059	0.608			
	46	140	0.00	0.64	0.098	0.049	0.119	1.213			
	47	93	0.00	0.07	0.020	0.018	0.015	0.726			
	50	423	0.00	0.27	0.055	0.047	0.042	0.758			
	51	313	0.00	0.64	0.055	0.040	0.060	1.087			
J5	52	79	0.01	0.50	0.139	0.122	0.094	0.676			
	54	1496	0.00	0.85	0.065	0.054	0.057	0.885			
	55	68	0.01	0.25	0.078	0.073	0.044	0.573			
	1001	3750	0.00	3.13	0.159	0.110	0.170	1.067			
	1002	283	0.00	1.18	0.207	0.146	0.185	0.896			
	1003	48	0.01	0.61	0.130	0.092	0.126	0.971			
	11	4069	0.00	1.23	0.063	0.040	0.072	1.145			
Z87	12	249	0.00	0.53	0.091	0.065	0.083	0.906			
	16	144	0.00	0.54	0.085	0.069	0.075	0.881			
	18	165	0.00	0.18	0.035	0.024	0.035	1.006			
	20	1054	0.00	0.56	0.037	0.024	0.045	1.229			
	21	174	0.00	0.18	0.023	0.015	0.026	1.091			
	13	2622	0.00	2.17	0.097	0.051	0.142	1.467			
	14	1792	0.00	0.55	0.049	0.033	0.056	1.131			
	15	26	0.01	0.14	0.045	0.033	0.035	0.766			
707/	17	1284	0.00	2.54	0.072	0.031	0.145	2.017			
Z87/ Z87S	19	131	0.00	0.33	0.035	0.023	0.045	1.273			
2010	22	60	0.01	0.36	0.083	0.065	0.069	0.822			
	23	22	0.01	0.16	0.046	0.042	0.036	0.792			
	24	34	0.00	0.14	0.030	0.020	0.027	0.883			
	25	282	0.00	0.60	0.031	0.020	0.046	1.466			

#### TABLE 14-10 COPPER COMPOSITES – DESCRIPTIVE STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project



## TABLE 14-11 SILVER COMPOSITES – DESCRIPTIVE STATISTICS Troilus Gold Corp. – Troilus Gold-Copper Project

7	Domain	Silver Resource Composites (g/t Ag)								
Zone	Domain	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Coefficient of Variation		
	40	217	0.00	2.80	0.674	0.500	0.543	0.806		
	41	2560	0.00	9.00	1.102	0.090	0.935	0.848		
	42	3261	0.00	8.05	0.943	0.750	0.796	0.844		
J4	43	1611	0.00	9.00	1.096	0.085	1.071	0.976		
54	44	289	0.00	6.00	1.321	1.100	1.086	0.822		
	45	171	0.25	2.50	0.761	0.600	0.552	0.725		
	46	140	0.15	6.00	1.483	0.884	1.583	1.067		
	47	93	0.10	1.00	0.352	0.300	0.206	0.585		
	50	423	0.00	5.20	0.881	0.620	0.838	0.951		
	51	313	0.00	3.55	0.584	0.364	0.574	0.983		
J5	52	79	0.06	2.40	0.641	0.600	0.418	0.652		
	54	1496	0.00	8.00	0.836	0.600	0.847	1.012		
	55	68	0.10	3.40	0.815	0.500	0.769	0.942		
	1001	3750	0.000	20.000	1.445	1.090	1.646	1.139		
	1002	283	0.000	20.000	2.789	1.670	3.315	1.189		
	1003	48	0.000	4.130	0.390	0.000	0.775	1.986		
	11	4069	0.000	15.000	0.909	0.600	1.174	1.292		
Z87	12	249	0.000	9.100	1.995	1.510	1.898	0.951		
	16	144	0.000	6.800	1.211	0.893	1.196	0.988		
	18	165	0.000	8.500	0.648	0.350	0.932	1.437		
	20	1054	0.000	10.000	0.634	0.350	1.015	1.599		
	21	174.00	0.000	12.200	0.596	0.350	1.126	1.888		
	13	2622	0.000	20.000	1.107	0.650	1.735	1.567		
	14	1792	0.000	15.000	1.371	0.900	1.786	1.303		
	15	26	0.250	7.200	1.275	0.950	1.469	1.152		
707/	17	1284	0.000	12.000	1.152	0.770	1.471	1.277		
Z87/ Z87S	19	131	0.000	5.170	1.076	0.850	0.919	0.854		
2010	22	60	0.250	5.200	1.383	1.105	1.076	0.778		
	23	22	0.250	1.700	0.772	0.650	0.516	0.669		
	24	34	0.250	5.700	1.796	1.450	1.527	0.851		
	25	282	0.000	9.700	0.633	0.410	0.814	1.287		

Denne 9

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707 (Damaina

#### VARIOGRAPHY

Variographic analysis was performed on resource composites from lenses 11 and 12 for Z87 and from lens 42 for J4. Experimental variograms were calculated for gold, copper, and silver and were oriented along the overall strike, dip, and across strike directions of the mineralized wireframes. For Z87 and J4, the down dip and along strike gold ranges of approximately 80 m to 90 m were similar, with no significant anisotropy. Unlike at Z87, the J4 along strike ranges for copper and silver were approximately twice the down dip ranges. Table 14-12 presents the variography parameters for Z87 and J4.

Z87 (Domains 10 & 11)	Azimuth	Dip	Orientation	Nugget	C1	Range 1 (m)	C2	Range 2 (m)
	0	0°	Strike			25		70
Au g/t	90°	60°	Dip	0.35	0.40	20	0.25	80
	90°	-30°	Width			4		10
	0	0°	Strike			28		90
Cu %	90°	60°	Dip	0.10	0.25	35	0.65	90
	90°	-30°	Width			4		18
	0	0°	Strike			28		90
Ag g/t	90°	60°	Dip	0.10	0.30	70	0.60	100
	90°	-30º	Width			2		16
J4 (Domain 42)	Azimuth	Dip	Orientation	Nugget	C1	Range 1	C2	Range 2 (m)
J4 (Domain 42)	Azimuth 0	<b>Dip</b> 0°	Orientation Strike	Nugget	C1	Range 1 35	C2	Range 2 (m) 85
<b>J4 (Domain 42)</b> Au g/t				Nugget	<b>C1</b> 0.40		<b>C2</b> 0.25	(m)
	0	0°	Strike			35		(m) 85
	0 90°	0° 60°	Strike Dip			35 55		(m) 85 85
	0 90° 90°	0° 60° -30°	Strike Dip Width			35 55 4		(m) 85 85
Au g/t	0 90° 90° 0	0° 60° -30° 0°	Strike Dip Width Strike	0.35	0.40	35 55 4 177		(m) 85 85
Au g/t	0 90° 90° 0 90°	0° 60° -30° 0° 60°	Strike Dip Width Strike Dip	0.35	0.40	35 55 4 177 100		(m) 85 85
Au g/t	0 90° 90° 0 90° 90°	0° 60° -30° 0° 60° -30°	Strike Dip Width Strike Dip Width	0.35	0.40	35 55 4 177 100 8		(m) 85 85 10

### TABLE 14-12 MODELLED VARIAGRAM PARAMETERS FOR J4 AND Z87 Troilus Gold Corp. – Troilus Gold-Copper Project



#### **BULK DENSITY**

The density values used in the block model supporting the Mineral Resource estimate are summarized in Table 14-13.

<b>TABLE 14-13</b>	SUMMARY OF BULK DENSITY VALUES
Troilus Go	old Corp. – Troilus Gold-Copper Project

Zone	Ore (t/m³)	Waste (t/m³)	Overburden (t/m³)		
J4-J5	2.80	2.77	2.2		
Z87	2.86	2.77	2.2		

In RPA's opinion, the ore and waste bulk densities are reasonable and acceptable.

#### Z87

Density test work was carried out on 2,721 core samples in the 30 deep drill holes (KN-648 to KN-677) by Inmet. The core samples tested were generally whole core pieces ranging in length from approximately 10 cm to 20 cm. Samples were weighed in air and in water by mine personnel, and the density results were adjusted to account for water temperature. Measurements on 496 resource related samples range from 2.57 g/cm<sup>3</sup> to 3.42 g/cm<sup>3</sup> and average 2.86 g/cm<sup>3</sup>. The same average is obtained when the lowest ten and highest ten density measurements are excluded.

#### J4 AND J5

The ore and waste tonnage factors are based on water immersion density test work results completed mostly by ALS in 2019. Density results for 13,409 core samples from J4 and J5 are available.

#### **BLOCK MODELS**

The resource estimate is supported by a block model setup in Geovia GEMS version 6.8.1. The extent of the block model covers both Z87 and J4-J5 areas. Table 14-14 presents the block model setup. The information carried in the block model includes:

- Material code for identification of mineralized and waste material,
- Interpolated gold, copper, silver, grades, and calculated gold-equivalent grades for mineralized blocks,



- The material densities,
- Classification,
- The distance to the closest composite used during interpolation,
- Number of composites and drill holes used for interpolation,
- Pass number, and
- Open pit or underground flagging.

Element	
Minimum East (Local)	9,000
Minimum North (Local)	12,200
Maximum Elevation (Local)	5455
Number of Row	730
Number of Column	380
Number of Level	191
Row size (m)	5
Column size (m)	5
Level size (m)	5
Rotation (deg. GEMS convention)	0

## TABLE 14-14BLOCK MODEL PROPERTIESTroilus Gold Corp. – Troilus Gold-Copper Project

Full blocks were flagged with the wireframe codes of the modelled solids. In order to reflect the volume of the mineralized wireframes, a threshold percent of block inside a wireframe was applied during the block selection process. The volume of flagged blocks was then compared to the mineralized wireframe analytical volume. The thresholds used for rock type block flagging was minimum 48% for Z87 Main and South. For J4, the minimum percent varied between 48% and 50%, while for J5, with narrower overall wireframes, threshold values were 45% to 48% depending on the wireframe.

# SEARCH STRATEGY AND GRADE INTERPOLATION PARAMETERS

RPA used ordinary kriging (OK) to estimate gold, copper, and silver grades using the two metre composites in two passes, with increasingly less restrictive sample search parameters. Search ellipse geometry and orientation were adjusted separately for the Z87 and J4-J5 areas.



Variogram parameters used are those presented earlier in Table 14-15. RPA also built inverse distance squared (ID<sup>2</sup>) and nearest neighbour (NN) models for comparison and validation purposes.

The first pass required a minimum of two holes for a block to be interpolated. The search ellipse ranges for the first pass resemble the variogram ranges, while the second pass has radii that are approximately twice of those used in the first pass. A hard boundary was imposed for each mineralized wireframe lens and only those capped composited samples contained within the target mineralized wireframe lens were used to estimate the grades.

# TABLE 14-15 SEARCH ELLIPSE AND SAMPLE SELECTION PARAMETERS Troilus Gold Corp. – Troilus Gold-Copper Project

			Compo	osites	Sea	rch Ellipse R (m)	adii	Rotation (GEMS ADA)			
Area	Pass	Min	Мах	Max/hole	Major	Semimajor	Minor	Azimuth	Dip	Intermediate Azimuth	
Z87	1	4	12	3	70	80	18	90	60	0	
	2	2	12	3	150	160	30	90	60	0	
J4-J5	1	4	12	3	85	85	10	90	70	0	
	2	2	12	3	150	160	30	90	70	0	

#### **BLOCK MODEL VALIDATION**

The RPA various methods to validate the block model included:

- Visual inspection and comparison of block grades with composite and assay grades,
- Statistical comparison of resource assay and block grade distributions, and
- Inspection of swath plots with composites and block grades elevations and northings.

RPA compared the block grades with the composite grades on sections and plans and found good overall visual correlation. Occasional minor grade smearing and banding occur locally when changes in wireframe dip or strike restrict the access to composites. As the Project advances and closer spaced definition drilling becomes available, additional refinements would be possible to the mineralized domains and interpolation procedure.

Figures 14-2 through 14-6 present typical vertical sections and plan views for Z87 (Section 13,700N and plan view elevations 5,005 and 4,845) and J4-J5 (Section 15,025N and plan view



elevation 5,205). A general 3D view of the AuEq interpolated block grade with the Z87 and J4-J5 resource pits is presented in Figure 14-7.



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Table 14-16 presents a comparison of the gold and copper averages by lens between capped assays, composites, and estimated average block grades. The comparison between composites and interpolated block values shows a slight, normal decrease of average grades for both gold and copper. For J4-J5, the differences in average grade of the different types of data are minimal, while for Z87 occasional larger differences are observed as is the case for the South extension mineralized lenses, where drill hole spacing is wider and the lenses are thinner, however, the comparison includes all the interpolated blocks, prior to classification.

## TABLE 14-16COMPARISON BETWEEN ASSAYS, COMPOSITES, AND<br/>BLOCKS

Zone	Domain	Assay Au (g/t) Mean	Comp Au (g/t) Mean	Block Au (g/t) Mean	Assay Cu (%) Mean	Comp Cu (%) Mean	Block Cu (%) Mean	Assay Ag (g/t) Mean	Comp Ag (g/t) Mean	Block Ag (g/t) Mean
	40	0.329	0.330	0.350	0.063	0.064	0.065	0.616	0.674	0.688
	41	0.551	0.543	0.500	0.065	0.063	0.069	1.078	1.102	1.053
	42	0.811	0.792	0.741	0.046	0.040	0.048	0.861	0.943	0.894
J4	43	0.669	0.648	0.579	0.054	0.053	0.056	1.027	1.096	1.100
54	44	0.504	0.520	0.552	0.072	0.072	0.084	1.333	1.321	1.382
	45	0.313	0.314	0.329	0.092	0.098	0.090	0.742	0.761	0.790
	46	0.520	0.531	0.577	0.093	0.098	0.101	1.412	1.483	1.483
	47	0.472	0.482	0.478	0.021	0.020	0.018	0.352	0.352	0.335
	50	0.418	0.411	0.423	0.055	0.055	0.058	0.861	0.881	0.855
	51	0.564	0.547	0.506	0.053	0.055	0.055	0.526	0.584	0.490
J5	52	0.177	0.182	0.165	0.135	0.139	0.129	0.617	0.641	0.651
	54	0.407	0.403	0.426	0.066	0.065	0.072	0.815	0.836	0.876
	55	0.421	0.374	0.352	0.078	0.078	0.076	0.755	0.815	0.802
	1001	1.596	1.560	1.627	0.161	0.159	0.147	1.409	1.445	1.176
	1002	1.630	1.538	1.434	0.214	0.207	0.170	2.868	2.789	2.298
	1003	2.114	1.974	2.078	0.138	0.130	0.153	0.240	0.390	0.420
	11	0.545	0.531	0.464	0.064	0.063	0.061	0.850	0.909	0.908
Z87	12	0.412	0.420	0.456	0.095	0.091	0.097	2.099	1.995	2.130
	16	0.292	0.315	0.394	0.090	0.085	0.091	1.326	1.211	1.512
	18	0.719	0.745	0.620	0.034	0.035	0.028	0.608	0.648	0.604
	20	0.612	0.619	0.604	0.037	0.037	0.035	0.525	0.634	0.748
	21	0.531	0.524	0.429	0.024	0.023	0.023	0.531	0.596	0.993
	13	0.714	0.702	0.616	0.103	0.097	0.083	1.068	1.107	0.873
	14	0.740	0.695	0.550	0.050	0.049	0.056	1.248	1.371	1.138
	15	0.551	0.551	0.506	0.045	0.045	0.048	1.275	1.275	1.917
Z87/	17	0.583	0.587	0.603	0.077	0.072	0.071	1.047	1.152	1.094
Z87S	19	0.615	0.614	0.684	0.044	0.035	0.037	0.977	1.076	1.093
2010	22	0.356	0.367	0.369	0.086	0.083	0.086	1.389	1.383	1.282
	23	0.472	0.451	0.510	0.049	0.046	0.045	0.779	0.772	0.783
	24	0.403	0.403	0.429	0.030	0.030	0.026	1.796	1.796	1.576
	25	0.523	0.532	0.580	0.033	0.031	0.031	0.638	0.633	0.636

Troilus Gold Corp. – Troilus Gold-Copper Project



RPA examined, by means of swath plots by northing and by elevation, the distribution of gold and copper composite, and block grades interpolated using OK and ID<sup>2</sup>. No issues were found with the distribution of interpolated grades. Figures 14-8and 14-9 present the swath plots by northing for Au and Cu for all the classified blocks.



FIGURE 14-8 GOLD SWATH PLOT BY NORTHING





FIGURE 14-9 COPPER SWATH PLOT BY NORTHING

RPA considers that the Troilus Z87 and J4-J5 block model is valid, reasonable, and appropriate for supporting the Mineral Resource estimate.

#### CLASSIFICATION

Definitions for Mineral Resource categories used in this report are consistent with those defined by CIM (2014) and referenced by NI 43-101. In the CIM classification, a Mineral Resource is defined as "a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction". Mineral Resources are classified into Measured, Indicated, and Inferred categories. A Mineral Reserve is defined as the "economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a



Preliminary Feasibility Study". Mineral Reserves are classified into Proven and Probable categories. No Mineral Reserves have been estimated for Project.

Blocks interpolated in the first pass, requiring at least two holes, and within 60 m from a drill hole were initially considered for classification into the Indicated Mineral Resource category. A manual contour was then digitized, on a lens by lens basis, consolidating the areas with contiguous candidate blocks and discarding isolated blocks or patches of blocks retained with the numerical approach. The manual contours were used to classify the blocks retained inside the contours into the Indicated Mineral Resource category. Out of the remaining interpolated blocks, those within 120 m from a drill hole were classified into the Inferred Mineral Resource category.

The open pit and underground resource classified blocks are shown in Figures 14-10 and 14-11, respectively.







#### **CUT-OFF GRADE AND WHITTLE PARAMETERS**

For the Mineral Resource estimate, RPA used an open pit discard cut-off grade of 0.3 g/t AuEq for mineralization situated within the Whittle pit shell for both Z87 and J4-J5, and an underground bulk mining cut-off grade of 0.9 g/t AuEq for Z87 mineralization lying below the pit shell.

Metal prices used are based on consensus, long term forecasts from banks, financial institutions, and other sources. RPA's metal price, operating cost, and recovery assumptions are summarized in Table 14-17.

RPA used the Indicated and Inferred Mineral Resource block AuEq grades and the input assumptions in Table 14-17 to generate an open pit shell in Whittle to provide a constraint for the open pit resource that complies with the CIM (2014) resource definition requirement for "reasonable prospects for eventual economic extraction". RPA converted the gold, copper, and silver grade models into AuEq block grades using the following equations:

Z87 AuEq (g/t) = Au grade + 1.546 x Cu grade + 0.010 \* Ag grade J4-J5 AuEq (g/t) = Au grade + 1.47 x Cu grade + 0.013 \* Ag grade

The slight differences in the AuEq equations are due to different metal recovery estimates for Z87 versus J4-J5. The gold, copper, and silver revenue contributions for Z87 are approximately 83%, 16%, and 1%, respectively, compared to 87%, 10%, and 3%, respectively, for J4-J5.

RPA notes that the discard cut-off grade is only applicable to the resource blocks situated inside the Whittle open pit shell constraint. Mining costs for reporting the open pit Mineral Resources are incorporated in the Whittle process and are not included in the discard cut-off grade calculation.



<b>TABLE 14-17</b>	<b>CUT-OFF GRADE INPUTS AND WHITTLE ASSUMPTIONS</b>
٦	Froilus Gold Corp. – Troilus Gold-Copper Project

Input Parameter	Units	Value
Gold Price	US\$/oz	1,400
Copper price	US\$/lb	3.25
Silver Price	US\$/oz	20
Exchange rate	C\$/US\$	0.80
Z87 Recovery - Gold	%	83
Z87 Recovery - Copper	%	92
Z87 Recovery - Silver	%	76
J4-J5 Recovery - Gold	%	82
J4-J5 Recovery - Copper	%	88
J4-J5 Recovery - Silver	%	76
Open pit mining Cost	US\$/t	3.00
Underground mining Cost	US\$/t	28.00
Processing and G&A Cost	US\$/t	12.00
Pit Slopes – Z87 north & south walls	Degrees	56
Pit Slopes – Z87 east wall	Degrees	49.5
Pit Slopes – Z87 west wall	Degrees	53
Pit Slopes – J4 and J5 E walls	Degrees	50
Pit Slopes – J4 and J5 N, S, & W walls	Degrees	60

All classified resource blocks located between the current topography surface and the Whittle open pit shell constraint with grades greater than 0.3 g/t AuEq are included in the resource estimate.

The Z87 underground resource consists of blocks situated below the Whittle shell, in areas with contiguous blocks of grade 0.9 g/t AuEq or higher. A manual override was applied to discard scattered blocks or patches of isolated higher grade blocks.

#### MINERAL RESOURCE REPORTING SENSITIVITY

RPA estimated Mineral Resources for the Project and reported open pit resources at a pit discard cut-off grade of 0.3 g/t AuEq and underground resources at a cut-off grade of 0.9 g/t AuEq. The resources for underground Z87, open pit Z87, and J4-J5, are reported below at various cut-off values, grouped by class (Tables 14-18 to 14-20).



### TABLE 14-18Z87 UNDERGROUND RESOURCES AT VARIOUS CUT-OFFVALUES

Classification	Cut-off AuEq (g/t)	Tonnes (000 t)	Au (g/t)	Cu (%)	Ag (g/t)	AuEq (g/t)	Contained Gold (oz)	Contained Copper (Ib)	Contained Silver (oz)	Contained AuEq (oz)
Indicated	2.0	5,439	2.58	0.21	1.56	2.91	450,795	24,660,533	272,986	509,125
	1.5	10,246	2.06	0.18	1.46	2.35	679,879	40,274,125	480,931	775,491
	1.0	17,361	1.66	0.15	1.20	1.90	927,354	56,845,972	667,248	1,062,193
	0.9	18,280	1.62	0.15	1.16	1.86	951,784	58,451,029	684,115	1,090,410
	0.8	18,826	1.59	0.14	1.15	1.83	964,738	59,289,455	694,374	1,105,356
	0.7	19,178	1.58	0.14	1.14	1.81	972,088	59,782,333	701,390	1,113,888
Inferred	2.0	4,755	2.99	0.15	0.64	3.22	457,413	15,355,805	97,930	493,013
	1.5	7,420	2.46	0.14	0.82	2.68	586,765	22,619,395	196,672	639,730
	1.0	13,694	1.81	0.12	0.75	2.01	795,235	37,400,908	330,461	882,864
	0.9	16,570	1.63	0.12	0.67	1.82	869,921	43,596,562	356,444	971,779
	0.8	16,875	1.62	0.12	0.66	1.81	876,871	44,195,601	358,842	980,103
	0.7	16,993	1.61	0.12	0.66	1.80	879,280	44,412,370	359,061	983,004

Troilus Gold Corp. – Troilus Gold-Copper Project



## TABLE 14-19 Z87 OPEN PIT RESOURCES AT VARIOUS CUT-OFF VALUES Troilus Gold Corp. – Troilus Gold-Copper Project

Classification	Cut-off AuEq	Tonnes	Au	Cu	Ag	AuEq	Contained Gold	Contained Copper	Contained Silver	Contained AuEq
<u> </u>	(g/t)	(000 t)	(g/t)	(%)	(g/t)	(g/t)	(oz)	(lb)	(oz)	(oz)
Indicated	2.0	5,470	2.25	0.24	2.59	2.64	395,024	29,044,040	455,145	465,059
	1.5	10,091	1.88	0.21	2.33	2.22	609,674	46,426,530	754,493	721,893
	1.0	18,842	1.49	0.16	1.98	1.76	900,871	67,433,003	1,198,134	1,064,888
	0.9	21,921	1.39	0.15	1.90	1.64	980,261	73,231,135	1,335,624	1,158,726
	0.8	26,005	1.28	0.14	1.80	1.52	1,073,903	80,324,288	1,507,851	1,270,082
	0.7	31,209	1.17	0.13	1.71	1.39	1,177,736	88,817,624	1,714,778	1,395,134
	0.6	38,359	1.05	0.12	1.62	1.25	1,299,270	99,681,479	1,993,647	1,543,950
	0.5	47,521	0.93	0.11	1.53	1.12	1,428,304	112,620,125	2,344,956	1,705,669
	0.4	56,971	0.84	0.10	1.46	1.01	1,536,065	124,028,831	2,678,728	1,842,490
	0.3	63,830	0.78	0.09	1.41	0.94	1,597,627	130,579,022	2,890,372	1,920,936
	0.2	66,025	0.76	0.09	1.39	0.91	1,612,198	132,138,076	2,950,151	1,939,620
	0.1	66,294	0.76	0.09	1.39	0.91	1,613,297	132,279,933	2,957,178	1,941,110
Inferred	2.0	197	2.81	0.18	3.73	3.13	17,805	802,222	23,649	19,851
	1.5	401	2.12	0.17	2.98	2.41	27,286	1,537,247	38,397	31,136
	1.0	1,345	1.36	0.11	2.12	1.54	58,817	3,120,771	91,691	66,770
	0.9	2,081	1.18	0.09	1.82	1.33	78,901	3,919,591	122,007	88,958
	0.8	3,239	1.03	0.07	1.72	1.16	106,899	5,223,557	179,159	120,468
	0.7	4,788	0.90	0.07	1.60	1.02	138,934	7,179,860	246,487	157,586
	0.6	6,795	0.80	0.07	1.54	0.91	173,934	9,819,156	336,701	199,439
	0.5	8,906	0.71	0.07	1.54	0.83	203,458	12,811,110	440,354	236,746
	0.4	11,019	0.64	0.06	1.49	0.75	227,391	15,380,285	529,377	267,361
	0.3	12,616	0.59	0.06	1.48	0.70	241,089	17,105,241	600,877	285,664
	0.2	12,997	0.58	0.06	1.46	0.69	243,610	17,378,686	610,070	288,893
	0.1	13,060	0.58	0.06	1.45	0.69	243,884	17,396,521	610,666	289,213
		-							-	



## TABLE 14-20 J4-J5 OPEN PIT RESOURCES AT VARIOUS CUT-OFF VALUES Troilus Gold Corp. – Troilus Gold-Copper Project

Classification	Cut-off AuEq	Tonnes (000 t)	Au (a/b)	Cu (%)	Ag	AuEq	Contained Gold	Contained Copper (Ib)	Contained Silver (oz)	Contained AuEq
Indicated	(g/t)	· ·	(g/t)		(g/t)	(g/t)	(oz)		. /	(oz)
Indicated	2.0	1,437	2.46	0.12	1.29	2.65	113,669	3,786,930	59,615	122,563
	1.5	3,168	1.98	0.10	1.24	2.14	201,610	6,664,683	125,996	217,536
	1.0	9,910	1.35	0.08	1.24	1.49	431,380	17,866,189	394,669	474,812
	0.9	13,208	1.22	0.08	1.23	1.35	518,888	23,123,290	522,786	575,255
	0.8	17,932	1.09	0.08	1.22	1.22	629,052	30,617,123	703,994	703,840
	0.7	24,967	0.96	0.08	1.20	1.09	771,628	41,356,513	963,334	872,810
	0.6	35,376	0.84	0.07	1.16	0.96	951,435	56,389,546	1,321,898	1,089,507
	0.5	48,550	0.73	0.07	1.12	0.85	1,138,406	74,938,946	1,744,169	1,321,734
	0.4	64,342	0.64	0.07	1.06	0.75	1,314,545	96,475,982	2,194,092	1,549,892
	0.3	76,950	0.57	0.07	1.01	0.68	1,421,031	112,120,476	2,496,200	1,693,844
	0.2	80,980	0.56	0.07	0.99	0.66	1,445,656	116,201,392	2,571,012	1,728,190
	0.1	81,552	0.55	0.06	0.98	0.66	1,447,872	116,555,653	2,578,354	1,731,261
Inferred	2.0	238	2.36	0.05	1.39	2.45	18,050	268,560	10,664	18,765
	1.5	641	1.87	0.06	1.34	1.99	38,638	891,555	27,641	40,908
	1.0	2,754	1.24	0.07	1.36	1.36	109,598	4,421,541	120,446	120,642
	0.9	3,789	1.12	0.07	1.32	1.25	136,778	6,169,761	161,154	152,099
	0.8	5,407	1.00	0.08	1.29	1.13	174,105	8,954,449	224,225	196,217
	0.7	7,590	0.90	0.07	1.23	1.02	218,861	12,127,704	300,141	248,762
	0.6	10,489	0.80	0.07	1.17	0.92	268,903	16,364,549	393,459	309,100
	0.5	14,406	0.70	0.07	1.11	0.82	323,878	22,121,641	515,405	378,002
	0.4	19,484	0.61	0.07	1.04	0.72	380,491	29,037,803	654,311	451,248
	0.3	23,549	0.55	0.07	1.00	0.66	414,461	34,192,710	754,347	497,569
	0.2	24,881	0.53	0.06	0.97	0.64	422,677	35,524,451	779,455	508,967
	0.1	25,058	0.53	0.06	0.97	0.63	423,426	35,612,683	781,980	509,938
		-							-	-



### **15 MINERAL RESERVE ESTIMATE**



#### **16 MINING METHODS**



### **17 RECOVERY METHODS**



### **18 PROJECT INFRASTRUCTURE**



### **19 MARKET STUDIES AND CONTRACTS**


### 20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

### **BASELINE STUDIES**

Baseline studies were conducted prior to the exploitation of the mine in 1997, however, due to the elapsed time, new baseline studies are to be undertaken by expert consultants who will consider the following environmental and social aspects:

- Site hydrology;
- Surface and groundwater quality;
- Climate and air quality;
- Vegetation and wetlands;
- Fish and associated habitat;
- Terrestrial and avian wildlife;
- Archeological values;
- Land use and resources; and
- Socio-economics.

The baseline studies will focus on a description of existing conditions, considering that the site has already been impacted by the operation of a mine for more than 12 years. The impact of infrastructure building, mining, and processing operations and the residual impact upon closure and site reclamation will be assessed in the environment assessment process.

### SOCIAL AND COMMUNITY CONSIDERATIONS AND ASPECTS

Of significant importance will be social acceptability and consultations with local Cree communities and representatives, as well as the Jamesians neighbors. The neighboring communities, both Native and Jamesian already have experience and expertise with the mining sector.

The Project is subject to the 1975 James Bay and Northern Quebec Agreement (JBNQA), and the 2002 Paix des Braves Agreement. The Project is within the Grand Council of the Crees (Eeyou Istchee) Territory of the Mistissini Cree First Nation, and on the traditional trapping



territories held by the tallyman for hunting and fishing activity on the lands on which the Project is located.

The JBNQA includes the following two important principles:

- Quebec will be able to access territorial resources for the benefit of all; and
- The Government of Quebec recognize the needs of the Cree people.

The Paix des Braves Agreement includes these considerations:

- Establishment of a partnership to ensure full territorial development;
- Autonomy and augmented management by the Cree of their own economic and community development; and
- A respect for sustainable development and Cree traditions.

In June 2018, Troilus adopted the Pre-Development Agreement (the PDA) with the Mistissini Cree, Eeyou Istche, and the Cree Nation Government previously negotiated with Sulliden Mining Capital Inc.

### ENVIRONMENTAL ASSESSMENT AND PERMITTING PROCESS

Under the JBNQA, an advisory committee was established for projects in the Eeyou Istchee region south of 55°, the James Bay Advisory Committee on the Environment (JBACE). There are four members each from Quebec, Canada, and the Cree Regional Authority plus one person representing hunting, fishing, and trapping. JBACE created two addition committees – the first is COMEV, a Quebec/Cree/Canada bureau/agency for assessing project descriptions and preparing guidelines for an Environmental and Social Impact Assessment (ESIA); the second is COMEX which is a Quebec/Cree bureau for reviewing regional projects.

The Project review process will be composed of five steps:

- The Proponent prepares and submits a detailed Project Description to COMEV.
- COMEV assesses the Project, its potential impact and prepares guidelines for the Project ESIA.
- The Proponent prepares an ESIA and submits it to COMEX.
- COMEX, with input from the Cree people and Quebec public, reviews the ESIA.
- The COMEX administrator renders a decision.



Following a successful review process, and assurance of compliance with Quebec Law (including Directive 019), submissions will be made to the Cree Authority and to the Government of Quebec for certificates of approval and permits.

On August 28, 2019, the Impact Assessment Act, the Canadian Energy Regulator Act, and the Canadian Navigable Waters Act came into effect. The Impact Assessment Act created the new Impact Assessment Agency of Canada and repealed the Canadian Environmental Assessment Act, 2012. The Physical Activities Regulations gives the new threshold of 5,000 tpd of extraction as the trigger to have a federal environmental impact assessment. The Project will most likely exceed this production rate threshold and a federal environmental assessment (EA) will be required.

The assessment and approval processes for the Project is not expected to be onerous but can take some time to complete, approximately two or more years.

No known environmental issues have been identified at the site that would materially affect the current mine, design, or scope of the needed environmental permits. The most substantive potential impacts of projects are generally associated with the long-term management of waste rock, tailings, mine water and process water and their downstream effects on water and fish habitat. With the application of appropriate engineering design, project planning, and implementation of mine and environmental management plans, projects can avoid any significant environmental effects.

Since there is presence of a tailings area and waste piles since 1997 from the former mine with no significant environmental effects, the risk of having issues with the same orebody is very low.



## **21 CAPITAL AND OPERATING COSTS**

This section is not applicable.



## **22 ECONOMIC ANALYSIS**

This section is not applicable.



## **23 ADJACENT PROPERTIES**

There are no significant properties to report in this section.



# 24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.



## **25 INTERPRETATION AND CONCLUSIONS**

There are significant underground and open pit resources remaining at Troilus. The mineralization gold grade and thicknesses are very continuous, and the mineralization is still open at depth.

Several advanced engineering studies were completed in 2005 and 2006 that investigated a number of underground development scenarios based on metal prices that were approximately one third of those used for this resource estimate. The various scenarios generated positive cash flows but required significant up-front capital expenditures, mostly for the extensive underground development that needed to be in place before stoping could begin.

All the underground studies in 2005 and 2006 were tailored to feeding the existing 20,000 tpd mill. Now that the mill has been removed, there is an opportunity to examine scenarios based on a smaller mill.

RPA is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

RPA concludes that a significant amount of technical work has been carried out by earlier operators and that more exploration and engineering work is warranted.



## **26 RECOMMENDATIONS**

RPA recommends that Troilus continue to evaluate the technical and economic viability of the Project. RPA recommends that a Preliminary Economic Assessment (PEA), additional in-fill and step out drilling, and engineering studies be completed in 2020. RPA recommends a two phase program and budget approach for the above work, with Phase 2 contingent on positive results from Phase 1 (Tables 26-1 and 26-2).

## TABLE 26-1 RECOMMENDED PROGRAM AND BUDGET - PHASE 1 Troilus Gold Corp. – Troilus Gold-Copper Project

Item	Total (C\$ 000)
Phase 1	
Exploration Drilling (20,000 m at \$200/m)	4,000
Environmental Work	100
PEA	300
Claims and Mining Lease Renewal Fees	100
Contingency	200
Total Phase 1	4,700

## TABLE 26-2 RECOMMENDED PROGRAM AND BUDGET – PHASE 2 Troilus Gold Corp. – Troilus Gold-Copper Project

Item	Total (C\$ 000)
Phase 2	
Exploration Drilling (10,000 m at \$200/m)	2,000
Geotechnical data and study	500
Metallurgical Study	300
Environmental Work	200
Prefeasibility Study	1,000
Contingency	500
Total Phase 2	4,500

RPA recommends the following work:

- Complete a PEA.
- Continue diamond drilling to potentially upgrade and expand the current resources.
- Carry out geotechnical studies.
- Carry out metallurgical studies.
- Carry out environmental studies.



- Assess the potential for new mineralized zones on the Troilus property that are outside the current areas with resources.
- Review the site monitoring results and re-assess the site restoration plan schedule and cost.



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### **RELATED TO PIT SLOPE DESIGNS**

- Bélanger, 2002, Étude de Faisabilité des Pentes de la Fosse J4. Internal Report Prepared for Les Mines Inmet Division Troilus, 18 p.
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- Piteau, 2001, Slope Stability Analysis and Design Update for the West Wall of Fosse 87. 24p.
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- Roche Ltée., 1991, Analyse de stabilité: Projet Troilus- Frotet. Prefeasibility Study Report Troilus. Report Prepared for Minnova, November, 130 p.
- Supportek, 1993, Stabilité des Pentes et Aspects Connexes Fosse 87 et J-4 du Projet Troilus. Report Prepared for Corporation Minière Metall, August, 61p.

### **RELATED TO SITE RESTORATION**

Genivar, 2009, Plan de Fermeture et de Restauration du Site Troilus, November 2009, 482 p.

- Quebec Ministry of Sustainable Development, Environment and Parks, 2012, Modification Letter Dated May 23, 2012 Regarding Certificate of Authorization No. 3214-14-025 Site Restoration, 2 p.
- Quebec Ministry of Sustainable Development, Environment and Parks, 2010, Modification Letter Dated November 3, 2010 Regarding Certificate of Authorization No. 3214-14-025 Site Restoration, 8 p.



## **28 DATE AND SIGNATURE PAGE**

This report titled "Technical Report on the Troilus Gold-Copper Project Mineral Resource Estimate, Quebec, Canada" and dated December 20, 2019, was prepared and signed by the following author:

#### (Signed and Sealed) "Luke Evans"

Dated at Toronto, Ontario December 20, 2019 Luke Evans, M.Sc., P.Eng. Executive Vice President, Geology and Mineral Resources



## 29 CERTIFICATE OF QUALIFIED PERSON

### LUKE EVANS

I, Luke Evans, M.Sc., P.Eng., as an author of this report titled "Technical Report on the Troilus Gold-Copper Project Mineral Resource Estimate, Quebec, Canada", prepared for Troilus Gold Corp., and dated December 20, 2019 do hereby certify that:

- 1. I am a Principal Geological Engineer and Executive Vice President, Geology and Mineral Resources, with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
- 2. I am a graduate of University of Toronto, Ontario, Canada, in 1983 with a Bachelor of Science (Applied) degree in Geological Engineering and Queen's University, Kingston, Ontario, Canada, in 1986 with a Master of Science degree in Mineral Exploration.
- 3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #90345885) and the Province of Quebec (Reg.# 105567). I have worked as a professional geological engineer for over 30 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Consulting Geological Engineer specializing in resource and reserve estimates, audits, technical assistance, and training since 1995.
  - Review and report as a consultant on numerous exploration and mining projects around the world for due diligence and regulatory requirements.
  - Senior Project Geologist in charge of exploration programs at several gold and base metal mines in Quebec.
  - Project Geologist at a gold mine in Quebec in charge of exploration and definition drilling.
  - Project Geologist in charge of sampling and mapping programs at gold and base metal properties in Ontario, Canada.
- 4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- 5. I visited the Troilus Gold-Copper Project on August 19, 2019 and July 19, 2018. I also visited the Troilus Gold-Copper Project on June 17, 2014, from March 18 to 27, 2003, from February 10 to 20, 2003, January 20 to 30, 2003, from September 25 to October 1, 2002, and from August 13 to 15, 2002.
- 6. I am responsible for all sections of the Technical Report.
- 7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
- 8. I have had prior involvement with the property that is the subject of the Technical Report including preparing Technical Reports on the open pit resources in 2003 and the underground resources in 2006. I have also prepared Technical Reports on an



updated Troilus Gold-Copper Project open pit and underground resources dated July 25, 2014 and June 30, 2016.

- 9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
- 10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 20<sup>th</sup> day of December, 2019

#### (Signed and Sealed) "Luke Evans"

Luke Evans, M.Sc., P.Eng.



### **30 APPENDIX 1**

**CLAIM LISTS** 



### TABLE 30-1 LIST OF TROILUS PROPERTY CLAIMS Troilus Gold Corp. - Troilus Gold-Copper Project

Count	FID	SNRC	Range	Lot	Title	Claim	Expiry Date	Area (ha)	Fees (\$)
1		32J16	0001	0001	BM	829	11-03-26	840	\$53,964.80
2	24	32J15	0027	0056	CDC	1133905	27-04-21	54.22	65.25
3	53	32J15	0027	0057	CDC	1133906	27-04-21	54.22	65.25
4	15	32J15	0027	0058	CDC	1133907	27-04-21	54.22	65.25
5	41	32J15	0027	0059	CDC	1133908	27-04-21	54.22	65.25
6	17	32J15	0027	0060	CDC	1133909	27-04-21	54.22	65.25
7	31	32J15	0028	0056	CDC	1133913	27-04-21	54.21	65.25
8	16	32J15	0028	0057	CDC	1133914	27-04-21	54.21	65.25
9	79	32J15	0028	0058	CDC	1133915	27-04-21	54.21	65.25
10	20	32J15	0028	0059	CDC	1133916	27-04-21	54.21	65.25
11	73	32J15	0028	0060	CDC	1133917	27-04-21	54.21	65.25
12	48	32J15	0029	0056	CDC	1133918	27-04-21	54.2	65.25
13	43	32J15	0029	0057	CDC	1133919	27-04-21	54.2	65.25
14	18	32J15	0029	0058	CDC	1133920	27-04-21	54.2	65.25
15	19	32J15	0029	0059	CDC	1133921	27-04-21	54.2	65.25
16	70	32J15	0029	0060	CDC	1133922	27-04-21	54.2	65.25
17	38	32J15	0030	0057	CDC	1133923	27-04-21	54.19	65.25
18	8	32J15	0030	0058	CDC	1133924	27-04-21	54.19	65.25
19	47	32J15	0030	0059	CDC	1133925	27-04-21	54.19	65.25
20	32	32J15	0030	0060	CDC	1133926	27-04-21	54.19	65.25
21	7	32J16	0028	0001	CDC	1133929	27-04-21	54.21	65.25
22	34	32J16	0028	0002	CDC	1133930	27-04-21	54.21	65.25
23	59	32J16	0029	0001	CDC	1133936	27-04-21	54.2	65.25
24	61	32J16	0029	0002	CDC	1133937	27-04-21	54.2	65.25
25	5	32J16	0029	0003	CDC	1133938	27-04-21	54.2	65.25
26	76	32J16	0029	0004	CDC	1133939	27-04-21	54.2	65.25
27	33	32J16	0029	0005	CDC	1133940	27-04-21	54.2	65.25
28	2	32J16	0029	0006	CDC	1133941	27-04-21	54.2	65.25
29	63	32J16	0029	0007	CDC	1133942	27-04-21	54.2	65.25
30	30	32J16	0030	0001	CDC	1133943	27-04-21	54.19	65.25
31	51	32J16	0030	0002	CDC	1133944	27-04-21	54.19	65.25
32	65	32J16	0030	0003	CDC	1133945	27-04-21	54.19	65.25
33	36	32J16	0030	0004	CDC	1133946	27-04-21	54.2	65.25
34	80	32J16	0030	0005	CDC	1133947	27-04-21	51.28	65.25
35	26	32J16	0030	0006	CDC	1133948	27-04-21	54.15	65.25
36	55	32J16	0030	0007	CDC	1133949	27-04-21	54.2	65.25
37	21	32J16	0030	0008	CDC	1133950	27-04-21	54.2	65.25
38	49	32001	0001	0001	CDC	1133951	27-04-21	54.19	65.25
39	78	32001	0001	0002	CDC	1133952	27-04-21	54.13	65.25
40	67	32001	0001	0003	CDC	1133953	27-04-21	41.82	65.25
41	75	32001	0001	0004	CDC	1133954	27-04-21	20.08	65.25
42	25	32001	0001	0005	CDC	1133955	27-04-21	1.95	65.25



Count	FID	SNRC	Range	Lot	Title	Claim	Expiry Date	Area (ha)	Fees (\$)
43	68	32001	0001	0006	CDC	1133956	27-04-21	25.1	65.25
44	1	32001	0001	0007	CDC	1133957	27-04-21	54.15	65.25
45	56	32001	0001	8000	CDC	1133958	27-04-21	54.19	65.25
46	45	32001	0001	0009	CDC	1133959	27-04-21	54.19	65.25
47	46	32001	0002	0001	CDC	1133960	27-04-21	46.18	65.25
48	9	32001	0002	0002	CDC	1133961	27-04-21	9.42	65.25
49	42	32001	0002	0007	CDC	1133962	27-04-21	25.33	65.25
50	71	32001	0002	8000	CDC	1133963	27-04-21	54.15	65.25
51	54	32001	0002	0009	CDC	1133964	27-04-21	54.18	65.25
52	23	32001	0003	0001	CDC	1133965	27-04-21	54.16	65.25
53	10	32001	0003	0002	CDC	1133966	27-04-21	26.66	65.25
54	72	32001	0003	0006	CDC	1133967	27-04-21	0.2	65.25
55	57	32001	0003	0007	CDC	1133968	27-04-21	13.83	65.25
56	12	32001	0003	8000	CDC	1133969	27-04-21	47.87	65.25
57	14	32001	0004	0001	CDC	1133970	27-04-21	54.16	65.25
58	0	32001	0004	0002	CDC	1133971	27-04-21	54.16	65.25
59	35	32001	0004	0003	CDC	1133972	27-04-21	27.32	65.25
60	4	32001	0004	0004	CDC	1133973	27-04-21	0.01	65.25
61	44	32001	0004	0004	CDC	1133974	27-04-21	4.23	65.25
62	40	32001	0004	0005	CDC	1133975	27-04-21	24.44	65.25
63	3	32001	0004	0006	CDC	1133976	27-04-21	46.01	65.25
64	13	32001	0004	0007	CDC	1133977	27-04-21	54.16	65.25
65	52	32001	0004	0008	CDC	1133978	27-04-21	54.16	65.25
66	39	32001	0005	0003	CDC	1133979	27-04-21	54.15	65.25
67	28	32001	0005	0004	CDC	1133980	27-04-21	53.11	65.25
68	22	32001	0005	0005	CDC	1133982	27-04-21	54.15	65.25
69	58	32001	0005	0006	CDC	1133983	27-04-21	54.15	65.25
70	77	32001	0005	0007	CDC	1133984	27-04-21	54.15	65.25
71	50	32001	0005	8000	CDC	1133985	27-04-21	54.15	65.25
72	11	32002	0001	0057	CDC	1133998	27-04-21	54.18	65.25
73	64	32002	0001	0058	CDC	1133999	27-04-21	54.19	65.25
74	37	32002	0001	0059	CDC	1134000	27-04-21	54.19	65.25
75	27	32002	0001	0060	CDC	1134001	27-04-21	54.19	65.25
76	62	32002	0002	0057	CDC	1134002	27-04-21	54.18	65.25
77	6	32002	0002	0058	CDC	1134003	27-04-21	54.18	65.25
78	69	32002	0002	0059	CDC	1134004	27-04-21	54.18	65.25
79	60	32002	0002	0060	CDC	1134005	27-04-21	54.18	65.25
80	29	32002	0003	0058	CDC	1134006	27-04-21	54.17	65.25
81	74	32002	0003	0059	CDC	1134007	27-04-21	54.17	65.25
82	66	32002	0003	0060	CDC	1134008	27-04-21	54.17	65.25
Totals						82		4,718.60	\$58,994.05



## TABLE 30-2 LIST OF TROILUS NORTH PROPERTY CLAIMS Troilus Gold Corp. - Troilus Gold-Copper Project

Property	Claim	Expiry Date	Area (ha)	Fees
TROILUS NORTH EMGOLD	2424713	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424714	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424715	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424716	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424717	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424718	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424719	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424720	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424721	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424722	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424723	16-Mar-21	54.11	\$ 65.25
TROILUS NORTH EMGOLD	2424724	16-Mar-21	54.11	\$ 65.25
TROILUS NORTH EMGOLD	2424725	16-Mar-21	54.11	\$ 65.25
TROILUS NORTH EMGOLD	2424726	16-Mar-21	54.11	\$ 65.25
TROILUS NORTH EMGOLD	2424727	16-Mar-21	54.10	\$ 65.25
TROILUS NORTH EMGOLD	2424728	16-Mar-21	54.10	\$ 65.25
TROILUS NORTH EMGOLD	2424729	16-Mar-21	54.10	\$ 65.25
TROILUS NORTH EMGOLD	2424730	16-Mar-21	54.09	\$ 65.25
TROILUS NORTH EMGOLD	2424731	16-Mar-21	54.09	\$ 65.25
TROILUS NORTH EMGOLD	2424732	16-Mar-21	54.09	\$ 65.25
TROILUS NORTH EMGOLD	2424748	16-Mar-21	54.16	\$ 65.25
TROILUS NORTH EMGOLD	2424749	16-Mar-21	54.16	\$ 65.25
TROILUS NORTH EMGOLD	2424750	16-Mar-21	54.15	\$ 65.25
TROILUS NORTH EMGOLD	2424751	16-Mar-21	54.15	\$ 65.25
TROILUS NORTH EMGOLD	2424752	16-Mar-21	54.15	\$ 65.25
TROILUS NORTH EMGOLD	2424753	16-Mar-21	54.15	\$ 65.25
TROILUS NORTH EMGOLD	2424754	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424755	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424756	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424757	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424758	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424759	16-Mar-21	54.14	\$ 65.25
TROILUS NORTH EMGOLD	2424760	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424761	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424762	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424763	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424764	16-Mar-21	54.13	\$ 65.25
TROILUS NORTH EMGOLD	2424765	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424766	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424767	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424768	16-Mar-21	54.12	\$ 65.25
TROILUS NORTH EMGOLD	2424769	16-Mar-21	54.12	\$ 65.25



Property	Claim	Expiry Date	Area (ha)		Fees
TROILUS NORTH EMGOLD	2424770	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424771	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424772	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424773	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424774	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424775	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424776	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424777	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424778	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424779	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424780	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424781	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424782	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424783	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424784	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424785	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424786	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424958	16-Mar-21	54.17	\$	65.25
TROILUS NORTH EMGOLD	2424959	16-Mar-21	54.17	\$	65.25
TROILUS NORTH EMGOLD	2424960	16-Mar-21	54.17	\$	65.25
TROILUS NORTH EMGOLD	2424961	16-Mar-21	54.16	\$	65.25
TROILUS NORTH EMGOLD	2424962	16-Mar-21	54.16	\$	65.25
TROILUS NORTH EMGOLD	2424963	16-Mar-21	54.16	\$	65.25
TROILUS NORTH EMGOLD	2424964	16-Mar-21	54.16	\$	65.25
TROILUS NORTH EMGOLD	2424965	16-Mar-21	54.16	\$	65.25
TROILUS NORTH EMGOLD	2424905	16-Mar-21	54.10 54.16	\$	65.25
TROILUS NORTH EMGOLD	2424900 2424967	16-Mar-21	54.10 54.16	\$	65.25
TROILUS NORTH EMGOLD	2424907 2424968	16-Mar-21	54.10 54.15	\$	65.25
TROILUS NORTH EMGOLD	2424908	16-Mar-21	54.15 54.15	\$	65.25
		16-Mar-21		\$	65.25
TROILUS NORTH EMGOLD	2424970	16-Mar-21	54.15	Ψ \$	65.25
TROILUS NORTH EMGOLD	2424971	16-Mar-21	54.15	Ψ \$	65.25
	2424972	16-Mar-21	54.15	φ \$	65.25
TROILUS NORTH EMGOLD	2424973	16-Mar-21	54.14	φ \$	65.25
TROILUS NORTH EMGOLD	2424974		54.14		
TROILUS NORTH EMGOLD	2424975	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2424976	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2424977	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2424978	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2424979	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2424980	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2424981	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2424982	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2424983	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424984	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424985	16-Mar-21	54.11	\$	65.25



Property	Claim	Expiry Date	Area (ha)		Fees
TROILUS NORTH EMGOLD	2424986	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424987	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2424988	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424989	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424990	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424991	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424992	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2424993	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424994	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424995	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424996	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424997	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2424998	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2424999	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2425000	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2425001	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2425002	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2425003	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2425004	16-Mar-21	54.12	\$	65.25
FROILUS NORTH EMGOLD	2425005	16-Mar-21	54.12	\$	65.25
ROILUS NORTH EMGOLD	2425005	16-Mar-21	54.12	\$	65.25
ROILUS NORTH EMGOLD	2425000	16-Mar-21	54.12	\$	65.25
ROILUS NORTH EMGOLD	2425007	16-Mar-21	54.11	\$	65.25
ROILUS NORTH EMGOLD	2425008 2425009	16-Mar-21	54.11	\$	65.25
ROILUS NORTH EMGOLD	2425009	16-Mar-21	54.11	\$	65.25
ROILUS NORTH EMGOLD	2425010	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2425011	16-Mar-21	54.11 54.11	Ψ \$	65.25
		16-Mar-21		Ψ \$	65.25
	2425013	16-Mar-21	54.11	φ \$	65.25
	2425014		54.10	Ψ \$	65.25
FROILUS NORTH EMGOLD	2425015	16-Mar-21	54.10		
FROILUS NORTH EMGOLD	2425016	16-Mar-21	54.10	\$	65.25
FROILUS NORTH EMGOLD	2425017	16-Mar-21	54.10	\$	65.25
FROILUS NORTH EMGOLD	2425018	16-Mar-21	54.10	\$	65.25
FROILUS NORTH EMGOLD	2425019	16-Mar-21	54.10	\$	65.25
FROILUS NORTH EMGOLD	2425020	16-Mar-21	54.10	\$	65.25
FROILUS NORTH EMGOLD	2425021	16-Mar-21	54.09	\$	65.25
FROILUS NORTH EMGOLD	2425022	16-Mar-21	54.09	\$	65.25
FROILUS NORTH EMGOLD	2425023	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2425024	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2425025	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2425026	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2425027	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2425028	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425029	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425030	16-Mar-21	54.08	\$	65.25



Property	Claim	Expiry Date	Area (ha)		Fees
TROILUS NORTH EMGOLD	2425031	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425032	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425033	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425034	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425035	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425036	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2425037	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2488059	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2488138	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2488294	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2488295	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2488296	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2488297	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2491523	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2491524	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2491525	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2491526	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2491527	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2499212	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499213	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499214	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499215	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499216	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499217	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499218	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2499219	16-Mar-21	54.07	\$	65.25
TROILUS NORTH EMGOLD	2499220	16-Mar-21	54.07	\$	65.25
TROILUS NORTH EMGOLD	2499221	16-Mar-21	54.07	\$	65.25
TROILUS NORTH EMGOLD	2499222	16-Mar-21	54.07	\$	65.25
TROILUS NORTH EMGOLD	2499223	16-Mar-21	54.06	\$	65.25
TROILUS NORTH EMGOLD	2500001	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2500001	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2500002	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2500003	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2500004 2502354	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2502354 2502355	16-Mar-21	54.07 54.07	\$	65.25
TROILUS NORTH EMGOLD	2502355	16-Mar-21	54.07 54.07	\$	65.25
TROILUS NORTH EMGOLD	2502350	16-Mar-21	54.07 54.07	\$	65.25
TROILUS NORTH EMGOLD		16-Mar-21		\$	65.25
	2502358	16-Mar-21	54.07	Ψ \$	65.25
	2502359	16-Mar-21	54.07	э \$	65.25
TROILUS NORTH EMGOLD	2502360	16-Mar-21	54.06	ъ \$	65.25
TROILUS NORTH EMGOLD	2502361	16-Mar-21	54.06	ъ \$	65.25
TROILUS NORTH EMGOLD	2502362	16-Mar-21	54.06	ъ \$	65.25
TROILUS NORTH EMGOLD	2502363		54.06		
TROILUS NORTH EMGOLD	2502364	16-Mar-21	54.06	\$	65.25



Property	Claim	Expiry Date	Area (ha)		Fees
TROILUS NORTH EMGOLD	2502365	16-Mar-21	54.06	\$	65.25
TROILUS NORTH EMGOLD	2504200	16-Mar-21	54.14	\$	65.25
TROILUS NORTH EMGOLD	2504201	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2504202	16-Mar-21	54.13	\$	65.25
TROILUS NORTH EMGOLD	2504203	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2504204	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2504205	16-Mar-21	54.12	\$	65.25
TROILUS NORTH EMGOLD	2504206	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2504207	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2504208	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2504209	16-Mar-21	54.11	\$	65.25
TROILUS NORTH EMGOLD	2504210	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2504211	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2504212	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2504213	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2504214	16-Mar-21	54.10	\$	65.25
TROILUS NORTH EMGOLD	2504215	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2504216	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2504217	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2504218	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2504219	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2504220	16-Mar-21	54.09	\$	65.25
TROILUS NORTH EMGOLD	2504221	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504222	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504223	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504224	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504225	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504226	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504227	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504228	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504229	16-Mar-21	54.08	\$	65.25
TROILUS NORTH EMGOLD	2504230	16-Mar-21	54.08	\$	65.25
Total: 209 claims			11,308.76	\$13	3,637.25

## TABLE 30-3 LIST OF TROILUS NORTH O3 PROPERTY CLAIMS Troilus Gold Corp. - Troilus Gold-Copper Project

Property	Claim	Expiry Date	Area (ha)	Fees
<b>TROILUS NORTH O3</b>	2422145	02-Feb-21	54.13	\$ 65.25
TROILUS NORTH O3	2422146	02-Feb-21	54.13	\$ 65.25
TROILUS NORTH O3	2422147	02-Feb-21	54.12	\$ 65.25
Total: 3 claims	<b>i</b>		162.38	\$ 195.75