# NI 43-101 TECHNICAL REPORT, GEOLOGICAL INTRODUCTION TO EMPEROR METAL INC.'S PINE GROVE PROPERTY, ONTARIO, CANADA



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BAYSIDE GEOSCIENCE INC.

Steven D. Flank, P.Geo Effective Date: June 23<sup>rd</sup>, 2021 Signing Date: June 23<sup>rd</sup>, 2021

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# 1 Summary

### 1.1 Issuer and Purpose

Emperor Metals Inc. ("Emperor" or the "Company") is an Edmonton, Alberta, Canada, based, privately owned, junior mineral exploration company. Emperor signed a purchase agreement with Mr. John Florek, dated October 6<sup>th</sup>, 2020, and amended December 7, 2020, that gives the Company an undivided 100 per cent (%) right, title and interest in the Pine Grove Property (the "Property") and all the information relating to the Property. The Pine Grove Property is located approximately 40 kilometres (km) east-northeast of Marathon, Ontario, Canada. The Property comprises 85 cell claims encompassing an area of approximately 1,317 hectares (3,254 acres).

The Pine Grove Property is situated within the Archean Schreiber-Hemlo greenstone belt in the Wawa-Abitibi Terrane of the central Superior Province of the Canadian Shield. The Property lies 13 km north-northeast of the Hemlo Gold Deposit, a world-class Archean disseminated-replacement-stockwork gold deposit that has produced in excess of 21 million ounces of gold and contains 4.4 million ounces of gold in Reserves and in combined Measured and Indicated Mineral Resources (Barrick Gold Corp., 2020).

This Technical Report on the Pine Grove Property has been prepared by Mr. Steven Flank of Bayside Geoscience Inc. ("Bayside"), Thunder Bay, Ontario, Canada to provide a geological introduction to the Pine Grove Property, to summarize historical work conducted on the Property from 1965 to 2017 and to provide recommendations for future exploration programs. This report has been prepared in accordance with National Instrument 43-101, Companion Policy NI 43-101CP and Form 43-101F. The effective date of this Technical Report is May 1<sup>st</sup>, 2021.

### 1.2 Author and Qualified Person Site Inspection

Mr. Steven Flank, M.Sc., P.Geo., was engaged by Emperor to prepare an Independent Technical Report for the Property. The Technical Report is compliant with National Instrument 43-101, companion policy NI 43-101CP and Form 43-101F. Mr. Flank serves as the Independent Qualified Person ("QP") in accordance with Section 1.5 of NI 43-101CP (Companion Policy) in that there is no circumstance that, in the opinion of a reasonable person aware of all relevant facts, could interfere with the QP's judgment regarding the preparation of the Technical Report. Mr. Flank is a member in good standing with the Association of Professional Geoscientists of Ontario (APGO #2695) who has 10 years of experience focussed on grassroots and advanced exploration projects. Mr. Flank has managed exploration projects exploring for Archean Lode Gold deposits in the Abitibi greenstone belt in Ontario as well as nickel (Ni) – copper (Cu) - platinum group elements (PGE) projects within the Midcontinent Rift in Ontario. The Statement of Qualifications for the QP is presented in the signed Certificate of the Author found in Section 28.

The QP's scope of work entailed reviewing available historical information and completing a Property site visit. Mr. Flank conducted a site visit to the Pine Grove Property

on May 1<sup>st</sup>, 2021. Mr. Flank was accompanied by Mr. Robert Ferner of APEX Geoscience who helped navigate the Property to suspected locations of historical mineral showings. During the site visit a total of 11 surface grab samples were collected from historical mineral occurrences documented by previous workers and the Ontario Geological Survey. Rock samples taken from a roadside outcrop are comprised of similar mineralogy and mineralization styles as the Turner showing, as described in the Mineral Deposit Inventory of the Ministry of Northern Development and Mines. The Jenny Creek gold (Au) - zinc (Zn) showing was located proximal to its documented location as recorded in the Mineral Deposit Inventory and was comprised of sulfidic high-stain zones within banded iron formation and amphibolite. Additionally, a historical trench was located, and a single sample taken from a hematite and epidote altered shear zone. The author's sampling confirmed zinc and copper mineralization at the Turner occurrence, zinc mineralization at the Jenny Creek occurrence and weakly anomalous gold mineralization at the Turner and Jenny Creek occurrences. The weakly anomalous gold mineralization does not confirm the historical gold results of these mineral occurrences; however, the author recommends additional sampling and prospecting to fully assess the mineralization potential of these prospects.

The Property is at an early-stage of exploration. During the site visit the author was able to examine geology, mineralized outcrops on the Property and historical trenches. In consideration of this and the available historical data the author can conclude that the Property is an early-stage exploration "Property of Merit".

### 1.3 Property Location and Description

The Pine Grove Property is located in northwestern Ontario (ON), Canada, approximately 40 km east-northeast of Marathon, ON and 30 km south of Manitouwadge, ON. It is situated in the Wabikoba Lake area (NTS 42C13SW) and extends north into the adjacent Black River area (NTS 42C13NW) which lie in the Thunder Bay Mining Division. The Property is centered at approximately 582,367m E and 5,410,640m N (Universal Transverse Mercator Zone 16, North American Datum 83). The Property comprises 85 cell claims covering an area of 1,317 ha (3,254 acres). The claims are 100% owned by Emperor Metals Inc. The claims are active and in good standing.

The Company signed a purchase agreement with John Florek for a 100% interest in the Property for a payment of 3,000,000 shares at a deemed per share price of CDN\$0.10. The claims are subject to a royalty (the "NSR Royalty") in the amount of 2% of Net Smelter Returns (the "NSR"). The Company retained the right to purchase 1.5% of the NSR Royalty for an aggregate purchase price of CDN\$1,500,000 payable in cash. The agreement allows Emperor to reduce the NSR Royalty by intervals of 0.5% of the NSR for a payment of CDN\$500,000 down to a residual of 0.5%.

### 1.4 Access

From Marathon, ON, the Pine Grove Property can be reached by travelling 40 km east along Trans-Canada Highway/Ontario Highway 17 South and 16 km north on Highway

614. Highway 614 crosses the top two thirds of the Property, from south to north. The Pinegrove Road, an all-weather forest access road, runs east from Highway 614 and provides access to numerous log-haul roads that run throughout the Property.

### 1.5 Historical Exploration

Exploration in the Hemlo Mining District dates back to 1869 with the discovery of gold showings near the town of Heron Bay, located approximately 30 km southwest of the Pine Grove Property. Since then, numerous exploration programs have been conducted in the Hemlo Mining District and in the area of the Pine Grove Property. Work completed on the Property has included geological mapping, geochemical sampling, geophysical surveying and diamond drilling. Ten diamond drillholes, totalling 648.8 m, have been completed on the Pine Grove Property between 1967 and 1997. The bulk of the exploration in the general Property area was completed by Carravelle Mines Ltd. (1965-1967), Noranda Exploration Company Ltd. and Noranda Minerals Inc. Geco Division (1983-1985, 1991-1992), Homestake Mineral Development Company (1983-1984), Key Lake Exploration Ltd. (1983), Chavin of Canada Ltd. (1983), Dolphin Explorations Ltd. (1987), Albert Turner (1991-1997), Hemlo Gold Mines (Exploration) Inc. (1994-1995), Entourage Metals Ltd. (2011-2012) and Tashota Resources Inc. (2016-2017). A recent Time Domain Electromagnetic and Magnetic (TDEM) airborne geophysical survey completed by Tashota Resources Inc. (Tashota) in 2016 identified four highly prospective areas where weak EM anomalies are associated with strong and discrete magnetic anomalies and are located near inferred structural features. These areas remain untested.

### 1.6 Current Exploration

Emperor commissioned a ground geophysical survey that was completed over the Pine Grove Property between April 6<sup>th</sup> and May 3<sup>rd</sup>, 2021. The survey totalled 196.34 linekm and provided high-resolution magnetics data over the entire Pine Grove Property. Interpretation of the survey data is currently underway.

### 1.7 Geology and Mineralization

Emperor's Pine Grove Property is situated in the eastern half of the Archean Schreiber-Hemlo greenstone belt within the Wawa-Abitibi Terrane of the central Superior Province of the Canadian Shield. The eastern portion of the Schreiber-Hemlo greenstone belt is the Hemlo section and is known as the Hemlo greenstone belt. The Hemlo greenstone belt is a synclinorium containing tholeiitic mafic volcanic rocks and metasedimentary supracrustal rocks, which are sandwiched between the Pukaskwa Gneissic Complex to the south and the Black-Pic Batholith/Gowan Lake Pluton to the north. The eastern side of the Hemlo greenstone belt is composed predominately of turbiditic wacke to mudstone with minor conglomerate, intruded by granodiorites of the Heron Bay Pluton and the Cedar Lake Pluton, and phases of post-Archean diabase dykes.



The local geology of the Property comprises predominately northeast trending sequences of Archean metavolcanic and metasedimentary lithologies, bound to the west and to the north by Early Silicic plutonic rocks of the Black-Pic Batholith and the Gowan Lake Pluton. Six major rock units are identified on the Property: 1) mafic to intermediate metavolcanics; 2) intermediate to silicic metavolcanics, pyroclastic rocks and metasediments; 3) metasediments; 4) early silicic plutonic rocks; 5) late silicic plutonic rocks; and 6) diabase dykes. The metavolcanic, pyroclastic and metasedimentary rocks are highly metamorphosed and have undergone complex folding.

Three mineral occurrences occur within the Pine Grove Property and include, from north to south, Jenny Creek, Turner and Brinklow. Gold and zinc mineralization at the Jenny Creek occurrence is hosted in banded iron formations with disseminated pyrite and pyrrhotite and in altered mafic flows. The Turner occurrence is located 500 metres (m) south of the Jenny Creek occurrence. Mineralization of Zn, Au and silver (Ag) at the Turner occurrence is hosted in garnetiferous mafic schist with disseminated pyrite and pyrrhotite. The Brinklow occurrence in the southwest corner of the Property hosts molybdenum (Mo) and Ag mineralization in sheared pyrrhotitic felsic to lapilli tuff with occasional sphalerite stringers. Rock sampling and drilling highlights from the occurrences include:

- Jenny Creek: up to 0.43% Zn, 1.2 parts per million (ppm) Au, 32.91 ppm Ag and 291 ppm Cu
- Turner: up to 8.23 grams per tonne (g/t) Au and 0.41 and 0.69% Zn
- Brinklow: up to 238 ppm Mo and 4.9 ppm Ag over 1.96 m from drillhole 83 B-8. Drillhole 83 B-8 is located off-Property, 20 m to the west of the Pine Grove Property.
- 1.8 Conclusions and Recommendations

Based upon a review of available information, historical data and the author's recent site visit, the Qualified Person considers the Property prospective for the discovery of disseminated-replacement-stockwork gold deposits, similar to Barrick Gold Corporation's Hemlo deposit, as well as intrusion related gold mineralization and structurally hosted shear zone type gold mineralization.

The Pine Grove Property lies in a favourable geological setting, in close proximity to the world-class Hemlo Gold Deposit, in an area supported by a skilled labour force with over 30-years of mining experience. Historical exploration on the Pine Grove Property has identified several areas of anomalous mineralization associated with geophysical anomalies. Key highlights include:

• Entourage Metal Ltd.'s 2012 B-horizon soil sampling program highlighted an anomalous area (up to 1,800 parts per billion [ppb] Au) near the contact of Archean metasedimentary and silicic plutonic rocks in the southwestern

Property area. Three anomalous samples (>100 ppb Au) were collected over mafic to intermediate metavolcanics in the northern Property area and correlate to geophysical anomalies outlined in Tashota's 2016 high-resolution airborne TDEM survey. Furthermore, two anomalous samples (>100 ppb Au) were collected along the Jenny Creek Fault, near the interpreted intersection with the Pine Grove Lake Fault. The clustered and trending patterns of the anomalous soil samples suggest underlying bedrock and/or structural control of the mineralization.

- Historical geophysical surveys over the Property have identified several IP and TDEM anomalies within the Property, with four of the TDEM anomalies highlighted by Tashota's 2016 survey corresponding to weak electromagnetic anomalies spatially associated with strong and discrete magnetic anomalies near interpreted structural zones. The majority of the anomalies remain untested by historical work.
- Gold mineralization of up to 8.23 g/t Au in historical sampling in mafic volcanic rocks collected near the Turner occurrence, in proximity to the structural intersection of the Jenny Creek and Pine Grove Lake faults.
- Results of up to 0.43% Zn, 1.2 ppm Au, 32.91 ppm Ag and 291 ppm Cu in banded iron formation at the Jenny Creek occurrence.

Based upon the author's site visit and the historical exploration work discussed in this Technical Report, it is the opinion of the author that the Pine Grove Property is a "Property of Merit" warranting future exploration work. The author is unaware of any unusual risk factors, other than those normally associated with mineral exploration, that might affect future exploration work and potential development of the Property.

A staged exploration approach is recommended to follow-up on historical anomalies. A Phase 1 program should include ground geophysical surveying, data compilation, geological mapping, prospecting and geochemical sampling. During Phase 1a a ground geophysical surveying program should be completed that includes IP and magnetic surveying, to further identify and define targets for future drill testing. The estimated cost of the Phase 1a program including contingencies is CDN\$100,000. As part of Phase 1a, a ground magnetics survey was completed in May 2021 for a total cost of ~\$80,000. The IP survey recommended as part of Phase 1a remains to be completed. The Phase 1b program should include a comprehensive compilation and validation of historical data, reprocessing, including line by line inversions, re-interpretation of the 2016 heliborne TDEM geophysical survey data along with geological mapping, rock sampling and soil sampling. The cost of the as Phase 1b program with contingencies is estimated to be CDN\$100,000. Geological mapping should be completed, with an emphasis on mapping structural zones, alteration and lithology, with the results of the mapping used to prioritize rock, soil and ground geophysical surveys over geologically prospective targets. Soil sampling including Mobile Metal Ion (MMI) surveys or Ionic Leach geochemistry should be completed in areas of the Property covered by thick overburden. The remainder of the Property not

covered by the 2012 soil sampling program should be covered with conventional soil samples.

Phase 2 exploration is dependent on the results of Phase 1 and includes a diamond drilling program with associated ground preparation work and a LiDAR survey. The recommended drilling at Pine Grove will test targets generated in Phase 1. A preliminary recommendation of 2,000 m of diamond drilling is recommended at the Pine Grove Property. The estimated cost of the Phase 2 drill program is CDN\$625,000. A LiDAR survey (light detection and ranging) coupled with photogrammetry using unmanned aerial vehicles (UAVs) is recommended to generate a detailed digital elevation model for the Property. The estimated cost of the LiDAR survey is CDN\$50,000. The estimated total cost of the Phase 2 program is CDN\$675,000 not including GST.

The cost of the Phase 1 and Phase 2 work is estimated at CDN\$200,000 and CDN\$675,000, respectively not including GST. Phase 2 is dependent upon the results of the recommended Phase 1 work program. Collectively, the work recommendations have a total estimated cost of CDN\$875,000, including contingency funds but not GST.

## 2 Introduction

### 2.1 General

Emperor Metals Inc. ("Emperor" or the "Company") is an Edmonton, Alberta, Canada, based, privately owned, junior mineral exploration company. Emperor recently signed a purchase agreement with Mr. John Florek, dated October 6th, 2020, amended December 7, 2020, that gives the Company an undivided 100 per cent (%) right, title and interest in the Pine Grove Property (the "Property") and all the information relating to the Property for a payment of 3,000,000 shares at a deemed per share price of CDN\$0.10. The claims are subject to a royalty (the "NSR Royalty") in the amount of 2% of Net Smelter Returns (the "NSR"). The Company retained the right to purchase 1.5% of the NSR Royalty for an aggregate purchase price of CDN\$1,500,000 payable in cash. The agreement allows Emperor to reduce the NSR Royalty by increments of 0.5% of the NSR for a payment of CDN\$500,000 per increment down to a minimum residual of 0.5% NSR.

The Pine Grove Property is located approximately 40 km east-northeast of Marathon, ON, Canada (Figure 2.1) and 13 km north-northeast of the Hemlo Gold Deposit. The Hemlo Gold Deposit is an Archean disseminated-replacement-stockwork gold deposit that has produced in excess of 21 million ounces of gold and contains 4.4 million ounces of gold in Reserves and in combined Measured and Indicated Mineral Resources (Barrick Gold Corp., 2020). The Pine Grove Property encompasses approximately 1,317 hectares (3,254 acres) of land within the Archean Schreiber-Hemlo greenstone belt in the Wawa-Abitibi Terrane of the central Superior Province of the Canadian Shield.

This Technical Report has been prepared by Mr. Steven Flank of Bayside Geoscience Inc. ("Bayside") to provide a geological introduction to the Pine Grove Project, to summarize historical work conducted on the Property from 1965 to 2017 and to provide recommendations for future exploration programs.

The Technical Report has been prepared in accordance with the Canadian Securities Administration's (CSA's) National Instrument 43-101 (NI 43-101) Standards of Disclosure for Mineral Projects and guidelines for technical reporting Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Best Practices and Reporting Guidelines" for disclosing mineral exploration. The effective date of this Technical Report is May 1<sup>st</sup>, 2021.



Figure 2.1. General location of Emperor Metal's Pine Grove Property.

### 2.2 Author and Site Inspection

The author of this Technical Report is Mr. Steven D. Flank, M.Sc, P.Geo of Bayside Geoscience Inc. Mr. Flank is independent of Emperor and is a Qualified Person as defined by the CSA's NI 43-101 which defines a Qualified Person as "an individual who is a geoscientist with a university degree or equivalent; with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these; has experience relevant to the subject matter of the mineral project and the technical report; and is a member in good standing of a professional association."

Mr. Flank takes responsibility for the preparation and publication of all sections of this Technical Report. Mr. Flank is a Professional Geologist with the Professional Geoscientists of Ontario (PGO) and has worked as an exploration geologist for 11 years. Mr. Flank completed a B.Sc at Lakehead University and an M.Sc in Mineral Exploration at Laurentian University. Mr. Flank's work has focussed on project generation for multiple commodities including gold, copper and nickel-copper-platinum group elements. Mr. Flank's experience in gold exploration has focussed on Archean lode gold deposits in the prolific Abitibi Greenstone belt where his responsibilities included evaluating early-stage projects by completing prospecting, geological mapping and diamond drilling programs.

Mr. Flank conducted a site visit to the Pine Grove Property on May 1<sup>st</sup>, 2021. Mr. Flank was accompanied by Mr. Robert Ferner of APEX Geoscience Ltd. who helped navigate the Property to suspected locations of historical mineral showings. During the site visit the author completed traverses on the Property to locate the historical Turner and Jenny Creek showings. He also traversed along an overgrown trail and located a historical trench completed by Hemlo Gold Mines in 1995. Historical location references for the Turner showing were found to be incorrect but with the aid of a historical map the likely location of the occurrence was located and sampled. During the site visit a total of 11 surface grab samples were collected from historical mineral occurrences documented by previous workers and the Ontario Geological Survey. Rock samples taken from a roadside outcrop are comprised of similar mineralogy and mineralization styles as the Turner showing, as described in the Mineral Deposit Inventory of the Ministry of Northern Development and Mines. The Jenny Creek gold - zinc (Au-Zn) showing was located proximal to its documented location as recorded in the Mineral Deposit Inventory and was comprised of sulfidic high-stain zones within banded iron formation and amphibolite. Additionally, a historical trench was located, and a single sample taken from a hematite and epidote altered shear zone. The author's sampling confirmed zinc and copper mineralization at the Turner occurrence, zinc mineralization at the Jenny Creek occurrence and weakly anomalous gold mineralization at the Turner and Jenny Creek occurrences. The weakly anomalous gold mineralization does not confirm the historical gold results of these mineral occurrences; however, the author recommends additional sampling and prospecting to fully assess the mineralization potential of these prospects.

The Property is at an early-stage of exploration. During the site visit the author was able to examine geology, mineralized outcrops on the Property and historical trenches

consistent with historical documentation of mineral occurrences. In consideration of this and the available historical data the author concludes that the Property is an early-stage exploration "Property of Merit".

2.3 Sources of Information

A complete bibliography of all references cited in this Technical Report is presented in Section 27. The author has reviewed soil and rock geochemistry, geophysical data and reports, and drilling results from numerous assessment reports filed as reports of work with the Ontario Ministry of Energy, Northern Development and Mines (e.g., Bowdidge, 2016; Carravelle Mines Ltd., 1969; Charlton, 1992; Florek and Boucher, 2012; Gagnon, 1985; Lockwood, 1993; Londry, 1995a; Londry 1995b; Page, 1984; Richardson, 1983; Sears, 1988; Staargaard, 1984a; Staargaard, 1984b; Sutherland, 1983; Turner, 1994a; Turner, 1994b; Turner, 1997; Walmsley, 1991). Government publications and journal manuscripts were used to verify background geological information regarding the regional and local geological setting and mineral deposit potential of the Pine Grove Property and area. Selected references for these sources of information categories include:

- Government publications (e.g., Magnus, 2019; McKay, 1994; Milne, 1967; Muir, 2000; Williams et al., 1991)
- Journal manuscripts (e.g., Dubé and Gosselin, 2007; Kusky and Polat, 1999; Muir, 2002; Percival, 2007; Percival et al., 2012; Robert et al., 2007; Robert et al., 1991; Schneiders and Smyk, 1991; Sillitoe and Thompson, 1998; Thompson et al., 1999)

The author has reviewed all government and miscellaneous reports and has deemed that these reports and information, to the best of his knowledge, are valid contributions. The information was used as background information to provide a geological introduction to the Pine Grove Property. The author takes ownership of the ideas and values as they pertain to this Technical Report.

### 2.4 Units of Measure

With respect to units of measure, unless otherwise stated, this Technical Report uses:

- Abbreviated shorthand consistent with the International System of Units (International Bureau of Weights and Measures, 2006);
- 'Bulk' weight is presented in both United States short tons ("tons"; 2,000 lbs or 907.2 kg) and metric tonnes ("tonnes"; 1,000 kg or 2,204.6 lbs.);
- Units of measure include parts per million (ppm) equivalent to grams per tonne (g/t) and parts per billion (ppb).

- Geographic coordinates are projected in the Universal Transverse Mercator ("UTM") system relative to Zone 16 of the North American Datum ("NAD") 1983; and,
- Currency in Canadian dollars (CDN\$), unless otherwise specified (e.g., U.S. dollars, US\$; Euros, €).

# 3 Reliance of Other Experts

This Technical Report was prepared by the author for Emperor. The author has relied upon documents provided by Mr. John Florek and Emperor, regarding information about the corporate structure, ownership and titles of the Pine Grove Property, as described in Sections 1, 2 and 4 of this Technical Report. There has been no title opinion nor is the author able to provide a title opinion. However, the claims information provided by Mr. Florek and the Company was reviewed and verified by the author against the Ontario Mining Lands Administration System (MLAS) claims listing on May 18, 2021 and found to be accurate. Mr. Florek provided confirmation via email dated March 4, 2021 that 100% ownership of the Pine Grove claims has been transferred to Emperor Metals Inc. on March 4, 2021.

## 4 Property Description and Location

### 4.1 Description and Location

The Pine Grove Property is located in northwestern Ontario, Canada, approximately 40 kilometres east-northeast of Marathon, ON and 30 kilometres south of Manitouwadge, ON. It is situated in the Wabikoba Lake area (NTS 42C13SW) and extends north into the adjacent Black River area (NTS 42C13NW) which lie in the Thunder Bay Mining Division. The Property is centered at approximately 582,367m E and 5,410,640m N (UTM Zone 16, NAD 83).

The Property comprises 85 cell claims covering an area of 1,317 hectares (3,254 acres). The claims are listed in Table 4.1 and shown on Figure 4.1. The claims are 100% owned by Emperor Metals Inc. The claims are active and in good standing. A total of 82 claims have anniversary dates of February 12, 2022, and three claims (Tenure No. 109854, 136661, and 238582) have expiry dates of October 29, 2021.

Mineral claims in Ontario are acquired and managed within the online Mining Lands Administration System (MLAS). Individual unpatented mining claims are referred to as a Boundary Cell Mining Claim or a Single Cell Mining Claim (referred to collectively as "mining claims" within this report). In 2018 Ontario moved to an online claim registration system based on a provincial grid. All mining claims in Ontario, which existed prior to the modernization (now known as "legacy claims") were converted to cell claims or boundary claims. A cell claim is a mining claim that relates to all of the land included in one or more cells on the provincial grid. A boundary claim is a claim that is made up of only a part, or parts, of one or more cells. Boundary claims were created in two circumstances: if the holder of record applied to keep the legacy claims separate from each other; or if there were two legacy claims held by separate owners within one cell.

For the Pine Grove Property annual assessment work requirements for Boundary Cell and Single Cell mining claims are \$200 and \$400 per claim, respectively. The Pine Grove Property comprises 41 boundary cell mining claims and 44 single cell mining claims (Table 4.1). The Property is subject to annual assessment work requirements of \$25,800. To keep the claims in good standing an assessment report supporting the expenditure must be submitted by the expiry date. Approved credits can be distributed to contiguous mining claims to maintain those claims in good standing. Payment in lieu of work equivalent to the current year's required assessment work may be made to maintain a claim in good standing for one year. Payment must be made on or before the due date of the claims.

Tenure number	Mining Claim Type	Tenure Status	Issue Date	Anniversary Date	Holder	Area (Ha)
102399	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	7.37
108924	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	14.05
108925	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
109854	Single Cell Mining Claim	Active	2018-04-10	2021-10-29	EMPEROR METALS INC.	21.25
109855	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	4.96
128430	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.39
131021	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	13.73
131022	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
131023	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.05
136661	Single Cell Mining Claim	Active	2018-04-10	2021-10-29	EMPEROR METALS INC.	21.25
137776	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.23
138794	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	15.00
138795	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
143237	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.23
144256	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	14.68
148236	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
153097	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	16.02
156373	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
156374	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	7.05
156375	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
162459	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	7.69
162460	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
162461	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
162462	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
175825	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
183000	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
185523	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	19.19
188669	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	15.29
190765	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
190766	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
190767	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
190768	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	16.96
190946	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	18.04
191844	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
192563	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
209970	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.23
221505	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.80
221745	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
221746	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
225301	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	2.16
225302	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	18.57
238581	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.23

# Table 4.1. Permit descriptions and status for Pine Grove Property (downloaded from MLAS March 1, 2021).

238582	Single Cell Mining Claim	Active	2018-04-10	2021-10-29	EMPEROR METALS INC.	21.23
238602	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
238603	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
239446	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	8.35
241885	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
241886	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
242942	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.17
246938	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	6.30
250981	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	17.90
252819	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	18.88
255331	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
257975	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	1.99
258421	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
258422	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
263017	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
263018	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	20.99
275809	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
275810	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	6.08
275930	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.23
275931	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	3.63
276936	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	1.28
276937	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
279499	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	17.72
286092	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
292579	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
295813	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	1.90
304735	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	10.44
305236	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.23
306775	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
313508	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
325019	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	1.59
325020	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.25
325021	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
325022	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.24
325273	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	11.82
325274	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	4.25
325275	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	3.94
334677	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.31
334678	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	0.16
338414	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25
338415	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	17.59
338416	Boundary Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	13.41
344133	Single Cell Mining Claim	Active	2018-04-10	2022-02-12	EMPEROR METALS INC.	21.25



Figure 4.1. Pine Grove Property Claims Overview

In April 2020, the Ministry of Energy, Northern Development and Mines allowed all claim holders in Ontario to apply for an exclusion order for all claims with anniversary dates on or before December 31, 2020. The exclusion orders removed the requirement to carry out assessment work for a period of time of up to 12 months effectively providing an extension to completing assessment work. An exclusion order has been approved for all claims comprising the Pine Grove Property.

### 4.2 Royalties and Agreements

Emperor Metals Inc. entered into a purchase agreement dated October 6<sup>th</sup>, 2020, amended December 7, 2020 with Mr. John Florek to obtain an undivided 100% right, title and interest in the Pine Grove Property and all information relating to the Property for a payment of 3,000,000 shares at a deemed per share price of \$0.10. The claims are subject to a royalty (the "NSR Royalty") in the amount of 2% of Net Smelter Returns (the "NSR"). Mr. Florek transferred 100% ownership of the Pine Grove claims to Emperor Metals Inc. on March 4, 2021.

Emperor retained the right to purchase the 1.5% of the NSR Royalty for an aggregate purchase price of \$1,500,000 payable in cash. The agreement allows Emperor to reduce the NSR Royalty by increments of 0.5% of the NSR for a payment of \$500,000 for each increment down to a minimum residual NSR of 0.5%.

## 4.3 Environmental Liabilities, Permitting and Significant Factors

The author is not aware of any environmental liabilities to which the Property is subject. MNDM maintains the Abandoned Mines Information System (AMIS), which includes information on abandoned and inactive mines throughout Ontario. One site is located on the Pine Grove Property and is summarized in Section 6, History. Emperor is not liable for any pre-existing environmental issues associated with the Property related to this historical mine feature. At the time of this Report, the author is not aware of any significant factors or risks that may affect access, title, the right or ability to perform work on the Property.

The exploration on the Pine Grove Property is subject to the guidelines, policies and legislation of the Ontario Ministry of Energy, Northern Development and Mines, Ontario Ministry of Natural Resources and Forestry, and Federal Department of Fisheries and Oceans regarding surface exploration, stream crossings, and work being carried out near rivers and bodies of water, drilling and sludge disposal, drill casings, capping of holes, storage of core, trenching, road construction, waste and garbage disposal.

Ontario's Mining Act (R.S.O. 1990, Chapter M. 14) is the provincial legislation that governs and regulates prospecting, mineral exploration, mine development and rehabilitation in the province. The purpose of the Act is to encourage prospecting, online mining claim registration and exploration for the development of mineral resources, in a manner consistent with the recognition and affirmation of existing Aboriginal and treaty rights in Section 35 of the Constitution Act, 1982.

For exploration activities apart from prospecting, mapping and surface sampling, an exploration plan or permit must be obtained from the Ministry of Energy, Northern Development and Mines (MNDM). There is an active exploration permit over the Pine Grove Property that expired in March 2021; however, this exploration permit can be renewed for one year due to extensions granted by the MNDM in response to the COVID-19 pandemic.

Exploration activities are prohibited during the First Nations Traditional Moose Hunt in the fall (October/November). Aboriginal communities potentially affected by activities proposed in an exploration plan are notified by the Ministry of Energy, Northern Development and Mines (ENDM) and have an opportunity to provide feedback before the proposed activities can be carried out. Historically no issues have been raised by nearby aboriginal communities. Processing periods are 50 days for a permit and 30 days for a plan.

# 5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

## 5.1 Accessibility

The Pine Grove Property is located in northwestern Ontario, Canada, approximately 40 kilometres east-northeast of Marathon, ON and 30 kilometres south of Manitouwadge, ON. Primary access to the Property is available via Ontario Highway 614 (Figure 5.1). From Marathon, ON, the Pine Grove Property can be reached by travelling 40 km east along Trans-Canada Highway/Ontario Highway 17 South and 16 km north on Highway 614. Highway 614 crosses the top two thirds of the Property, from south to north. The Pinegrove Road, an all-weather forest access road, runs east from the highway and provides access to numerous log-haul roads that run throughout the Property. Additionally, the abandoned Canadian Pacific Spur railway can be used for all terrain vehicle travel throughout the Property area.

### 5.2 Site Topography, Elevation and Vegetation

Physiography at the Pine Grove Property is characterized by moderately rugged topography, with elevation ranging from 280 to 380 m above sea level (asl). In general, the Canadian Shield physiography consists of rolling bedrock hills and local steep ledges and cliffs, separated by valleys filled with clay, glacial materials, swamps, streams, small kettle lakes and large bodies of water. Notable landmarks within the Property include Pine Grove Lake in the centre of the Property, Black River in the northwest corner and Jenny Creek running along Highway 614 in the top two thirds of the Property and along the abandoned Canadian Pacific Spur railway in the southern portion of the Property.

The Pine Grove Property is in the Ontario Shield Ecozone in Site District 3E4 of the Lake Abitibi Ecoregion. Land cover of this region is made up of a mixture of mixed forest (29.5%), coniferous forest (28.1%), sparse forest (108%) and deciduous forest (7.2%).



Figure 5.1 Pine Grove Property Access

Water comprises 6.7% of this ecoregion (Crins et al., 2009). The vegetation in the Property area is typical of the boreal forest and is dominated by black spruce, white spruce, balsam fir, jack pine, tamarack, balsam poplar and pine trees. The boreal forest supports a diversity of animal and bird species, examples include moose, gray wolf, lynx, snowshoe hare, red squirrel, beaver, common loon, spruce grouse and common raven.

### 5.3 Climate

In the Property area the climate is humid continental to subarctic, with long, cold and snowy winters lasting from October to April. The summer season is generally warm and rainy during the day and cool at night. Weather records from Manitouwadge, ON, recorded from 1971 to 2000, indicate average January maximum and minimum temperatures of -11.4°C and -22.8°C, respectively. Average July maximum and minimum temperatures are 23.9°C and 11.1°C, respectively. Average precipitation is 64.4 mm (January) and 107.4 mm (July) (Government of Canada, 2020).

### 5.4 Local Resources and Infrastructure

The town of Marathon, ON, has served as a support hub in the area for over a century; from the construction of the railway in the early 1880s, to forestry in the 1940s, to gold mining in the mid-1980s. Marathon hosts a population of 3,273, according to 2016 Canada Census data, and is served by the Canadian Pacific Railway and a public airport (Marathon Aerodrome). Services offered in Marathon include fuel, food, restaurants, hotels and a general hospital. Marathon lies approximately 56 km by road southwest of the Pine Grove Property.

The town of Manitouwadge, ON, hosts a population of 1,937 (according to the 2016 Canada Census data) and lies approximately 30 km by road north of the Pine Grove Property. Manitouwadge has supported mining in the area since the mid-1950s. Services offered by the town include fuel, food, restaurants, hotels and a general hospital.

There is an extensive history of exploration and mining in the Property area; mining and exploration staff are available from neighboring towns including Marathon, Manitouwadge, White River and the Biigtigong Nishnaabeg and Pic Mobert First Nations communities. Barrick Gold Corporation's Hemlo Mine is located approximately 13 km to the south-southwest of the Property and has been active year-round since the start of production in 1985. Mining and exploration significantly impact the economics of the region and are generally well received by the public.

# 6 History

This History Section includes discussion on exploration work that was conducted on, and in the general vicinity of, the current Pine Grove Property. The text and figures include spatial information and analytical results that occur both on-Property and off-Property (i.e., soil sampling conducted by Entourage Metals Ltd. in 2012 and a geophysical survey conducted on behalf of Tashota Resources Inc. in 2016). Drillhole 83 B-8, completed in 1983 by Homestake Mineral Development Company with Lenora Exploration Ltd. and Argentex Resource Exploration Corp., was drilled 20 m to the west of the current Property boundary. Due to its proximity to the Property and the Brinklow mineral occurrence, drillhole 83 B-8 has been included in the sub-text and associated tables and figures.

### 6.1 Introduction and Previous Ownership

Exploration in the Hemlo Mining District dates to 1869 with the discovery of gold showings by Moses Pee-Kong-Gay near the town of Heron Bay (Schneiders and Smyk, 1991), located approximately 30 km southwest of the Pine Grove Property. Since then, numerous exploration programs have been conducted in the Hemlo Mining District and in the area of the Pine Grove Property. Historically, the Pine Grove Property (or portions of the Property) has been labelled under many different names (e.g., Dillman, Gowan Lake, Hemlo, Lampson Lake-Pinegrove, Petrant Lake Northern Arm, Summers Lake etc.). Three mineral occurrences occur within the Pine Grove Property and include, from north to south, Jenny Creek Au-Zn, Turner Zn-Au-Ag and Brinklow Mo (Figure 6.1).

The author conducted a search of mineral assessment reports via the Ontario Ministry of Energy, Northern Development and Mines Assessment Files Database search tool (<u>http://www.geologyontario.mndm.gov.on.ca/index.html</u>) using the current Property claim boundaries as the search area. The results of the historical exploration work search included 56 assessment reports with claim areas falling within the Property, or a portion of the Property, and contain work programs conducted from 1965 to 2017. The results of the historical exploration work search are shown in Appendix 1.

The bulk of the exploration in the general area of the Pine Grove Property was completed by Carravelle Mines Ltd. (1965-1967), Noranda Exploration Company Ltd. and Noranda Minerals Inc. Geco Division (1983-1985, 1991-1992), Homestake Mineral Development Company (1983-1984), Key Lake Exploration Ltd. (1983), Chavin of Canada Ltd. (1983), Dolphin Explorations Ltd. (1987), Albert Turner (1991-1997), Hemlo Gold Mines (Exploration) Inc. (1994-1995), Entourage Metals Ltd. (2011-2012) and Tashota Resources Inc. (2016-2017). A brief summary of the exploration work conducted by previous owners at the Pine Grove Property is provided in the following sub-sections. A summary of the historical drilling conducted at the Pine Grove Property is presented in Table 6.1 and Figure 6.2.





#### Figure 6.1 Mineral occurrences in the Pine Grove Property area.



Figure 6.2 Historical drilling at the Pine Grove Property. The locations of Albert Turner's 1993 and 1994 drillholes are approximated. This figure includes drillhole 83 B-8, which is located 20 m to the west of the current Property boundary.



Company	Year	Drillhole series	Total drillholes	Dip (degrees)	Orientation (Azimuth)	l otal length (m)
Caravelle Mines Ltd.	1967	4-2-67	1	-45	45	140.85
Noranda Exploration Company Ltd	1983	PN5	1	-45	150	86.5
Homestake Mineral Dev. Co.	1983	83 B-8	1	-55	151	422.1
Noranda Minerals Inc. Geco Div.	1992	S-394 & S-395	2	-55 to -60	310	360.9
Albert C. Turner	1993-1995	T/93, T/94	4	-60 to -90	90 to 180	52.9
Albert C. Turner	1997	T/97	2	-45 to -90	0 to 90	7.6
		Total	11	_		1,070.9

# Table 6.1 Summary of historical drilling at the Pine Grove Property. The table includes drillhole 83 B-8, which is located 20 m to the west of the current Property boundary.

### 6.2 Historical Exploration Conducted by Previous Owners (1965 to 1998)

Early work in the Property area by Caravelle Mines Ltd. and Falconbridge Nickel Mines from 1965 to 1967 included airborne electromagnetic and magnetometer geophysical surveys, as well as a small diamond drill program. One diamond hole (4-2-67; Figure 6.2; Table 6.1) was drilled along the eastern edge of the current Property boundary. The report of work for the drill program (Caravelle Mines Ltd., 1969) contains the downhole lithology but does not include the assay results.

Noranda Exploration Company Ltd. (Noranda) conducted exploration on the Property from 1983 to 1985 in the southern portion of the current Pine Grove Property. Exploration by Noranda included geological mapping, geochemical soil sampling, geophysical surveying and a diamond drill program. The exploration was focussed on a sulphide bearing fragmental unit trending to the northeast along the contact of volcanic flows to the northwest and pyroclastics to the southwest (Bowdidge, 2016). The induced polarization (IP) and resistivity geophysical surveys outlined several strong IP anomalies in the area (Sutherland, 1983). No zones of interest were highlighted from the soil sampling programs, although isolated anomalous gold values of up to 430 parts per billion (ppb) Au were returned from the sample set (Gagnon, 1985; Bowdidge, 2016). One diamond hole (PN5; Figure 6.2; Table 6.1) was drilled within the current Property boundary, no gold values were returned from the drillhole (Bowdidge, 2016).

Homestake Mineral Development Company (Homestake), with Lenora Exploration Ltd. and Argentex Resource Exploration Corp., explored the Property from 1983 to 1984. Exploration included geological mapping, an IP geophysical survey, geochemical sampling and a diamond drill program with one drillhole (83 B-8; Figure 6.2; Table 6.1) completed at the Brinkley mineral occurrence, located 20 m west of the current Pine Grove Property boundary (Figure 6.1). The exploration focussed on a pyritic and sericitic rhyolite crystal lapilli ash tuff geological unit found in the southwest corner of the current Property boundary. The geochemical soil sampling highlighted anomalous molybdenum (Mo) values and a subsequent soil sampling program confirmed the anomaly (Staargaard, 1984a; 1984b). Results from drillhole 83 B-8 included 238 ppm Mo and 4.9 ppm Ag over 1.96 m in sheared pyrrhotitic felsic tuff to lapilli tuff (Muir, 2000).

In 1983, Key Lake Exploration Ltd. conducted electromagnetic very low frequency and magnetic geophysical surveys over the central portion of the current Pine Grove Property.

Chavin of Canada Ltd., New McManus Red Lake Gold Mines Ltd., and Corporate Oil and Gas Ltd. conducted exploration over a portion of the Property in 1983. Work consisted of airborne geophysics, prospecting, geological mapping, geochemical soil and rock sampling. Rock sampling near the Jenny Creek occurrence returned values of up to 180 ppb Au, 1,300 ppm Cu and >4,000 ppm Zn (Page, 1984). No further work was recorded, and the claims were cancelled in 1987.

In 1987, Dolphin Explorations Ltd. conducted a B-horizon soil sampling program over the Property. The program highlighted several isolated anomalous gold values, with some correlating to high values of mercury, copper and zinc (Sears, 1988).

Exploration by Noranda and Noranda Minerals Inc. Geco Division in 1991 and 1992 included geophysical surveying (magnetometer, very low-frequency electromagnetics (VLF-EM), horizontal loop method (HLEM) and deep EM), geological mapping, rock grab sampling and diamond drilling. The geophysical surveys highlighted a northeast striking conductive magnetic unit (Walmsley, 1991). Follow up work in 1992 identified this conductor as siliceous iron formation hosted by mafic volcanics (Charlton, 1992). Two diamond drillholes (S-394 and S-395) tested two separate geophysical targets in 1992 (Figure 6.2; Table 6.1). The drillholes intersected pyrite-pyrrhotite-magnetite bearing siliceous iron formations; no anomalous gold mineralization was reported (Lockwood, 1993).

From 1991 to 1997, Albert Turner of Manitouwadge conducted prospecting and rock sampling in the Property area and drilled six short diamond holes along Highway 614 (Figure 6.2; Table 6.1). Highlights from the rock grab samples collected in 1991 at the Turner occurrence (Figure 6.1) include 8.23 ppm Au, 0.41% Zn and 0.69% Zn in mafic volcanics (Turner, 1994). Rock samples collected by Turner in 1991 at the Jenny Creek occurrence (Figure 6.1) returned up to 0.51 ppm Au, 71 to 1,188 ppm Cu and 26 to 3,800 ppm Zn (McKay, 1996). Turner completed four separate drill programs in the Property area, with 3 holes drilled in 1993 (T1/93, T2/93 and T3/93), 1 hole (T6/94) and 1 drillhole extension of T1/93 (T1/94 extension) completed in 1994, 1 drillhole extension (DH T3/93) drilled in 1995 and 2 drillholes (T1-97 and T2-97) completed in 1997. Drillhole T3/93 intersected 0.29% Zn and 0.12% Cu over 1.22 m (Muir, 2000). The locations of the diamond holes drilled by Turner from 1993 to 1995 are shown on Figure 6.2 but are approximated.

Exploration on the Property by Hemlo Gold Mines (Exploration) Inc. (HGM) in 1994 and 1995 included geological mapping and sampling, geochemical soil sampling, trenching and magnetic and IP geophysical surveying. No significant gold values were returned from the geochemical sampling conducted by HGM. Nine IP anomalies were highlighted from the 1995 geophysical surveys on the Property (Lambert, 1995).

To the best of the author's knowledge, there are no records of exploration on the Property from 1998 to 2010.

### 6.3 Historical Exploration Conducted by Entourage Metals Ltd. (2011-2012)

Geological mapping and prospecting, a lithogeochemical rock sampling program and a B-horizon geochemical soil sampling program were completed by Entourage Metals Ltd. (Entourage) in 2011 and 2012. Entourage collected a total of 1,980 geochemical soil samples in the general Property area, 1,214 of which occur within the Pine Grove Property. Soil samples were collected at 40 m intervals on lines spaced approximately 200 m apart. The author reviewed a soil geochemical database that included the analytical results of all 1,980 samples. The analytical results (Au) of the soil sampling program are shown in Figure 6.3. Soil samples collected within the Property include 10 samples with > 50 ppb Au, 8 samples with >100 ppb Au and a maximum gold-in-soil assay of 1,800 ppb Au.

Entourage's QA-QC program for their sampling included the collection of duplicate samples at an average rate of 1 in every 35 samples. A bivariate plot illustrating the original soil sample assays for Au versus duplicate assays for Au is shown in Figure 6.4. The plot shows that there is an acceptable variance between the original and duplicate sample assays collected by Entourage in 2012, with the exception of one sample site (Figure 6.4). The sample site in question includes sample 12-1525 and duplicate sample 12-1526 assaying at 0.0005 ppm Au and 0.0350 ppm Au, respectively.

Entourage interpreted the analytical soil data using geostatistical methods. The soil grid showing threshold values of each pathfinder element and proportional symbols for each element are shown in Figure 6.5. The correlation chart of the pathfinder elements for the soil samples is shown in Table 6.2. Florek and Boucher (2012) indicate that the poor correlation in the chart in relation to the pathfinder elements in soils is possibly due to mobility differences of the elements in aqueous solutions. The reader is cautioned that the interpretation of the soil data by Entourage was completed using the entire soil sample dataset, including off-Property soil data and accordingly, this information may not necessarily be indicative of the mineralization on the Pine Grove Property that is subject of the Technical Report.

In addition to the soil program, 34 rock samples were collected by Entourage in the Property area in 2011 and 2012. The rock sample locations and gold geochemistry are presented in Figure 6.6. The maximum gold value returned from the rock samples collected within the Property by Entourage is 15 ppb Au.





June 23, 2021



Figure 6.4 Bivariate plot of original soil sample assays versus duplicate assays (Au)

Table 6.2. Correlation chart of pathfinder elements for soil samples from 2012 Entourage Metals Ltd. soil program. Source: Florek and Boucher (2012).

Correlation	Au_ppm	As_ppm	W_ppm	Mo_ppm	Pb_ppm	Sb_ppm	Ba_ppm	Bi_ppm	Cu_ppm
Au_ppm	1	-0.054	-0.12	-0.23	-0.069	-0.11	-0.098	-0.16	-0.11
As_ppm	-0.054	1	-0.054	-0.14	-0.03	0.056	-0.057	-0.12	-0.1
W_ppm	-0.12	-0.054	1	-0.18	-0.087	-0.13	-0.1	-0.1	-0.083
Mo_ppm	-0.23	-0.14	-0.18	1	0.26	-0.14	-0.17	0.57	-0.11
Pb_ppm	-0.069	-0.03	-0.087	0.26	1	-0.0012	-0.02	0.24	-0.04
Sb_ppm	-0.11	0.056	-0.13	-0.14	-0.0012	1	0.13	-0.11	-0.096
Ba_ppm	-0.098	-0.057	-0.1	-0.17	-0.02	0.13	1	-0.082	0.11
Bi_ppm	-0.16	-0.12	-0.1	0.57	0.24	-0.11	-0.082	1	-0.085
Cu_ppm	-0.11	-0.1	-0.083	-0.11	-0.04	-0.096	0.11	-0.085	1













### 6.4 Historical Exploration Conducted by Tashota Resources Inc. (2016-2017)

Exploration conducted on the Property by Tashota included an airborne Time Domain Electromagnetic and Magnetic (TDEM) and radiometric geophysical survey in 2016 and a geochemical rock sampling program in 2017.

### 6.4.1 2016 Magnetic and Time-Domain Electromagnetic Survey

A high-resolution heliborne magnetic and TDEM survey was conducted by PROSPECTAIR on behalf of Tashota in August of 2016. Airborne surveying was conducted along north-south oriented lines spaced 100 m apart. Images of the Residual Magnetic Intensity (RMI) and the RMI reduced-to-pole (RTP) vertical derivative (VD) with the PROSPECTAIR interpreted electromagnetic anomalies and possible structures are presented in Figures 6.7 and 6.8, respectively. The magnetic images show (as summarized from Dubé, 2016):

- Several strong magnetic anomalies throughout the block, with the strongest anomaly found along the eastern side of the survey area, likely relating to mafic/ultramafic or volcanic rocks.
- A quiet magnetic area in the southern corner, likely related to meta-sedimentary rocks.
- Narrow and elongated magnetic lineaments, likely related to mafic dykes, striking north-south, and stronger magnetic lineaments striking northeast-southwest or northwest-southwest.
- Isolated magnetic lineaments with no clear dominant orientation, likely related to local concentration of magnetite and pyrrhotite.
- Major faults crossing the blocks, indicated by an abrupt change in magnetic response.
- Seven intermediate (0.5 to 0.75 millisecond) EM anomalies.
- Of the seven TDEM anomalies highlighted by the survey, four prospective areas correspond to weak EM anomalies that are associated to strong and discrete magnetic anomalies and are located near inferred structural features.

The geophysical data was processed by Joël Dubé using Geosoft software Oasis Montaj version 8.5.5 and Matlab 7 R2009B. The data was levelled using intersection statistics from traverse and tie lines and decorrugation was applied to remove any remaining subtle non-geological features oriented in the direction of the traverse lines (Dubé, 2017).

Preliminary reprocessing of the geophysical data was completed and reviewed by the author to remove north-south oriented herringbone noise in the center of the survey area; additional processing is recommended to fully assess the data, including inverting the line TDEM data.

### 6.4.2 2017 Geochemical Rock Sampling Program

The geochemical rock sampling program conducted by Tashota in 2017 focussed on the TDEM anomaly areas outlined by the 2016 geophysical survey and on areas highlighted by Entourage's 2012 geochemical soil sampling program (see sub-section 6.2; Figure 6.3). A total of 83 rock samples were collected throughout the Property area with 72 samples sent for geochemical analysis. Results from the program include 5 samples with  $\geq$ 10 ppb Au and a maximum assay value of 57 ppb Au. The rock sample locations and gold geochemistry are presented in Figure 6.5.

The weakly anomalous samples taken in the south of the claim block correlate with a historical IP anomaly outlined by Noranda and are described as mafic to intermediate volcanic rock with magnetite (31 ppb Au) and medium grained mafic volcanic with abundant carbonate (57 ppb Au) (Bowdidge, 2017).






# Figure 6.8. 2016 Magnetic and TDEM Survey at the Pine Grove Property (RMI Reduced-to-Pole Vertical Derivative).

## 7 Geological Setting and Mineralization

The prospect-scale understanding of the geology and mineralization of the Pine Grove Property will evolve as Emperor commences modern exploration on the Property, however, the regional-scale geological setting is relatively well understood. The regional geological information in the following sub-section is largely derived from previous studies in the area by Kusky and Polat (1999); Magnus (2019); Muir (2000); Muir (2002); Percival (2007); Percival et al. (2012); and William et al. (1991).

#### 7.1 Regional Geology

Emperor's Pine Grove Property is situated in the eastern half of the Archean Schreiber-Hemlo greenstone belt within the Wawa-Abitibi Terrane of the central Superior Province of the Canadian Shield. The Wawa-Abitibi Terrane accreted to the Superior Province during the 2,690 Ma Shebandowanian Orogeny (Percival et al., 2012) and is a volcanic-plutonic belt consisting of 2.89 to 2.72 Ga rocks (Percival, 2007).

The Schreiber-Hemlo greenstone belt is comprised of Neoarchean supracrustal intrusive rocks and crosscutting and overlying Paleoproterozoic and Mesoproterozoic intrusive and supracrustal rocks of the Southern Province (Magnus, 2019). The Schreiber-Hemlo greenstone belt is described by Kusky and Polat (1999) as a typical Archean island arc terrane, evolving as a juvenile magmatic arc and forearc accretionary wedge above an Archean subduction zone. William et al. (1991) divide the Schreiber-Hemlo greenstone belt into three lithotectonic assemblages, with each assemblage composed of similar volcanic and siliciclastic rocks, including the Schreiber assemblage, the Hemlo-Black River assemblage and the Heron Bay-Playter Harbour assemblage.

The eastern portion of the Schreiber-Hemlo greenstone belt is the Hemlo section, known as the Hemlo greenstone belt. The Hemlo greenstone belt is a synclinorium, containing tholeiitic mafic volcanic rocks and metasedimentary supracrustal rocks, which are sandwiched between the Pukaskwa Gneissic Complex to the south and the Black-Pic Batholith/Gowan Lake Pluton to the north. The western side of the Hemlo greenstone belt is predominately composed of massive to pillowed tholeiitic basalt flows and felsic to intermediate calc-alkalic pyroclastic rocks with related sedimentary deposits and the eastern side of the belt consists predominately of turbiditic wacke to mudstone and minor conglomerate (Muir, 2002). The Hemlo greenstone belt is intruded by granodiorites of the Heron Bay Pluton and the Cedar Lake Pluton and phases of post-Archean diabase dykes. The rock units of the Hemlo greenstone belt have an easterly strike with steep to vertical dips (Muir, 2000; Muir 2002). The Hemlo greenstone belt differs from some of the other nearby greenstone belts in its small percentage of, or lack of, ultramafic rocks.

A discussion of the ages of the rock units within the Hemlo greenstone belt, in the Hemlo Gold deposit region, is as follows (from Muir, 2002):

• The minimum age of mafic volcanism is best constrained by crosscutting apophyses of the Dotted Lake pluton (ca. 2,697 Ma).

- Contact relationships with the Pukaskwa batholith (ca. 2,719 Ma) are unclear.
- Felsic calc-alkalic volcanism took place from ca. 2,698 to ca. 2,692 Ma, and intermediate volcanism from ca. 2,689 Ma.
- Sedimentation of turbiditic wacke–mudstone in the Hemlo Gold Deposit occurred after ca. 2,693 Ma for volcaniclastic deposits and possibly as late as ca. 2,685 Ma for wacke.
- The presence of felsic volcanic rocks dated at 2,695 ± 2 Ma (near Heron Bay) and 2,772 ± 2 Ma (at the Hemlo Gold Deposit) has been cited as evidence that a fault in the Hemlo Gold Deposit area, designated the Hemlo fault zone, represents a major structural discontinuity between terranes having different ages.

The supracrustal rocks in the Hemlo greenstone belt are multiply deformed with large scale folds and shear zones with two main structural stages recognized (Muir, 2002). There are several east-westerly trending shear/fault zones in the region, the major ones being the Lake Superior shear zone and the Hemlo fault zone, which may be joined. The main mineralization of the Hemlo Gold Deposit is associated with this fault system (Muir, 2000). Regional metamorphism ranges from lower greenschist facies in the western side of the greenstone belt to upper amphibolite facies in the eastern side of the greenstone belt (Kusky and Polat, 1999).

The regional geology of the Pine Grove Property area is shown in Figure 7.1.



#### Figure 7.1. Regional geology of the Pine Grove Property area.



#### 7.2 Property Geology

The following text on the geology and mineralization of the Pine Grove Property has been adapted or taken directly from historic mineral assessment reports or studies written on the Property area by Charlton (1992), Florek and Boucher (2012), McKay (1994), Milne (1968), Muir (2000), Richardson (1983) and Turner (1994). The bedrock geology of the Pine Grove Property is presented in Figure 7.2.

The Pine Grove Property is situated within the northern arm extension of the Hemlo greenstone belt. The Property is predominately comprised of northeast trending sequences of metavolcanic and metasedimentary lithologies, bound to the west and to the north by silicic plutonic rocks of the Black-Pic Batholith and the Gowan Lake Pluton. Six major rock units are identified within the Property and are described in the following sub-sections.

#### 7.2.1 Mafic to Intermediate Metavolcanics

Archean mafic to intermediate metavolcanics underlie the northern half of the Property and include: 1) medium to fine grained, massive and gneissic amphibolite; 2) medium to coarse grained, massive and gneissic amphibolite; 3) laminated hornblende gneiss; 4) pillow lava (amphibolite); 5) hematized, epidotized metavolcanic rocks; and 6) migmatite. The medium to fine grained amphibolite is dark green to dark grey or black in color and foliated with planar or fibrous orientation of hornblende grains. The pillow lava is generally fine to medium grained with stretching textures, parallel to the south in the direction of the foliation. The various types of amphibolite grade into each other, indicating that variations in texture and structure are related to variations in cooling rates, not to the existence of separate flows.

#### 7.2.2 Intermediate to Silicic Metavolcanics, Pyroclastic Rocks and Metasediments

Archean intermediate to silicic metavolcanics, pyroclastic rocks and metasediments occur within the bottom two thirds of the Property and include: 1) porphyritic dacite flows; 2) dacitic flow breccia; 3) pillow lava; 4) meta-rhyolite; 5) intermediate to silicic welded tuff or flow breccia; 6) agglomerate, tuff, greywacke; and 7) biotite gneiss. The intermediate mafic rocks are massive, fine to medium grained and strongly foliated. The porphyritic dacite flow is described as glassy with small quartz-feldspar phenocrysts and a prominent foliation. The porphyritic dacite flow breccia and intermediate metavolcanic rocks are interlayered with the mafic metavolcanics described in Sub-section 7.2.1. The agglomerate consists of stretched 2.5 to 12.5 cm pebbles in a mafic matrix. The tuffaceous rocks are generally white in color, fine grained, moderately sericitized and strongly laminated. The greywacke is described as fine grained, greenish white in color and strongly laminated.





Figure 7.2. Property geology of Emperor Metal Inc.'s Pine Grove Property.

#### 7.2.3 Metasediments

Archean metasediments occur in the southern part of the Property and include: 1) conglomerate and greywacke; 2) pyritic and muscovite quartz-feldspar gneiss; 3) biotitequartz feldspar paragneiss; 4) feldspathized or magmatic metasediments or tuff; and 5) garnet-biotite schist.

#### 7.2.4 Early Silicic Plutonic Rocks

The Archean early silicic plutonic rocks of the Black-Pic Batholith occur along the northern and western edges of the Property boundary. These rocks include hornblendebiotite granodiorite gneiss, biotite granodiorite gneiss, hematized granodiorite gneiss and undifferentiated plutonic rocks. The hornblende-biotite granodiorite gneiss is described as medium to coarse grained, equigranular, grey to light brown in color and massive with a slightly gneissic texture. The biotite granodiorite gneiss is grey to blueish grey in color, weathering light grey to white, and ranges from medium to coarse, to medium to fine-grained.

#### 7.2.5 Late Silicic Plutonic Rocks

Archean late silicic plutonic rocks on the Property include a small outcrop of hybrid diorite and granodiorite to the east of Jenny Creek Fault and biotite granodiorite dykes to the west of Jenny Creek Fault and to the north of Phil Lake Fault in the southern Property area. The biotite granodiorite dykes that intrude the metavolcanic, pyroclastic and metasedimentary formations and the Black-Pic Batholith are described as white, light grey or pink color, foliated or massive and biotitic with a mafic content of less than 10%. They are thought to be related to the late silicic plutonic intrusions in the area.

#### 7.2.6 Proterozoic Diabase Dykes

Several diabase dykes crosscut the rock units on the Property. The dykes tend to strike approximately north to northwest and are described as dark grey, medium grained, equigranular and massive, with a characteristic diabase texture. Diabase dykes in the Property area have measured from 18 to 76 m in width.

#### 7.2.7 Structural Geology

The metavolcanic, pyroclastic and metasedimentary rocks of the Property area have been highly metamorphosed and have undergone complex folding, as shown by the stretching of the pillows and agglomerate fragments and foliation in the rocks. Pillow top determinations indicate a south facing direction while the foliation is 90° to the pillows and the foliation trends north-northeast at 35°, dipping 80° to 85° to the southeast.

Three main faults occur within the Pine Grove Property, these include Pinegrove Lake Fault, Jenny Creek Fault and Phil Lake Fault. Pinegrove Lake Fault is one of the most extensive faults in the Property area, trending north 50° west, offsetting and continuing to

the east of Jenny Creek Fault. Jenny Creek Fault trends roughly north to south through the metavolcanics in the top two thirds of the Property area and curves to the southwest through metasediments in the southern Property area. Phil Lake Fault trends north 65° west in the southern Property area and appears to terminate against the Jenny Creek Fault in the east.

#### 7.3 Mineralization

A summary of the mineral occurrences in the Pine Grove Property area is presented in Figure 6.1. Three mineral occurrences occur within the Pine Grove Property and include, from north to south, Jenny Creek Au-Zn, Turner Zn-Au-Ag and Brinklow Mo occurrences.

The Jenny Creek occurrence comprises three separate occurrences, highlights from the occurrence area include:

- up to 0.43% Zn, 1.2 ppm Au, 32.91 ppm Ag and 291 ppm Cu in amphibolite containing narrow interflow banded iron formations and clastic sediments;
- up to 0.27% Zn and 180 ppb Au in a folded discontinuous iron formation with disseminated pyrite and pyrrhotite within banded magnetite units flanked by mafic flows at Jenny Creek North;
- 0.5% Zn in altered mafic flows at Jenny Creek South; and
- 33 ppb Au and >4,000 ppm Zn in altered mafic flow containing disseminated pyrite and pyrrhotite.

Photographs taken near the Jenny Creek occurrence provided from Mr. John Florek are presented in Figures 7.3 and 7.4.

The Turner occurrence area is located 500 m to the south of the Jenny Creek occurrence area. Highlights from the Turner mineral occurrence include:

- Up to 8.23 g/t Au along with 0.41 and 0.69% Zn from separate rock grab samples taken in mafic volcanics at the Turner occurrence in 1991;
- Up to 0.43% Zn, 32.99 ppm Ag and 1.12 ppm Au in garnetiferous mafic schist with 2 to 3% disseminated pyrite and pyrrhotite at Turner South;
- Up to 0.118 to 0.75% Zn in a garnetiferous amphibolite with 1 to 2% pyrite and pyrrhotite at Turner North; and
- Up to 0.29% Zn and 0.12% Cu over 1.22 m from drillhole T3/93 in a rusty mafic volcanic with up to 10% pyrite stringers.

The Brinklow occurrence is situated in the southwest corner of the Property and is classified as a discretionary occurrence. One drillhole was completed near the occurrence in 1983 (83 B-8) and returned 238 ppm Mo and 4.9 ppm Ag over 1.96 m in sheared pyrrhotitic felsic tuff to lapilli tuff with occasional sphalerite stringers. Drillhole 83 B-8 is located 20 m west of the current Property boundary, and was completed by Homestake Mineral Development Company with Lenora Exploration Ltd. and Argentex Resource Exploration Corp.



Figure 7.3 Jenny Creek occurrence banded iron formation. Source: John Florek.

Figure 7.4. Ankerite veining in banded iron formation at the Jenny Creek occurrence. Source: John Florek.





## 8 Deposit Types

Emperor is currently evaluating the Pine Grove Property for disseminatedreplacement-stockwork gold deposits, similar to Barrick Gold Corporation's Hemlo Gold Deposit, as well as intrusion related gold mineralization and structurally hosted shear zone type gold deposits. These deposit types are summarized in the sub-sections below.

#### 8.1 Hemlo Gold Deposit

The Hemlo gold deposit is described by Muir (2002) as an atypical, mesozonalorogenic, disseminated-replacement-stockwork deposit, broadly synchronous with  $D_2$ and "middle" stage granitoid plutonism, prior to or synchronous with peak regional metamorphism, and involving magmatic  $\pm$  metamorphic fluids (Cox et al., 2017).

The rocks hosting the Hemlo Gold Deposit are highly deformed Archean metasedimentary rocks, felsic igneous rocks, and to a lesser extent, heterolithic mafic fragmental rocks. Multiple horizons collectively form a thin (5 to 50 m wide) and tabular (~3 km long by >2 km deep) orebody, that dips steeply ( $60^{\circ}$  to  $70^{\circ}$ ) to the northeast. The wedge-shape thickens from east to west corresponding to a general decrease in the average grade. In longitudinal section, the deposit shows a moderate plunge to the west and a horseshoe shape near the surface. Surface exposure of the ore is minor. The two principal ore zones (Main and Lower) are neither stratabound nor stratiform (Muir, 2002). The ore is shear hosted and consists primarily of disseminated native gold in several mineralized zones near the contact between guartz-feldspar porphyry and metasedimentary rocks. Metasedimentary rocks (i.e., pelite, graywacke, arenite, marl, mafic fragmental rocks, and baritic sediment) host most of the ore. Ore types are potassium-feldspar-, muscovite- or barite-rich with 1-5% disseminated pyrite and up to 2% molybdenite (average ~0.16% at Golden Giant). The main high grade ore zone at Hemlo is often characterized by its blue color due to the presence of significant amounts of barite. It is unclear the exact nature of the barite as to whether it is originally sedimentary exhalative in origin and remobilized or hydrothermal coeval with the emplacement of gold.

The dominant alteration of the deposit is potassic and is characterized by a central zone of granoblastic microcline-quartz-(barite-muscovite-biotite-pyrite) rocks, surrounded by muscovite-quartz-pyrite schists. Unmineralized and unaltered metasedimentary host rocks are of lower amphibolite grade and contain the following assemblages: biotite garnet-staurolite-kyanite and/or sillimanite (metapelite) and amphibole-plagioclase (mafic fragmental rocks and marly sediment) (Heiligmann et al., 2008).

8.2 Intrusion Related Gold Deposits

Intrusion related gold deposits form a major class of ore deposits, are typically characterized by chalcophile metal association and may be porphyry or non-porphyry type (Thompson et al., 1999). Sillitoe indicates that major gold (or copper and gold) deposits of porphyry type are typically associated with highly oxidized, calc-alkaline to

alkaline, intermediate I-type intrusions (as cited in Thompson et al., 1999). Non-porphyry type intrusion related gold deposits are related to the same type of intrusions, although are associated with zinc, lead and silver. Non-porphyry types of mineralization styles related to intrusive rocks include breccia, skarn, replacement and vein types (Sillitoe and Thompson, 1998).

Intrusion related gold deposits form a distinct class from gold-rich porphyry deposits due to the following characteristics, as summarized by Eldursi et al. (2018): 1) their association with moderately oxidized to reduced small intrusions; 2) a metal association of tin, tungsten, molybdenum, bismuth, tellurium and arsenic; 3) low sulphide mineral content in veins; and 4)  $CO_2$  rich hydrothermal fluids. The mineralization is within the intrusion or the fractured thermal aureole and is thought to be genetically linked to the emplacement and cooling of the intrusions (Eldursi et al., 2018).

#### 8.3 Structurally Hosted Shear Zone Type Gold Deposits

Structurally hosted shear zone gold deposits occur extensively in Precambrian rocks with the main gold deposits in Canada found in the Archean greenstone belts of the Superior and Slave Provinces. These gold deposits are related to steeply dipping planar shear zones of brittle to ductile deformation. Regional faults are the result of brittle deformation within these zones of anomalously high strain. Shear zones are regional structures that are generally sub-parallel to the volcanic stratigraphy (Dubé and Gosselin, 2007). These shear zones can be up to several kilometres wide and may be well over 100 km long. They comprise zones of faulting and intense shearing that may be sub-parallel and relatively continuous or anastomosing, with enclosing islands of relatively unstrained rocks. These mesothermal vein systems are observed to occur in the central parts of discrete shear zones within the larger regional shear zones. Veins may also occur in dilation zones caused by folding. These veins are typically tabular, sub-vertical structures.

There is a general consensus that vein formation is related to metamorphic fluids from accretionary processes and generated by prograde metamorphism and thermal reequilibration of subducted volcano-sedimentary terranes. The deep-seated, Autransporting metamorphic fluid has been channeled to higher crustal levels through major crustal faults or deformation zones. Along its pathway, the fluid dissolves various components (e.g. gold) from the volcano-sedimentary packages, including a potential gold-rich precursor. The fluid then precipitates as vein material or wall-rock replacement in second and third order structures at higher crustal levels through fluid-pressure cycling processes and temperature, pH and other physio-chemical variations (Dubé and Gosselin, 2007; Robert et al., 2007). These gold systems are best developed in mafic lithologies at the contact between mafic lithologies and more felsic or sedimentary lithologies where reactivity of precursor mineral assemblages is high. Associated alteration commonly includes carbonate minerals (ankerite) and alkali metasomatism (albitization) (Robert et al., 1991).

## 9 Exploration

In 2021, Emperor commissioned a ground geophysical survey that was completed over the Pine Grove Property between April 6<sup>th</sup> and May 3<sup>rd</sup>, 2021. The objective of the survey was to obtain high-resolution magnetics data of the entire Pine Grove Property. The survey was completed using a high sampling rate paired with closely spaced survey lines to enable the detection of subtle magnetic anomalies and to characterize the magnetic fabric associated with different lithological units.

The magnetics (MAG) survey grid consisted of 120 survey lines orientated east-west over the Property, including: 69 traverse lines spaced 100 metres (m) apart; 32 infill lines over the central region offset at 50 m from the main grid and 19 infill lines also offset 50 m from the main grid along the south of the grid. The survey lines were nominally 1,825 m in the north, 2,600 m in the central region, 1,700 m in the south. The survey totalled 196.34 line-km.

Processed magnetics data is presented in Figure 9.1. Interpretation of the magnetics survey data is currently underway.

Survey method	Survey days	Grid lines	Line spacing (m)	Line lengths (m)	Total stations	Station spacing (m)	Total line-km
MAG	28	120	50-100	1,700- 2,600	424,760	0.76	196.34

 Table 4.1 Ground Geophysical Grid Summary Statistics.

# 10 Drilling

Emperor has yet to conduct any drilling at the Pine Grove Property. A summary of the historical diamond drill programs completed by companies other than Emperor is presented in Section 6. None of this work was conducted by or on behalf of Emperor.

# 11 Sample Preparation, Analyses and Security

Emperor has completed a ground magnetic survey as a portion of the Stage 1a recommended program, but is yet to conduct surface sampling or drilling at the Pine Grove Property. The bulk of the exploration within the Pine Grove Property was completed by Carravelle Mines Ltd. (1965-1967), Noranda Exploration Company Ltd. and Noranda Minerals Inc. Geco Division (1983-1985, 1991-1992), Homestake Mineral Development Company (1983-1984), Key Lake Exploration Ltd. (1983), Chavin of Canada Ltd. (1983), Dolphin Explorations Ltd. (1987), Albert Turner (1991-1997), Hemlo Gold Mines (Exploration) Inc. (1994-1995), Entourage Metals Ltd. (2011-2012) and Tashota Resources Inc. (2016-2017).





The information regarding the sample collection, analyses and security of the historical work programs at Pine Grove has been compiled by the author from mineral assessment reports dated between 1965 and 2017 (see Section 6 and Appendix 1). Not surprisingly, some of the mineral assessment reports lack exploration detail and rigor, therefore, not all historical programs are discussed in the following sub-section.

#### 11.1 Sample Collection, Preparation, Security and Analysis

#### 11.1.1 Historical Surface Sampling

Several companies have collected rock, soil or trench (channel) samples in the Property area since the 1980s. Information on the sample collection, preparation, security and analysis of select historical programs is summarized in the following points:

- Homestake Mineral Development Company (1983): Soil samples were collected at 25 m intervals on lines spaced 50 m apart. Samples were collected from the B-horizon using mattocks with samples placed into kraft paper bags. The samples were shipped to Acme Analytical Laboratories Ltd. (Acme) in Vancouver, BC, for analysis. Sample preparation at Acme include drying each sample at 60°C and screening to -80 mesh followed by an acid digestion and analysis for 30 elements using Inductively Coupled Plasma (ICP). Samples were analyzed for gold by fire assay with an Atomic Absorption (AA) spectroscopy finish (Staargaard, 1984).
- Noranda Exploration Company Ltd. (1985): Soil samples were collected at intervals of 12.5 m and 25 m from the B-horizon using a grub hoe. The average depth of sample collection was 15 cm. The samples were dried in the field then sent to T.S.L. Laboratories in Mississauga, ON for analysis. Sample preparation at T.S.L. Laboratories included drying and screening to -80 mesh. Samples were analyzed for gold by fire assay with an AA finish (FA-AA) (Gagnon, 1985).
- Dolphin Explorations Ltd. (1987): Soil samples were collected from the B-horizon at intervals of 25 m along lines spaced 100 to 200 m apart using a grub hoe. The depth of sample collection varied from 7 to 38 cm. Samples were collected into kraft sample bags, partially dried and sent to Bondar Clegg and Co. Laboratory in Ottawa, ON, for preparation and analysis. Sample preparation at the laboratory included drying and screening to -80 mesh. Samples were analyzed for gold via aqua regia extraction and fire assay with an AA finish. Mercury was analyzed using extraction via HNO<sub>3</sub>-H<sub>2</sub>SO<sub>4</sub>-HCl-KMnO<sub>4</sub> and Cold Vapor AA. Six other elements (Ag, As, Mo, Cu, Zn and antimony (Sb)) were analyzed by a DC Plasma method after extraction by HCl-HNO<sub>3</sub> (Sears, 1988).
- Hemlo Gold Mines (1994):

- Trenching was completed using a track mounted Caterpillar 219 excavator and performed by Methot Excavating. After excavation of the trenches was completed, the stripped areas were washed prior to sample collection. Select samples were sent to Accurassay Laboratories in Thunder Bay, ON, for gold analysis. The method of analysis is not documented in Londry (1995a). Additionally, select samples were sent to Chemex Labs Ltd. in Vancouver, BC. Gold was analyzed at Chemex Labs Ltd. by fire assay with an AA finish. Samples were also analyzed for twelve oxide compounds and barium (Ba), rubidium (Rb), strontium (Sr), niobium (Nb), zirconium (Zr) and yttrium (Y). The method of analysis is not documented on the Chemex Labs Ltd. Certificate of Analysis (Londry, 1995a).
- Soil samples were collected from the B-horizon at intervals of 25 m using a grub hoe. The depth of sample collection varied from 10 to 25 cm. Samples were sent to Norex Laboratory in Bathurst, New Brunswick, for preparation and analysis. Sample preparation included drying and screening to -80 mesh. Samples were analyzed for gold using aquaregia digestion followed by AA (Londry, 1995b).
- Entourage Metals Ltd. (2011-2012): Soil samples were collected at 40 m intervals on lines spaced approximately 200 m apart using a soil auger targeting the B-horizon. The date of sample collection, soil sample ID, coordinates, soil sample description and any additional comments were recorded into a field notebook. Duplicate soil samples were collected during the sampling program at a rate of approximately 1 duplicate every 35 samples. The soil and rock samples were analyzed by AGAT Laboratories in Mississauga, Ontario. The soil samples were dried and screened to -80 mesh followed by aqua regia digestion analysis and Inductively Coupled Plasma/Inductively Coupled Plasma Mass spectrometry (ICP/ICP-MS) finish. Gold was determined with a 30 g fire assay with Inductively Coupled Plasma Optical Emission spectroscopy (ICP-OES) finish. The rock samples were analyzed for gold using an ultra-trace level geochemical procedure and an Atomic Absorption spectroscopy (AAS) finish with four-acid digestion, followed by ICP-MS and Inductively Coupled Plasma Atomic Emission spectroscopy (ICP-AES) (Florek and Boucher, 2012). AGAT Laboratories complies with the data quality objects of the International Standards Organization (ISO/IEC 17025:2017 and ISO 9001:2015).
- Tashota Resources Inc. (2017): The rock samples were sent to ALS Canada Ltd. in Thunder Bay, ON, for preparation and to ALS Canada Ltd. in North Vancouver, BC, for analysis. At the ALS preparation facility, the samples were logged into a computer-based tracking system, weighed and dried. The entire sample was crushed so that +70% passed a 6 mm screen, then finely crushed so that +70% passed a 2 mm screen. A split was then selected and pulverized to better than 85% passing a 75-micron screen. From Thunder Bay the samples

were shipped to Vancouver for geochemical analysis. A 30 g aliquot was extracted from the pulp and analyzed for gold using fire assay fusion and ICP-AES. ALS Canada Ltd. Laboratories complies with the data quality objects of the International Standards Organization (ISO/IEC 17025:2017).

#### 11.1.2 Historical Drilling

Ten diamond drillholes, totalling 648.8 m, were completed within the Pine Grove Property by four separate companies from 1967 to 1997. There is little documentation detailing the sample preparation and security of historical drill samples in the Pine Grove Property. Limited analytical information on the drill programs has been derived from mineral assessment reports and is summarized in the following points:

- 1967: The diamond drilling report by Caravelle Mines Ltd. (1969) does not include documentation on the analyses or analytical method for drillhole PN5 completed on the Property.
- 1983: The diamond drilling report by Noranda Exploration Co. Ltd. (1983) does not include documentation on the analyses or analytical method for drillhole 4-2-67 completed on the Property.
- 1992: The diamond drill report by Lockwood (1993) mentions that the samples were sent to Geco Mine Laboratory but does not include documentation on the analyses or analytical method for the two Noranda drillholes (S-394 and S-395) completed on the Property.
- 1993-1997: The diamond drill reports by Turner (1994; 1995; 1997) indicate that the core samples from the drillholes completed in 1993 and 1994 were assayed by Noranda Mines Geco Div. in Manitouwadge, ON. Samples from drillhole extension T3/93 drilled in 1995 were sent to Accurassay Laboratories in Thunder Bay, ON for analysis. The two drillholes completed by Turner in 1997 were assayed by Geoscience Laboratories with method code CFA. The Turner (1994; 1995) reports do not include documentation on the analyses or analytical method. Method code CFA is mentioned in Turner (1997).

#### 11.2 Quality Assurance – Quality Control

The Issuer, Emperor, has recently completed a ground magnetic survey but is yet to complete any surface sampling or drilling exploration work at the Pine Grove Property.

Historical quality assurance – quality control (QA-QC) work via mineral assessment reports was either not done, or the QA-QC results were not fully detailed within the various reports. Archived reports on the historical drilling programs do not specifically address QA-QC issues. The 2011-2012 soil sampling data provided by Emperor included the collection of duplication samples at a rate of approximately 1 duplicate in every 35 samples collected.

With respect to any future programs conducted by Emperor, the author recommends that the Company develop a comprehensive QA-QC program as part of any future exploration work. The Company should ensure that the QA-QC protocols align with CIM Definition Standards and Best Practice Guidelines for mineral resources and reserves to provide adequate confidence in the data collection and processing.

#### 11.3 Adequacy of Sample Collection, Preparation, Security and Analytical Procedures

The author has reviewed the adequacy of the historical exploration information as conducted by companies other than Emperor and the visual, physical, and geological characteristics of the Property. The Qualified Person has found no significant issues or inconsistencies that would cause one to question the validity of the data for its specific use as 'background information' during the preparation of this geological introduction Technical Report.

In the future, however, the author recommends that the sample collection, preparation, security, analytical procedures and QA-QC procedures of any Emperor-led exploration program is current with CIM standards and guidelines and robust enough to develop confidence for any future mineral resource/reserve modelling and estimations.

## 12 Data Verification

#### 12.1 Author's Site Visit

Mr. Flank conducted a site visit to the Pine Grove Property on May 1<sup>st</sup>, 2021. Mr. Flank was accompanied by Mr. Robert Ferner of APEX Geoscience Ltd. who helped navigate the Property to suspected locations of historical mineral showings. The author completed traverses on the Property to locate the historical Turner and Jenny Creek showings. The author also traversed along an overgrown trail and located a historical trench completed by Hemlo Gold Mines in 1995. Coordinate translation issues were noted from the Ministry of Northern Development and Mines locations for the Turner and Jenny Creek showings but mineralized outcrops matching the description of those showings were located with the aid of hand drawn maps extracted from historical assessment reports.

A total of 10 samples were collected from the Turner, Jenny Creek and Hemlo Trench areas. Additionally, a single sample was taken from quartz veins within altered granites near the intersection of interpreted north and northwest trending structures, inferred from regional magnetic data. In total, 11 samples were collected from the Property during the field visit. Sample locations and the inferred locations of the historical showings are shown in Figure 12.1 and Table 12.1. Sample results are shown in Table 12.2.

The samples were collected, bagged, sealed and dropped off at ALS Canada Ltd. (ALS) in Thunder Bay, ON, by the author. ALS is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 and is independent of Emperor and the author of this Technical Report. Rock sample preparation at ALS in Thunder Bay commenced with sample sorting, cataloguing, and drying followed by crushing to better than 70% passing a 2 mm sieve. A homogenized, 250-gram split from the -2mm portion of the sample was then pulverized to 85%, or better, passing through a 75-micron sieve. The prepared samples were sent to ALS in North Vancouver for analysis. The samples were analyzed for gold by a 30g fire assay with an ICP (AES) finish and for 33 element geochemistry by four acid digestion followed by Inductively Coupled Plasma (ICP) atomic emission spectroscopy (AES). Over limit analysis for Zn was completed using four acid digestion. The specific ALS laboratory codes included: Au-ICP21 (Au 30 g FA ICP-AES), ME-1CP61 (ICP-AES) and Zn-OG62.

The rocks at the Turner location are comprised of strongly foliated silicified and locally sulfidized mafic volcanic tuff, containing up to 10% pyrite (Figure 12.2). Foliations from these units trend between 32 and 37 degrees and dip to the east at approximately 75 degrees. Five samples were taken from the Turner location (PG-SF-001, PG-SF-002, PG-SF-003, PG-SF-004, PG-SF-005) with the highest Au values of 0.017 ppm returned from PG-SF-002. This sample also returned 1.195% Zn and 640 ppm Cu. A sample from station PG-SF-003 on the same outcrop returned 1,180 ppm Cu and 2,240 ppm Zn with 0.011 ppm Au.





Station ID	Northing (NAD 83 16U)	Easting (NAD 83 16U)	Elevatio n (m)	Date	Sample ID	Rock Type	Mineralization	Structur e Type	Structure Az	Structure Dip	Description
PG-SF-001	5411013	583326	329	5/1/2021	E190115	Mafic Tuff	Trace Pyrite	Vein	101	-36	Strongly foliated, tuffaceous mafic volcanic. Sample taken from 10cm wide quartz vein and adjacent wall rock with trace pyrite. Weakly silicified.
PG-SF-002	5411037	583328	318	5/1/2021	E190116	Mafic Tuff	2% Pyrite				Strongly foliated and Fe stained mafic volcanic. 1- 2% py along foliation planes.
PG-SF-003	5411038	583326	310	5/1/2021	E190117	Mafic Tuff	5% Pyrite	Foliation	32	-75	Strongly foliated, silicified and sulfidic Mafic- Intermediate volcanic tuff. Sampled 5m from contact with pink-red granite.
PG-SF-004	5411058	583324	310	5/1/2021	E190118	Gossan	10% Pyrite	Foliation	37	-75	Gossanous zone within massive mafic volcanics. Very rusted, weathered. Possible shear zone within competent volcanics.
PG-SF-005	5411065	583328	314	5/1/2021	E190119	Massive Mafic Volcanic	3% Pyrite	Vein	37	-75	Sampled qtz vein near gossan in PG-SF-004.
PG-SF-006	5410495	583623	356	5/1/2021	E190120	Granite		Vein	320		Red pink granite with a series of three 1-5cm qtz veins trending 320 with variable dips. Moderate epidote alteration proximal to veins. Sampled vein and rusty margins.
PG-SF-007	5412543	583457	, 339	5/1/2021	E190121	Felsic Tuff	2% Pyrite, Trace Sphalerite				Likely the true location of the Jenny Creek MDI showing. Gossan within interbedded felsic tuff and iron formation. Also in contact with garnet bearing amphibolite. Sampled quartz vein with pyrite and sphalerite along mareins.
PG-SF-008	5412543	583457	339	5/1/2021	E190122	Felsic Tuff	Tr. Pyrite	Foliation	345	-80	Rusty felsic tuff from same
PG-SF-009	5412550	583461	. 338	5/1/2021	E190123	Mafic Tuff	Tr. Pyrite				Strongly foliated and sheared mafic tuff (or shear zone). Zone is folded into a Z-shape. Trace py and possibly biotite.
PG-SF-010	5412560	583570	341	5/1/2021	E190124	Massive Mafic Volcanic	Tr. Pyrite				Waypoint location of MDI for Jenny creek location. Located a number of low lying outcrops of weekly mineralized mafic volcanics.
PG-SF-011	5407456	581808	353	5/1/2021	E190125	Biotite- Feldspar Schist		Foliation	210	-85	Shear zone at Hemlo Trench. Strong epidote alteration and weak K alteration along shear zone with boudinaged quartz

## Table 12.1. Sample location and descriptions from the Pine Grove Property site visit.

veins. Sampled quartz and altered shear zone.

Station ID	Northing	Easting	Elevation	Date	Sample	Au (ppm)	Ag (ppm)	Cu (ppm)	Zn (ppm)	Zn (%)
	(NAD83 16U)	(NAD83 16U)	(m)		ID					
PG-SF-001	5411013	583326	329	5/1/2021	E190115	0.001	<0.5	54	88	
PG-SF-002	5411037	583328	318	5/1/2021	E190116	0.017	1.7	620	>10000	1.195
PG-SF-003	5411038	583326	310	5/1/2021	E190117	0.011	1.5	1180	2240	
PG-SF-004	5411058	583324	310	5/1/2021	E190118	0.009	<0.5	126	383	
PG-SF-005	5411065	583328	314	5/1/2021	E190119	0.005	<0.5	75	248	
PG-SF-006	5410495	583623	356	5/1/2021	E190120	0.001	<0.5	1	25	
PG-SF-007	5412543	583457	339	5/1/2021	E190121	0.005	<0.5	181	871	
PG-SF-008	5412543	583457	339	5/1/2021	E190122	0.003	<0.5	115	485	
PG-SF-009	5412550	583461	338	5/1/2021	E190123	0.011	<0.5	260	1125	
PG-SF-010	5412560	583570	341	5/1/2021	E190124	0.003	<0.5	44	130	
PG-SF-011	5407456	581808	353	5/1/2021	E190125	<0.001	<0.5	38	75	

Table 12.2. A	Assay results	from grab	samples	collected	during	Property v	/isit.
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A single sample was taken from a quartz vein hosted within granite; 600 m southeast of the Turner location at station PG-SF-006. No significant results were returned from this sample.

The Jenny Creek occurrence was located and sampled proximal to its recorded location in the Mineral Deposit Inventory of the MNDM. A folded banded iron formation is in sharp contact with a medium grained amphibolite, and tuffaceous beds within the iron formation are rusty, containing up to 2% pyrite and trace sphalerite (Figure 12.3). Five samples from stations PG-SF-007, PG-SF-008, PG-SF-009 and PG-SF-010 were collected from outcrops proximal to the occurrence location, with PG-SF-007 returning the best results of 1,125 ppm Zn and 0.011 ppm Au.

An overgrown trench, approximately 200 m long by 2 to 4 m wide was located and investigated (Figure 12.4.). Felsic volcaniclastic rocks in the southern portion of the trench were separated from granodiorite to the north along a shear zone with hematite and epidote alteration. The author collected a sample from station PG-SF-011, located within the shear zone. No significant results were returned from this sample.

The author sought to verify the Turner and Jenny Lake occurrences by collecting a suite of samples from both locations. The grab samples collected by the author were selective in nature and intended to identify any potential anomalous gold mineralization in the presumed vicinity of the historical mineral showings. The author's sampling confirmed zinc and copper mineralization at the Turner occurrence, zinc mineralization at the Jenny Creek occurrence and weakly anomalous gold mineralization at the Turner and Jenny Creek occurrences. The weakly anomalous gold mineralization does not confirm the historical gold results of these mineral occurrences; however, the author recommends additional sampling and prospecting to fully assess the mineralization potential of these prospects.

The Property is at an early-stage of exploration. During the site visit the author was able to examine geology, mineralized outcrops on the Property and historical trenches

consistent with historical documentation of mineral occurrences. In consideration of this and the available historical data the author can conclude that the Property is an early-stage exploration "Property of Merit".

Figure 12.2. Strongly foliated and Fe-stained mafic volcanic tuff near the Turner showing: PG-SF-002.



Figure 12.3. Jenny Creek occurrence. Folded banded iron formation flanked by amphibolite. PG-SF-007 and PG-SF-008.





Figure 12.4. Historical trench excavated by Hemlo Gold Mines in 1995.

#### 12.2 Data Verification Procedures

The sample locations and assay information for the Entourage soil sampling program conducted at the Property in 2012 were provided to the author as a digital excel file. The author reviewed the digital data provided by Entourage and compared it against original assay certificates. No errors or issues were identified in the Entourage exploration data. The 2016 Tashota Resources Inc. heliborne magnetic and TDEM survey data was provided to the author in the form of a Geosoft database, with map exports provided in PDF, PNG, Geotiff and Geosoft MAP formats. The geophysics data was reviewed and deemed to be complete and suitable for use in reprocessing and interpretation. All other information regarding historical exploration on the Property was obtained from mineral assessment reports.

The author cross-referenced information on historical drilling programs on the Property (Caravelle Mines Ltd., 1969; Lockwood, 1993; Staargaard, 1984a; Staargaard, 1984b; Turner, 1994a; Turner, 1994b; Turner, 1997) with the Ontario Ministry of Energy, Northern Development and Mines Drill Hole Database (ODHD). The author used original hardcopy drillhole logs and assay logs to verify the drillhole information in the ODHD. The original drill collar information in mineral assessment reports was provided as grid coordinates (i.e., not in UTM or Lat/Long coordinates) or shown on hand-drawn maps. The general location of the drillholes were generally supported through reviews of the original drill log transcripts and associated drill maps, with the exception of the drillholes completed by Turner (1993-1997). It is noted in the ODHD that collar locations of T2/93 and T3/93 are approximated, centred on historical claim 1147983. An alternate set of coordinates for T3/93 was found while reviewing the Turner mineral occurrence in the Ontario government Mineral Deposit Inventory Database (MDI). No other issues were noted.

The author cross-referenced and verified information regarding the known mineral occurrences (Jenny Creek, Turner and Brinklow) within the Property obtained from the Ontario government MDI, with original assays from historical mineral assessment reports and Geological Compilation Map 2614 (Muir, 2000). No issues were noted.

#### 12.3 Adequacy of the Data

This is a geological introduction Technical Report prepared for a Company that has just acquired the Property. The QP has reviewed the adequacy of the exploration information and the visual, physical and geological characteristics of the Property and has found no significant issues or inconsistencies that would cause one to question the validity of the data.

The author is satisfied, and takes responsibility, to include the exploration data including geochemical surveys and drill information as background information for this geological introduction and qualifying Technical Report. In the future, however, the author recommends that the sample collection, preparation, security, analytical procedures and QA-QC procedures of any Pine Grove exploration program is current with CIM definition

standards and guidelines and robust enough to develop confidence for any future mineral resource/reserve modelling and estimations.

## 13 Mineral Processing and Metallurgical Testing

Emperor has yet to conduct mineral processing and/or metallurgical testing at the Pine Grove Property.

## 14 Mineral Resource Estimates

Emperor has yet to conduct mineral resource/reserve modelling or estimations. There are no known mineral resources or reserves outlined at the Pine Grove Property.

Sections 15-22 are not required. The Pine Grove Property is an early-stage exploration project.

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## 23 Adjacent Properties

The Pine Grove Property is surrounded by claims owned by several companies including Barrick Gold, Hemlo Explorers, Panther Metals, North American Exploration, Goldseek Resources as well as individual prospectors or groups of prospectors (Figure 23.1).

The major claims holder in the immediate vicinity of the Pine Grove Property is Hemlo Explorers. Hemlo Explorers' North Limb property surrounds the Pine Grove Property on all sides. In 2016, Canadian Orebodies (now Hemlo Explorers) consolidated the historically fragmented ground in this area into a larger land package known as the North Limb Property, covering over 6,300 hectares. The North Limb property covers the northern extent of the Heron Bay-Hemlo greenstone belt. Only early-stage exploration has been completed across the Property. Historical exploration indicates that the property contains similar porphyritic, volcanic and sedimentary host rocks and exotic mineralization, similar to the unique Hemlo assemblage. Exploration targets for the property include Hemlo-type lode gold mineralization, within 'greenstone' mafic volcanics and metasediments, iron formation gold and volcanogenic massive sulphide mineralization. Previous exploration has encountered extensive alteration potentially indicative of, or related to, gold and VMS-style mineralization, as well as local indications of potential copper-nickel-PGE mineralization (Pettigrew and Weston, 2016).

The currently producing Hemlo Mines are located approximately 13 km south of the Pine Grove Property. In 2016, Barrick Gold Corporation (Barrick) completed an extensive exploration campaign on the Hemlo Mines property which indicated significant exploration potential exists on the property (Cox et al., 2017). The Hemlo Mine property is located along the south-central part of the Hemlo Greenstone Belt in Northwestern Ontario, Canada and consists of the Williams Mine, David Bell Mine, and the Golden Giant Mine, with the Williams Mine being the only currently active mine of the three. Mineralization in the Hemlo gold deposit is interpreted to be an atypical, mesozonal-orogenic, disseminated-replacement-stockwork deposit (Muir, 2002).

Mineralization is hosted within quartz veins, in the groundmass along the contact of overlying metasedimentary rocks and underlying felsic volcanic rocks, and on limbs of tight isoclinal folds (Muir, 2002; Cox et al., 2017). The mineralization is structurally controlled on a variety of scales (Muir 2002). Magmatic and mineralizing fluids for the deposit likely originated from deep-seated metamorphism with mineralization occurring between 2,689 and 2,684 Ma (Muir, 2002). Gold content is visually indicated by the presence of barite, molybdenite and vanadium-rich mica. The Hemlo gold deposit is approximately three km long and has an average width of 20 m with a very small surface expression. The ore body has a maximum horizontal thickness of 45 m near the Golden Giant boundary and generally declines in width and grade, moving west from the property boundary. At the Williams Mine site, the Hemlo deposit extends from the surface to a depth of at least 1,300 m, however, the vast majority of the mineralization discovered and mined to date occurred and occurs below a vertical depth of over 500 m.







Historically, exploration drilling has been conducted on the Hemlo Mine property by several companies. Approximately 10,845 diamond drill holes have been completed on the property between 1947 and 2016. Mines on the property have been in production since 1985 and have produced over 21 million ounces of gold as of December 2016 (Barrick Gold Corp., 2020). The author has not visited the Hemlo mine and has not verified the following information on resources and reserves. The presence of mineralization with resources and reserves at Hemlo is not necessarily indicative of potential mineralization or resources or reserves that may or may not exist on the Pine Grove Property.

Gold has been extracted from a combination of open pit and underground mining at Williams Mine, David Bell Mine and Golden Giant Mine. The latter two mines ceased production in 2014 and are currently undergoing reclamation. The Williams Mine operation is projected to have enough underground mineral reserves to continue production through to 2021 at an average production ate of 3,600 tonnes per day (tpd). Mineral processing and recovery methods at these facilities consist of grinding, cyanide leaching, carbon-in-pulp (CIP), carbon stripping and reactivation, electrowinning, and refining (Cox et al., 2017).

As of 2016 the reported Hemlo Mine Mineral Reserve estimate is 25.7 million tonnes at 1.92 g/t Au, containing 1.6 million ounces of gold. Measured and Indicated Mineral Resources include 58.9 million tonnes of material averaging 0.91 g/t Au, containing 1.72 million ounces of gold. Inferred Mineral Resources total 7.8 million tonnes at 1.94 g/t Au, containing 0.48 million ounces of gold (Cox et al., 2017). The author does not imply any size or grade relationship between the Hemlo Mines Reserves and Resource, and the Pine Grove Property and notes that this information is not necessarily indicative of the mineralization known or to be expected on the Pine Grove Property, which is the subject of this Technical Report.

## 24 Other Relevant Data and Information

Emperor has only recently procured the right to acquire the Pine Grove Property. The author is not aware of any other relevant data and information to report at this time.

# 25 Interpretation and Conclusions

The Pine Grove Property is located approximately 40 km east-northeast of Marathon, ON, and comprises 85 cell claims encompassing an area of approximately 1,317 hectares (3,254 acres). The Property is situated within the Archean Schreiber-Hemlo greenstone belt in the Wawa-Abitibi Terrane of the central Superior Province of the Canadian Shield and lies 13 km north-northeast of the Hemlo Gold Deposit, a world-class Archean disseminated-replacement-stockwork gold deposit that has produced in excess of 21 million ounces of gold (Barrick Gold Corp., 2020).

This Technical Report on the Pine Grove Property has been prepared by Mr. Steven Flank of Bayside Geoscience Inc., Thunder Bay, Ontario, Canada to provide a geological introduction to the Pine Grove Property, to summarize historical work conducted on the Property from 1965 to 2017 and to provide recommendations for future exploration programs. This report has been prepared in accordance with National Instrument 43-101, Companion Policy NI 43-101CP and Form 43-101F. The effective date of this Technical Report is May 1<sup>st</sup>, 2021.

The Pine Grove Property lies in a favourable geological setting, in proximity to the world-class Hemlo Gold Deposit, in an area supported by a skilled labour force with over 30-years of mining experience. Historical exploration on the Pine Grove Property has identified several areas of anomalous mineralization associated with geophysical anomalies. Key highlights include:

- Entourage's 2012 B-horizon soil sampling program highlighted an anomalous area (up to 1,800 ppb Au) near the contact of Archean metasedimentary and silicic plutonic rocks in the southwestern part of the Property. Three anomalous samples (>100 ppb Au) were collected over mafic to intermediate metavolcanics in the northern part of the Property and correlate to geophysical anomalies outlined in Tashota's 2016 high-resolution heliborne magnetic TDEM survey. Furthermore, two anomalous samples (>100 ppb Au) were collected along the Jenny Creek Fault, near the interpreted intersection with the Pinegrove Lake Fault. The clustered and trending patterns of the anomalous soil samples suggest underlying bedrock and/or structural control of the mineralization.
- Historical geophysical surveys over the Property have identified several IP and TDEM anomalies within the Property, with four of the TDEM anomalies highlighted by Tashota's 2016 survey corresponding to weak electromagnetic anomalies spatially associated with strong and discrete magnetic anomalies near interpreted structural zones. The majority of the anomalies remain untested by historical work.
- Gold mineralization of up to 8.23 g/t Au in mafic volcanic rocks collected near the Turner occurrence, in proximity to the structural intersection of the Jenny Creek and Pinegrove faults.
- Results of up to 0.43% Zn, 1.2 ppm Au, 32.91 ppm Ag and 291 ppm Cu in banded iron formation at the Jenny Creek occurrence.

Emperor conducted a ground magnetic survey that was completed over the Pine Grove Property between April 6<sup>th</sup> and May 3<sup>rd</sup>, 2021. The survey totalled 196.34 line-km and provided high-resolution magnetics data over the entire Pine Grove Property. Interpretation of the survey data is currently underway as the Company awaits the planned IP survey.

Mr. Flank conducted a site visit to the Pine Grove Property on May 1<sup>st</sup>, 2021. The author's sampling confirmed zinc and copper mineralization at the Turner occurrence, zinc mineralization at the Jenny Creek occurrence and weakly anomalous gold mineralization at the Turner and Jenny Creek occurrences. The weakly anomalous gold mineralization does not confirm the historical gold results of these mineral occurrences; however, the author recommends additional sampling and prospecting to fully assess the mineralization potential of these prospects.

Based upon the author's site visit and the historical exploration work discussed in this Technical Report, it is the opinion of the author that the Pine Grove Property is an early-stage "Property of Merit" warranting further exploration work. The author is unaware of any unusual risk factors, other than those normally associated with early-stage mineral exploration, that might affect future exploration work and potential development of the Property.

## 26 Recommendations

A staged exploration approach is recommended to follow-up on historical anomalies.

A Phase 1 program should include ground geophysical surveying, data compilation, geological mapping and geochemical sampling. During Phase 1a a ground geophysical surveying program should be completed that includes additional IP surveying, along with magnetic and gravity surveys, to further identify and define targets for future drill testing. The estimated cost of the Phase 1a program including contingencies is CDN\$100,000. As part of Phase 1a, a ground magnetics survey was completed in April - May 2021 for a total cost of ~\$80,000. Interpretation of the results is under way. The IP survey recommended as part of Phase 1a remains to be completed.

The Phase 1b program should include a comprehensive compilation and validation of historical data, re-processing, including line by line inversions, re-interpretation of the 2016 heliborne TDEM geophysical survey data along with geological mapping, rock sampling and soil sampling. The cost of the Phase 1b program with contingencies is estimated to be CDN\$100,000. Geological mapping should be completed, with an emphasis on mapping structural zones, alteration and lithology, with the results of the mapping used to prioritize rock, soil and ground geophysical surveys over geologically prospective targets. Soil sampling including Mobile Metal Ion (MMI) surveys or Ionic Leach geochemistry should be completed in areas of the Property covered by thick overburden. The remainder of the Property not covered by the 2012 soil sampling program should be covered with conventional soil samples.

Phase 2 exploration is dependent on the results of Phase 1 and includes a diamond drilling program with associated ground preparation work and a LiDAR survey. The recommended drilling at Pine Grove will test targets generated in Phase 1. A preliminary recommendation of 2,000 m of diamond drilling is recommended at the Pine Grove Property. The estimated cost of the Phase 2 drill program is CDN\$625,000. A LiDAR

survey (light detection and ranging) coupled with photogrammetry using unmanned aerial vehicles (UAVs) is recommended to generate a detailed digital elevation model for the Property. The estimated cost of the LiDAR survey is CDN\$50,000. The estimated total cost of the Phase 2 program is CDN\$675,000 not including GST.

The estimated cost of the recommended work program at the Pine Grove Property is presented in Table 26.1. The cost of the Phase 1 and Phase 2 work is estimated at CDN\$200,000 and CDN\$675,000, respectively not including GST. Phase 2 is dependent upon the results of the recommended Phase 1 work program. Collectively, the work recommendations have a total estimated cost of CDN\$875,000, including contingency funds but not GST.

Table 26.1. Proposed budget for the recomme	ended exploration at the Pine Grove Property.
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Phase 1			
Activity Type			Cost
Phase 1a			
Ground Geophysical Surveying, Processing & Interpretation			\$100,000
Phase 1b			
Data Compilation/Verification			\$5,000
Geophysical Data Re-Processing, Inversions and Interpretation			\$10,000
Geological Mapping & Rock Sampling			\$25,000
Geochemical Surface Sampling			\$50,000
		Contingency	\$10,000
	Phase 1 To	otal Activities Subtotal	\$200,000
Phase 2			
Activity Type	Total (m)	Estimated Cost per metre	
Diamond Drilling	2,000	\$300	\$600,000
Additional Mapping and Drilling Preparation			\$25,000
LiDAR & Photogrammetry			\$50,000
	Phas	e 2 Activities Subtotal	\$675,000
		Grand Total	\$875,000

Bayside Geoscience Inc. STEVEN LANK PRACTISING MEMBER 2695 Steven Differnk, M.Sc., P.Geo Thunder Bay, Ontario, Canada Signing Date: June 23, 2021

#### 27 References

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## 28 Certificate of Author

I, Steven D. Flank, of the City of Thunder Bay, in the Province of Ontario, do hereby certify that:

- 1. I am a member in good standing with the Association of Professional Geoscientists of Ontario (#2695), residing at 124 Sherwood Drive, Thunder Bay, Ontario, P7B 6L1.
- 2. This certificate is to accompany the Report entitled: "Geological Introduction to Emperor Metals Inc.'s Pine Grove Property, Ontario, Canada, with an effective date of June 23<sup>rd</sup>, 2021.
- 3. I attained an H.BSc. in Geology from Lakehead University in Thunder Bay, Ontario (2011) and an M.Sc. in Mineral Exploration from Laurentian University in Sudbury, Ontario (2017).
- 4. I have worked as an exploration geologist for over 10 years focussing on project generation and early-stage gold projects including shear zone hosted lode gold and intrusion related disseminated gold deposits and intrusion related Ni-Cu-PGE deposits.
- 5. I have read the definition of "Qualified Person" set out in NI 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I personally visited and inspected the Pine Grove Property on May 1<sup>st</sup>, 2021, spending eight (8) hours on the property.
- 7. I am solely responsible for all sections in the report entitled "Geological Introduction to Emperor Metals Ltd.'s Pine Grove Property, Ontario, Canada"
- 8. I am an independent "Qualified Person" within the meaning of National Instrument 43-101 Standards of Disclosure for Mineral Projects of the Canadian Securities Administrators.
- 9. I have had no prior involvement with the property that is the subject of this technical report.
- 10. I have read NI 43-101 and Form 43-101F1 and have prepared this report in compliance with the Instrument and Form. I certify that there is no circumstance that could interfere with my judgement regarding the preparation of this technical report. I certify that, at the effective date of the 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.

Effective Date June 23<sup>rd</sup>, 2021 Thunder Bay, Ontario, Canada



Steven D. Flank, M.Sc., P.Geo.

APPENDIX 1 – Summary of historical submitted mineral assessment exploration work for the Pine Grove Property area.

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## Geological Introduction to Emperor Metals Inc.'s Pine Grove Property, Ontario, Canada

Report of Work					
ID	Year	Work Performed By	Description of work		
42C13NE0010	1965	Carravelle Mines Ltd	Airborne Electromagnetic, Airborne Magnetometer		
42C13SW0083	1966	Falconbridge Nickel Mines	Electromagnetic, Magnetic / Magnetometer Survey		
42C13SW0082	1967	Falconbridge Nickel Mines	Electromagnetic, Magnetic / Magnetometer Survey		
42C13SW0080	1967	Falconbridge Nickel Mines	Magnetic / Magnetometer Survey, Other		
42C13SW0090	1969	Caravelle Mines Ltd	Diamond Drilling		
42C13SW0050	1983	Noranda Exploration Co	Magnetic / Magnetometer Survey		
42C13SW0059	1983	Seemar Mines Ltd	Electromagnetic Very Low Frequency, Magnetic / Magnetometer Survey		
42C13SW/0058	1983	Rodeo Resc Ltd	Electromagnetic Magnetic / Magnetometer Survey		
420135W0050	1983	Noranda Exploration Co	Induced Polarization Resistivity		
42C135W0034	1082	Noranda Exploration Co	Diamond Drilling		
42013300073	1905		Airborno Electromagnetic, Airborno Electromagnetic Very Low Frequency		
42612614/0052	1002	Chavin Of Canada Itd	Airborne Electromagnetic, Airborne Electromagnetic Very Low Frequency,		
420135000055	1983		And Donne Magnetonieter		
12012010011	1000		Compliation and Interpretation - Geology, Geochemical, Geological Survey /		
42C13SW0041	1983	Seemar Mines Ltd	Mapping		
42C13SW0052	1983	Rodeo Resc Ltd	Geochemical, Geological Survey / Mapping		
42C13SW0032	1983	Homestake Mineral Dev Co	Assaying and Analyses, Diamond Drilling, Geochemical, Induced Polarization		
42C13SW0054	1983	Noranda Exploration Co	Induced Polarization, Resistivity		
42C13SW0068	1983	Pawnee Oil Corp	Electromagnetic Very Low Frequency, Magnetic / Magnetometer Survey		
			Diamond Drilling, Geochemical, Geological Survey / Mapping, Induced		
42C13SW0012	1984	Homestake Mineral Dev Co	Polarization		
42C13SW0015	1984	Key Lake Expl Ltd	Geological Survey / Mapping		
42C13SW0018	1984	Noranda Exploration Co	Geological Survey / Mapping		
		Brandy Brook Mines Ltd, Key Lake			
42C13SW0014	1984	Expl Ltd	Electromagnetic Very Low Frequency, Magnetic / Magnetometer Survey		
42C13SW0022	1984	Noranda Exploration Co	Airborne Electromagnetic		
		Chavin Of Canada Ltd. Corporate Oil	-		
		& Gas Ltd. New Mcmanus Red Lake	Electromagnetic Very Low Frequency, Geological Survey / Mapping,		
42C13SW0142	1984	Gold Mines Ltd	Magnetic / Magnetometer Survey. Other		
42C13SW0132	1985	Noranda Exploration Co	Geochemical		
420133770132	1909	Brandy Brook Mines Itd Key Jake	Electromagnetic Very Low Frequency, Geochemical, Geological Survey /		
120125W/0110	1086	Evol 1td	Mapping Magnetic / Magnetometer Survey		
420133000119	1980	Brandy Brook Mines Itd Key Lake	Electromagnetic Very Low Frequency Geochemical Geological Survey		
426126140110	1000	Sval Ltd	Manning, Magnetic (Magnetemeter Survey)		
42C13SW0119	1986	Explicite Delabia Fuel Ital			
42013500105	1988	Dolphin Expl Ltd	Geochemical		
42642614/0005	1001	Neverale Evaluation Co	Electromagnetic, Electromagnetic very Low Frequency, Magnetic /		
42C13SW0095	1991	Noranda Exploration Co	Magnetometer Survey		
42C13SW0040	1991 - 1995	A C Turner	Assaying and Analyses, Diamond Drilling, Prospecting By Licence Holder		
42C13SW8713	1992	Noranda Exploration Co	Assaying and Analyses, Diamond Drilling		
42C13SW0002	1992	D Saunders	Electromagnetic Very Low Frequency, Magnetic / Magnetometer Survey		
			Assaying and Analyses, Geochemical, Geological Survey / Mapping,		
42C13NW8755	1992	Noranda Inc (Geco Div)	Miscellaneous Compilation and Interpretation		
			Assaying and Analyses, Electromagnetic, Geological Survey / Mapping,		
42C13SW0103	1993	D Saunders	Overburden Stripping, Prospecting By Licence Holder		
42C13SW0031	1994	B Fowler	Magnetic / Magnetometer Survey, Open Cutting		
42C13NW0003	1994	Noranda Minerals Inc	Compilation and Interpretation - Geology, Diamond Drilling		
			Electromagnetic Very Low Frequency, Magnetic / Magnetometer Survey,		
42C13SW0170	1994 - 1996	Crowbush Minerals Inc	Open Cutting		
42C13SW0123	1995	Hemlo Gold Mines Inc	Induced Polarization, Resistivity		
42C13SW0084	1995	A C Turner	Assaying and Analyses, Diamond Drilling		
			Assaying and Analyses, Bedrock Trenching, Compilation and Interpretation -		
42C13SW0085	1995	Hemlo Gold Mines Inc	Geology		
			0,		
			Assaving and Analyses, Bedrock Trenching, Geochemical, Geological Survey /		
42C13SW0102	1995	Hemlo Gold Mines Inc	Mapping, Prospecting By Licence Holder, Submission of Drill Core		
.2020000102			Geological Survey / Manning Magnetic / Magnetometer Survey Open		
120135110160	1005 - 1006	Battle Mountain Canada Ltd	Cutting		
42013500108	1996	Greater Lenora Resource Corp	Geological Survey / Manning, Prospecting By Licence Holder		
420135000133	1006	Battle Mountain Canada Ltd	Geochemical Prospecting By Licence Helder		
420135W01/1	1006		Ceothernical, Flospetting by Literite HOlder		
42C135W0129	1002	B FOWIER, IVI SNUMAN	ciectromagnetic very Low Frequency		
42C13SW0178	1997	Albert C Turner, Albert Turner	Assaying and Analyses, Diamond Drilling		
42C135W0179	1997	Albert C Turner, Albert Turner	Diamond Drilling		

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## Geological Introduction to Emperor Metals Inc.'s Pine Grove Property, Ontario, Canada

Report of Work				
ID	Year	Work Performed By	Description of work	
-		Kenneth Henry Lambert, Ray Donald		
2000000974	2005	Skogsberg	Linecutting, Magnetic / Magnetometer Survey	
			Assaying and Analyses, Geochemical, Linecutting, Prospecting By Licence	
20000006251	2011	Entourage Metals Ltd	Holder	
20000006271	2011	Entourage Metals Ltd	Assaying and Analyses, Geochemical, Prospecting By Licence Holder	
			Assaying and Analyses, Geochemical, Linecutting, Prospecting By Licence	
20000006756	2011	Entourage Metals Ltd	Holder	
		Brian David Fowler, Entourage		
20000008499	2011 - 2012	Metals Ltd	Assaying and Analyses, Geochemical, Prospecting By Licence Holder	
			Assaying and Analyses, Geological Survey / Mapping, Prospecting By Licence	
20000014687	2014	Rudolf Wahl	Holder, Rock Sampling	
20000014553	2016	Tashota Resources Inc	Airborne Electromagnetic, Airborne Magnetometer	
20000013752	2016	Canadian Orebodies Inc	Airborne Electromagnetic, Airborne Magnetometer	
20000016157	2016	Canadian Orebodies Inc	Assaying and Analyses, Prospecting By Licence Holder, Rock Sampling	
20000013545	2016 - 2017	Tashota Resources Inc	Airborne Electromagnetic, Airborne Magnetometer, Airborne Radiometric	
20000015326	2017	Tashota Resources Inc	Prospecting By Licence Holder, Rock Sampling	

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