



**ANNUAL INFORMATION FORM  
FOR THE YEAR ENDED DECEMBER 31, 2019**

**of**

**POLYMET MINING CORP.**  
(the “Company” or “PolyMet”)

March 30, 2020

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## 1. Introductory Notes

In this Annual Information Form (“AIF”) “PolyMet” or the “Company” refers to PolyMet Mining Corp. and its subsidiaries (unless the context otherwise dictates). All information contained herein is as at March 30, 2020 unless otherwise indicated, other than certain financial information, which is as at December 31, 2019, being the date of the Company’s most recently audited financial year end. All dollar amounts in this AIF are expressed in United States (“U.S.”) dollars, the functional and reporting currency of the Company, unless otherwise indicated.

Additional information related to the Company is available for view on the System for Electronic Document Analysis and Retrieval (“SEDAR”) and EDGAR at [www.sedar.com](http://www.sedar.com) and at [www.sec.gov](http://www.sec.gov), respectively, and on the Company’s website [www.polymetmining.com](http://www.polymetmining.com).

### Cautionary Statement Regarding Forward-Looking Statements

This AIF contains “forward-looking statements”. Within the meaning of applicable Canadian securities legislation and Section 27A of the United States Securities Act of 1933 and Section 21E of the United States Securities Exchange Act of 1934, forward-looking statements are not, and cannot be, a guarantee of future results or events. Forward looking statements are based on, among other things, opinions, assumptions, estimates and analyses that are subject to significant risks, uncertainties, contingencies and other factors that may cause actual results and events to be materially different from those expressed or implied by the forward-looking statement. All statements in this AIF that address events or developments that PolyMet expects to occur in the future are forward-looking statements and are generally, although not always, identified by words such as “expect”, “plan”, “anticipate”, “project”, “target”, “potential”, “schedule”, “forecast”, “budget”, “estimate”, “intend” or “believe” and similar expressions or their negative connotations, or that events or conditions “will”, “would”, “may”, “could”, “should” or “might” occur. These forward-looking statements include, but are not limited to, PolyMet’s objectives, strategies, intentions, expectations, production, costs, capital and exploration expenditures, including an estimated economics of future financial and operating performance and prospects for the possible expansion of the operation based on a PEA-level study and a ramp-up evaluation representing production growth and improved margins mine, life projections, recovery rate and concentrate grade projections, ability to obtain all necessary environmental and government approvals to completion and if undertaking an expansion case, ability to obtain at all, the viability and all information with respect to the ability to develop the Project to additional potential by mining additional resources beyond the permit design at a higher production rate. Prior to any decision to apply for permits to develop the project further, PolyMet would need to complete preliminary and definitive feasibility studies, as well as an analysis of the environmental impact and alternatives of any proposal. In addition, any future proposal would be subject to environmental review and permits, public notice and comment, and approval by appropriate federal and state agencies. All forward-looking statements in this AIF are qualified by this cautionary note.

The material factors or assumptions applied in drawing the conclusions or making forecasts or projections set in the forward-looking statements include, but are not limited to:

- various economic assumptions, in particular, metal price estimates;
- certain operational assumptions, including mill recovery, operating scenarios;
- construction schedules and timing issues; and
- assumptions concerning timing and certainty regarding the environmental review and permitting process.

The risks, uncertainties, contingencies and other factors that may cause actual results and events to differ materially from those expressed or implied by the forward-looking statement may include, but are not limited to, risks generally associated with the mining industry, such as: economic factors (including future commodity prices, currency fluctuations, inflation rates, energy prices and general cost escalation); uncertainties related to the development of the NorthMet Project; dependence on key personnel and employee relations; risks relating to political and social unrest or change, operational risk and hazards, including unanticipated environmental, industrial and

geological events and developments and the inability to insure against all risks; failure of plant, equipment, processes, transposition and other infrastructure to operate as anticipated; compliance with governmental and environmental regulations, including permitting requirements; etc., as well as other factors identified and as described in more detail under the heading “Risk Factors” in Item 5. The list is not exhaustive of the factors that may affect the forward-looking statements. There can be no assurance that such statements will prove to be accurate, and actual results, performance or achievements could differ materially from those expressed in, or implied by, these forward-looking statements. Accordingly, no assurance can be given that any events anticipated by the forward-looking statements will transpire or occur, or if any of them do, what benefits or liabilities PolyMet will derive therefrom. The forward-looking statements reflect the current expectations regarding future events and operating performance and speak only as of the date hereof and PolyMet does not assume any obligation to update the forward-looking statements if circumstances or management’s beliefs, expectations or opinions should change other than as required by applicable law. For the reasons set forth above, undue reliance should not be placed on forward-looking statements.

### **Cautionary Note to U.S. Investors – Information Concerning Preparation of Resource Estimates**

This AIF has been prepared in accordance with the requirements of the securities laws in effect in Canada, which differ from the requirements of United States securities laws. The terms “mineral reserve”, “proven mineral reserve” and “probable mineral reserve” are Canadian mining terms as defined in accordance with Canadian National Instrument 43-101 – Standards of Disclosure for Mineral Projects (“NI 43-101”) and the Canadian Institute of Mining, Metallurgy and Petroleum (“CIM”) – CIM Definition Standards on Mineral Resources and Mineral Reserves, adopted by the CIM Council, as amended. These definitions differ materially from the definitions in the United States Securities and Exchange Commission’s (“SEC”) Industry Guide 7 under the United States Securities Act of 1933, as amended. Under SEC Industry Guide 7 standards, mineralization cannot be classified as a “reserve” unless the determination has been made that the mineralization could be economically and legally extracted at the time the reserve determination is made. As applied under SEC Industry Guide 7, a “final” or “bankable” feasibility study is required to report reserves, the three-year historical average price is used in any reserve or cash flow analysis to designate reserves, and the primary environmental analysis or report must be filed with the appropriate governmental authority.

In addition, the terms “mineral resource”, “measured mineral resource”, “indicated mineral resource” and “inferred mineral resource” are defined in and required to be disclosed by NI 43-101; however, these terms are not defined terms under SEC Industry Guide 7 and are normally not permitted to be used in reports and registration statements filed with the SEC. Investors are cautioned not to assume that all or any part of a mineral deposit in these categories will ever be converted into SEC Industry Guide 7 reserves. “Inferred mineral resources” have a great amount of uncertainty as to their existence, and great uncertainty as to their economic and legal feasibility. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. Under Canadian rules, estimates of inferred mineral resources may not form the basis of feasibility or pre-feasibility studies, except in rare cases. Investors are cautioned not to assume that all or any part of an inferred mineral resource exists or is economically or legally mineable. Disclosure of “contained metal” in a resource is permitted disclosure under Canadian regulations; however, the SEC normally only permits issuers to report mineralization that does not constitute “reserves” by SEC Industry Guide 7 standards as in place tonnage and grade without reference to unit measures.

Accordingly, information concerning mineral deposits contained in this AIF may not be comparable to similar information made by public U.S. companies subject to the reporting and disclosure requirements under the United States federal securities laws and the rules and regulations thereunder.

## Qualified Persons Under NI 43-101

Except where specifically indicated otherwise, the disclosure in this AIF of scientific and technical information regarding PolyMet's mineral properties has been reviewed and approved by the following persons who are Qualified Persons as defined by NI 43-101:

- Zachary J. Black, SME-RM, of Hard Rock Consulting, of Lakewood, CO;
- Jennifer J. Brown, P.G., of Hard Rock Consulting, of Lakewood, CO;
- Nicholas Dempers, Pr. Eng., SAImm, of Senet, of South Africa;
- Thomas L. Drielick, P.E., of M3 Engineering, of Tucson, AZ;
- Art S. Ibrado, P.E., of M3 Engineering, of Tucson, AZ;
- Erin L. Patterson, P.E., of M3 Engineering, of Tucson, AZ;
- Thomas J. Radue, P.E., of Barr Engineering, of Minneapolis, MN;
- Jeff S. Ubl, P.E., of Barr Engineering, of Minneapolis, MN; and
- Herbert E. Welhener, SME-RM, Independent Mining Consultants, of Tucson, AZ.

## 2. Corporate Structure

PolyMet Mining Corp. was incorporated under the *Business Corporations Act* (British Columbia) on March 4, 1981 under the name Fleck Resources Ltd. and changed its name to PolyMet Mining Corp. on June 10, 1998. Through its 100%-owned subsidiary, Poly Met Mining, Inc. ("PolyMet US" and, together with PolyMet Mining Corp., "PolyMet" or the "Company") the Company is engaged in the exploration and development of natural resource properties. PolyMet US was incorporated in Minnesota, United States on February 16, 1989.

The Company's corporate office is located at 100 King Street West, Suite 5700, Toronto, ON M5X 1C7, Canada. The principal executive office is located at 444 Cedar Street, Suite 2060, St. Paul, MN 55101, USA. The registered and records office is located at 2500 – 700 West Georgia Street, Vancouver, B.C. V7Y 1B3, Canada. The operational headquarters are located at 6500 County Road 666, Hoyt Lakes, MN 55750-0475, USA.

## 3. General Development of the Business

### Significant History of the Company

PolyMet's primary mineral property and principal focus is the commercial development of its NorthMet Project ("NorthMet" or "Project"), a polymetallic project in northeastern Minnesota, United States of America, which hosts copper, nickel, cobalt, gold, silver, and platinum group metal mineralization.

The NorthMet ore body is at the western end of a series of known copper-nickel-precious metals deposits in the Duluth Complex. An updated technical report and feasibility study published in March 2018 confirmed the technical and economic viability, positioning NorthMet as the most advanced of the four main deposits in the Duluth Complex: namely, from west to east, NorthMet, Mesaba, Serpentine and Maturi.

### Asset Acquisition

In November 2005, the Company acquired the idled Erie Plant, which is located approximately six miles west of the NorthMet deposit and includes crushing and milling equipment, comprehensive spare parts, plant site buildings, real estate, tailings storage facilities and mine workshops, as well as access to extensive mining infrastructure including roads, rail, water and power. The plant was managed by Cliffs Erie LLC, a subsidiary of Cleveland-Cliffs Inc. (together "Cliffs").

Plans are to refurbish, reactivate and, as appropriate, update the crushing, concentrating and tailings storage facilities at the Erie Plant to produce concentrates containing copper, nickel,

cobalt and precious metals – platinum, palladium, gold and silver. Once commercial operations are established, the Company may install an autoclave to upgrade nickel concentrates to produce a nickel-cobalt hydroxide and a precious metals precipitate.

In December 2006, the Company acquired from Cliffs additional property and associated rights sufficient to provide a railroad connection linking the NorthMet deposit and the Erie Plant. The transaction also included railcars, locomotive fueling and maintenance facilities, water rights and pipelines, administrative offices and land to the east and west of the existing tailings storage facilities.

In June 2018, the Company acquired surface rights over the NorthMet deposit through a land exchange with the United States Forest Service (“USFS”) using land the Company previously owned. With the exchange, PolyMet has total surface rights, including ownership and other use and occupancy rights, to approximately 19,050 contiguous acres or 30 square miles of land including the land at the mine and processing sites, the transportation corridor connecting those sites, and buffer lands.

Mineral rights in and around the NorthMet orebody are held through two mineral leases with RGGGS Land & Minerals Ltd., L.P. (“RGGGS”) and LMC Minerals (“LMC”). The RGGGS lease covers 5,123 acres. Provided the Company continues to make annual lease payments, the lease period continues until June 12, 2048 with an option to extend the lease for up to five additional ten-year periods on the same terms and further extend as long as there are commercial mining operations. The LMC lease covers 120 acres that are encircled by the RGGGS property. Provided the Company continues to make annual lease payments, the lease period continues until December 1, 2028 with an option to extend the lease for up to four additional five-year periods on the same terms. Lease payments to both lessors are considered advance royalty payments and will be deducted from future production royalties payable to the lessor, which range from 3% to 5% based on the net smelter return per ton received by the Company.

#### Permitting

In November 2018, the Company received all final Minnesota Department of Natural Resources (“MDNR”) permits for which the Company had applied, including the Permit to Mine, dam safety, water appropriations, endangered and threatened species takings and public waters work permits, along with Wetland Conservation Act approval.

In December 2018, the Company received all final Minnesota Pollution Control Agency (“MPCA”) permits for which the Company had applied, including the water quality permit, air emission quality permit, and Section 401 Certification.

In March 2019, the Company received the federal Record of Decision (“ROD”) and Section 404 wetlands permit from the United States Army Corp of Engineers (“USACE”), which was the last key permit or approval needed to construct and operate the NorthMet Project. In September 2019, two lawsuits were filed in Minnesota federal court challenging the USACE permits. PolyMet was not named as a defendant in those actions but has moved to intervene.

Legal challenges were filed in the Minnesota Court of Appeals contesting various aspects of the MDNR and MPCA decisions. PolyMet is a co-respondent in all suits.

- In June 2019, the Court of Appeals transferred the challenge to the MPCA water quality permit to the Ramsey County District Court for the limited purpose of an evidentiary hearing. The water quality permit is temporarily stayed pending the outcome of that hearing.
- In January 2020, the Court of Appeals remanded the Permit to Mine and dam safety permits to the MDNR for a contested case hearing. The Company, MDNR, and several other groups have petitioned the Minnesota Supreme Court to review that decision. The Company cited several reasons for the appeal, including (i) the Court of Appeals’ ruling conflicts with both the relevant statute and Supreme Court’s precedent; and (ii) agencies should not be required to hold a contested case hearing when there is no reasonable basis for such a hearing to help them make a decision. PolyMet cannot act on the remanded permits until the Supreme Court

rules or a contested case hearing occurs. In March 2020, the Minnesota Supreme Court granted review of the Court of Appeals ruling on the NorthMet Permit to Mine and dam safety permits.

- In March 2020, the Court of Appeals remanded the air permit to the Minnesota Pollution Control Agency to provide more information and the Company is evaluating all legal options.
- The Court of Appeals ruled in PolyMet's favor in two state court actions, one of which sought to force a supplemental environmental review and the other of which challenged the rules used to permit the Project.

#### USFS Land Exchange

In January 2017, the USFS issued its Final ROD authorizing the land exchange. In June 2018, the Company and USFS exchanged titles to federal and private lands, completing the land exchange giving the Company control over both surface and mineral rights in and around the NorthMet ore body and consolidating the Superior National Forest's land holdings in northeast Minnesota.

Four legal challenges were filed contesting various aspects of the land exchange Final ROD. PolyMet was a co-defendant with the USFS in this proceeding. Motions were filed by PolyMet to dismiss each of these suits for lack of standing. On October 1, 2019, the U.S. District Court for the District of Minnesota dismissed all lawsuits challenging the land exchange Final ROD in favor of PolyMet.

#### Financing

In 2008, PolyMet and Glencore AG, a wholly owned subsidiary of Glencore plc (together "Glencore"), entered into an agreement in which Glencore will market PolyMet's products and provide technical and commercial support. Since 2008, PolyMet and Glencore have entered into a series of financing agreements which has resulted in Glencore owning 71.6% of the Company's issued shares.

### **Three Year History**

The Company's focus over the last three years has been on supporting agency review of permit applications, issuance of draft permits and approvals, issuance of final permits and approvals, defense of permits, site monitoring and permit compliance, maintenance of existing infrastructure, advancing Project engineering and activities to facilitate the transition to construction.

Major highlights and recent events include:

- Following receipt of the final key permit in March, the Company completed geotechnical investigations, installed monitoring wells, advanced project execution planning and implemented its environmental management system;
- In November 2019, the Company's mineral resources and reserves for the NorthMet deposit were updated based on results of the 2018-2019 drilling program resulting in a Proven and Probable Reserve increase of 14% to 290 million tons and a Measured and Indicated Resource increase of 22% to 795 million tons;
- In June 2019, the Company completed a \$265.0 million rights offering, fully backstopped by Glencore with the proceeds used to fully repay outstanding debt and strengthen the Company's financial position. As a result of the rights offering, Glencore's ownership in the Company increased to 71.6%;
- In March 2019, the Company received the federal ROD and wetlands permit from the USACE, which was the last key permit or approval needed to construct and operate the Project;
- In December 2018, the Company received all MPCA permits for NorthMet for which the Company had applied, including air and water permits;

- In November 2018, the Company received all MDNR permits for NorthMet for which the Company had applied, including the Permit to Mine, dam safety and water appropriations permits;
- In June 2018, the Company and USFS completed the federal land exchange giving PolyMet title and control over both surface and mineral rights in and around the NorthMet ore body;
- In March 2018, the Company issued an Updated Technical Report under NI 43-101 incorporating process improvements, project improvements and environmental controls described in the Final Environmental Impact Statement and draft permits. The update included detailed capital costs, operating costs, and economic valuations for the permitted mine plan, as well as discussion of potential future opportunities;
- In March 2018, the Company and Glencore agreed to extend the term of outstanding debentures until March 31, 2019 or certain events (see “Financing Activities” section below), reduce the interest rate on the outstanding debentures, and make available up to \$80 million in additional funding. Proceeds were used to complete permitting, purchase wetland credits and advanced engineering;
- In January 2018, the MDNR released draft Permit to Mine and MPCA released draft water quality permit, draft section 401 certification, and draft air emissions permit; and
- As noted in the permitting section above, a number of legal challenges have been filed contesting various aspects of federal and state decisions. The Company continues to litigate these decisions in state and federal court. It has received favorable final decisions in six cases to date.

#### **Goals and Objectives for the Next Twelve Months**

PolyMet’s objectives include:

- Successfully defend against legal challenges to permits;
- Maintain political, social and regulatory support for the Project;
- Continue engineering and optimization for the Project;
- Finalize Project implementation plan.

The Company is in discussions with various sources of debt and equity finance sufficient to fund on-going permit litigation, Project optimization and construction. Construction and ramp-up to commercial production is anticipated to take approximately thirty months from receipt of construction funding.

## **4. Description of the Business**

The following disclosure relating to the Company’s NorthMet Project is based, in part, on information derived from the 2018 Technical Report prepared by the qualified persons set out in Section 1 of this AIF. Portions of the following information are based on assumptions, qualifications and procedures, which are not fully described herein. Reference should be made to the full text of the 2018 Technical Report, which has been filed with certain Canadian securities regulatory authorities pursuant to NI 43-101 and is available on SEDAR at [www.sedar.com](http://www.sedar.com) and on EDGAR at [www.sec.gov](http://www.sec.gov).

### **Property Description and Location**

#### Project Location

The NorthMet Project comprises two key elements: the NorthMet deposit (or Mine Site) and the Erie Plant. The NorthMet deposit is situated on mineral leases located in St. Louis County in northeastern Minnesota at Latitude 47° 36’ north, Longitude 91° 58’ west, about 70 miles north of



the City of Duluth and 6.5 miles south of the town of Babbitt. The Erie Plant is approximately six miles west of the NorthMet deposit.

The NorthMet deposit site totals approximately 4,300 acres and the Erie Plant site, including the existing tailings basin, covers approximately 12,400 acres. In June 2018, the Company acquired surface rights over the NorthMet deposit through a land exchange with the USFS using land the Company previously owned. With the exchange, PolyMet has total surface rights, including ownership and other use and occupancy rights, to approximately 19,050 contiguous acres (30 square miles) of land including the land at the mine and processing sites, the transportation corridor connecting those sites, and buffer lands.

The NorthMet Project is located immediately south of the eastern end of the historic Mesabi Iron Range and is in proximity to a number of existing iron ore mines including the Peter Mitchell open pit mine located approximately two miles to the north of the NorthMet deposit. NorthMet is one of several known mineral deposits that have been identified within the 30-mile length of the Duluth Complex, a well-known geological formation containing copper, nickel, cobalt, platinum group metals, silver, and gold.

The NorthMet deposit is connected to the Erie Plant by a transportation and utility corridor that is comprised of an existing private railroad that will primarily be used to transport ore, an existing private road that will be upgraded to provide vehicle access, new water pipelines and an electrical power network.

#### Project Ownership

The Company owns 100% of PolyMet US. For the sake of simplicity this summary will for the most part refer to both entities as PolyMet, except when specific differentiation is required for legal clarity.

Mineral rights in and around the NorthMet orebody are held through two mineral leases with RGGGS Land & Minerals Ltd., L.P. ("RGGGS") and LMC Minerals ("LMC"). The RGGGS lease covers 5,123 acres. Provided the Company continues to make annual lease payments, the lease period continues until June 12, 2048 with an option to extend the lease for up to five additional ten-year periods on the same terms and further extend as long as there are commercial mining operations. The LMC lease covers 120 acres that are encircled by the RGGGS property. Provided the Company continues to make annual lease payments, the lease period continues until December 1, 2028 with an option to extend the lease for up to four additional five-year periods on the same terms. Lease payments to both lessors are considered advance royalty payments and will be deducted from future production royalties payable to the lessor, which range from 3% to 5% based on the net smelter return per ton received by the Company.

PolyMet US owns or holds various rights of ownership and use, and other property rights that currently give it control of 100% of the Erie Plant, associated infrastructure, and surface rights which covers approximately 19,050 acres, or 30 square miles.

#### Surface Rights

Surface rights of the NorthMet deposit were held by the USFS until June 2018. The USFS acquired the surface rights from U.S. Steel in 1938 under provisions of the Weeks Act of 1922. U.S. Steel retained certain mining rights, which PolyMet secured under the U.S. Steel Lease, along with the mineral rights.

PolyMet and the USFS proposed and completed a land exchange in June 2018 to consolidate their respective land ownerships and giving the Company control over both surface and mineral rights in and around the NorthMet ore body and consolidating the Superior National Forest's land holdings in northeast Minnesota. In this land exchange, the USFS acquired 6,690 acres of private land in four separate tracts held by PolyMet, to become part of the Superior National Forest and managed under the laws relating to the National Forest System. Already located within the

Superior National Forest boundaries, these lands have multiple uses including recreation, research and conservation. The USFS conveyed 6,650 acres of federally owned surface land to PolyMet, which included the surface rights overlying and surrounding the NorthMet deposit. These lands are located near an area heavily used for mining and mine infrastructure, are consistent with regional land uses, and will generate economic benefits to the region through employment and tax revenues.

#### Royalties and Encumbrances

The NorthMet deposit mineral rights carry variable royalties of 3% to 5% based on the NSR per ton of ore mined. For an NMV of under \$30 per ton, the royalty is 3%, for \$30-35 per ton it is 4%, and above \$35 per ton it is 5%. Both the U.S. Steel lease (RGGs) and the LMC Lease carry advance royalties, which can be recouped from future royalty payments, subject to minimum payments in any year. The US Steel leases were transferred through sale to RGGs although the underlying agreement terms remain the same.

#### Environmental Liabilities

Federal, state and local laws and regulations concerning environmental protection affect the PolyMet operation. As part of the consideration for the purchase of the Erie Plant and associated infrastructure, the Company indemnified Cleveland-Cliffs Inc. ("Cliffs") for reclamation and remediation obligations of the acquired property.

The estimated environmental rehabilitation provision under International Financial Reporting Standards (IFRS) on December 31, 2019 was \$52.525 million based on estimated cash flows required to settle this obligation in present day costs of \$70,480 million, a projected inflation rate of 2.2%, a market risk-free interest rate of 4% and expenditures expected to occur over a period of approximately 30 years. This estimate includes but is not limited to water treatment and infrastructure closure and removal, with costs estimated by PolyMet and its consultants and construction contractors. This estimate has been reviewed and accepted by auditors for PolyMet's financial statements.

#### Permits

PolyMet has received all key permits and approvals from the state and federal agencies required to construct and operate the NorthMet Project. Legal challenges contesting various aspects of the MDNR and MPCA decisions are on-going and have led to court rulings that have impacted the Project timeline. These are discussed in greater detail above and below.

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

#### Accessibility and Climate

Access to the NorthMet Project is by a combination of good quality asphalt and gravel roads via the Erie Plant site. The nearest center of population is the town of Hoyt Lakes, which has a population of about 2,500 people. There are a number of similarly sized communities in the vicinity, all of which are well serviced, provide ready accommodations, and have been, or still are, directly associated with the region's extensive taconite mining industry. The road network in the area is well developed, though not heavily trafficked, and there is an extensive rail network, which serves the taconite mining industry across the entire Range. There is access to ocean shipping via the ports at Taconite Harbor and Duluth/Superior (on the western end of Lake Superior) and the St. Lawrence Seaway.

Climate is continental and characterized by wide temperature variations and significant precipitation.

## Local Resources and Infrastructure

The area has been economically dependent on the mining industry for many years and while there is an abundance of skilled labor and local mining expertise, the closure in 2001 of the LTVSMC open pit mines and taconite processing facility has had a significant negative impact on the local economy and population growth. There are, however, several other operating mines in other parts of the Iron Range. Because of this, the mining support industries and industrial infrastructure remains well developed and of a high standard.

The Erie Plant site is connected to the electrical power supply grid and a main HV electrical power line (138 kV) runs parallel to the road and railroad that traverse the southern part of the mining lease area. PolyMet has a long-term power contract with Minnesota Power.

There are plentiful local sources of fresh water, and electrical power and water are available nearby. Previous operations at the site processed 100,000 STPD with adequate water supply, which is more than three times the plan for PolyMet.

## Physiography

The Mesabi Iron Range forms an extensive and prominent regional topographic feature. The NorthMet Project site is located on the southern flank of the eastern Range where the surrounding countryside is characterized as being gently undulating. Elevation at the NorthMet Project site is about 1,600 ft asl (1,000 ft above Lake Superior). Much of the region is poorly drained and the predominant vegetation comprises wetlands and boreal forest.

## **History**

The NorthMet deposit was formally discovered in 1969 during exploration carried out by U.S. Steel. Between 1969 and 1974, U.S. Steel drilled 112 holes for a total of 113,716 ft, producing 9,475 assay intervals, which are included in the modern-day NorthMet Project database. Assay data from U.S. Steel core samples was not necessarily collected at the time of the original drilling.

A number of historic mineral resource estimates were completed (U.S. Steel, Fleck Resources, NERCO) prior to PolyMet's acquisition of the NorthMet Project. These resource estimates predate current NI 43-101 reporting standards and the associated resource models, electronic or otherwise, are not available for verification.

There is no historical production data to report for the NorthMet Project.

## **Geological Setting and Mineralization**

### Regional Geology

The NorthMet deposit is situated on the western edge of the Duluth Complex in northeastern Minnesota. The Duluth Complex is a series of distinct intrusions of mafic to felsic tholeiitic magmas that intermittently intruded at the base of a comagmatic volcanic edifice during the formation of the Midcontinental rift system between 1108 and 1098 Ma. The intrusives of the Duluth Complex represent a relatively continuous mass that extends in an arcuate fashion from Duluth to the northeastern border between Minnesota and Canada near the town of Grand Portage. Footwall rocks are predominantly comprised of Paleoproterozoic and Archean rocks, the hanging wall rocks are made up of mafic volcanic rocks and hypabyssal intrusions, and internally scattered bodies of strongly granoblastic mafic volcanic and sedimentary hornfels can be found.

### Local and Property Geology

The NorthMet deposit is situated within the Partridge River Intrusion ("PRI"). The PRI has been mapped, drilled, and studied in detail because of its importance as a host for copper-nickel ("Cu-Ni") and iron-titanium ("Fe-Ti") deposits. The PRI consists of varied troctolitic and (minor) gabbroic

rock types that are exposed in an arcuate shape that extends from the Water Hen (Fe-Ti) deposit in the south to the Babbitt (Cu-Ni) deposit in the North. The PRI is bound on the west by the Paleoproterozoic Virginia Formation (slate and graywacke), and to a lesser extent, the Biwabik Iron Formation ("BIF"). The upper portion of the PRI forms a complex contact an assemblage of anorthositic, gabbroic, and hornfelsic rocks. This assemblage is also found as large inclusions within the interior of the PRI. The inclusions are thought to represent earlier roof zone screens that were overlapped by later emplacement of Partridge River intrusion magmas.

### Mineralization

The metals of interest at NorthMet are copper, nickel, cobalt, platinum, palladium, silver, and gold. Minor amounts of rhodium and ruthenium are present though these are considered to have no economic significance. In general, except for cobalt and gold, the metals are positively correlated with copper mineralization. Cobalt is well correlated with nickel. Most of the metals are concentrated in, or associated with, four sulfide minerals: chalcopyrite, cubanite, pentlandite, and pyrrhotite, with platinum, palladium and gold also found as elements and in bismuthides, tellurides, and alloys.

Mineralization occurs in four broadly defined horizons or zones throughout the NorthMet property. Three of these horizons are within basal Unit 1, though they likely will not be discriminated in mining. The upper horizon locally extends upward into the base of Unit 2. The thickness of each of the three Unit 1 enriched horizons varies from 5 ft to more than 200 ft. Unit 1 mineralization is found throughout the base of the NorthMet deposit. A less extensive mineralized zone (the copper-rich, sulfur-poor Magenta Zone) is found in Units 4, 5 and 6 in the western part of the NorthMet deposit.

### **Deposit Types**

The NorthMet deposit is considered a magmatic Copper - Nickel ± platinum group element ("PGE") deposit. These are a broad group of deposits containing nickel, copper and PGEs occurring as sulfide concentrations associated with a variety of mafic and ultramafic magmatic rocks. Magmatic Cu-Ni sulfide deposits with or without PGEs account for approximately 60 percent of the world's nickel production. Magmatic Ni-Cu±PGE sulfide deposits are spatially and genetically related to bodies of mafic and/or ultramafic rocks. The sulfide deposits form when the mantle-derived magmas become sulfide-saturated and segregate immiscible sulfide liquid, commonly following interaction with continental crustal rocks.

The NorthMet deposit is a large-tonnage, disseminated accumulation of sulfide in mafic rocks, with rare massive sulfides. Copper to nickel ratios generally range from 3:1 to 4:1. Primary mineralization is probably magmatic, though the possibility of structurally controlled re-mobilization of the mineralization (especially PGE) has not been excluded. The sulfur source is both local and magmatic. Extensive detailed logging has shown no definitive relation between specific rock type and the quantity or grade quality of sulfide mineralization in the Unit 1 mineralized zone or in other units, though local noritic to gabbro-noritic rocks (related to footwall assimilation) tend to be of poorer PGE grade and higher in sulfur.

### **Exploration**

U.S. Steel commenced mapping and ground surveys of the NorthMet Project in 1967 and initiated drilling exploration in 1968. Drilling has been the primary method of exploration at the NorthMet Project; however, 240 geophysical soundings, numerous test pits, and down-hole geophysical testing have been completed to better understand the depth to bedrock and the lithologic contacts.

### **Drilling**

Prior to PolyMet's involvement in the NorthMet Project, 116 core holes were drilled in the main project area by U.S. Steel and NERCO (see Table 10-1 of the 2018 Technical Report).

PolyMet completed 290 drill holes on the NorthMet Project between 1998 and 2010 totaling 171,332 ft. Some drilling was resumed in 2018 and 2019 following the land exchange. Of the 290 holes, 52 were drilled using reverse circulation, and 238 were diamond core holes.

From 1998 to 2000, 52 vertical reverse circulation ("RC") holes were drilled to supply material for a bulk sample. A portion of these drill-holes twinned U.S. Steel holes, and others served as in-fill over the extent of the NorthMet deposit. The RC holes averaged 474 ft, with a minimum of 65 ft and a maximum depth of 745 ft.

The first PolyMet core drilling program was carried out during the later parts of the RC program, with three holes drilled late in 1999 and the remainder in early 2000. There were seventeen BTW (1.65 inch) and fifteen NTW (2.2 inch) diameter holes all of which were vertical. Three RC holes were re-entered and deepened with AQ core. Core holes averaged 692 ft in depth, with a minimum of 229 ft and a maximum depth of 1,192 ft. (not including RC holes extended with AQ core). These holes were assayed from top to bottom (with minimal exception) on 5-foot intervals. Samples were split into half core at the PolyMet field office in Aurora, Minnesota.

PolyMet's 2005 drilling program had four distinct goals: collection of metallurgical samples, continued in-fill drilling for resource estimation, resource expansion, and collection of oriented core for geotechnical data. The program included 109 holes totaling 77,165 ft, including:

- 15 one-inch diameter holes for metallurgical samples (6,974 ft.) drilled by Boart-Longyear of Salt Lake City (February - March 2005).
- PQ sized holes (core diameter 3.3 inches) totaling 6,897 ft, to collect bulk sample material, and to improve the confidence in the known resource area (February - March 2005).
- 52 NTW sized holes (2.2 inches) totaling 41,403 ft for resource definition.
- 30 NQ2 sized holes (2.0 inches) totaling 21,892 ft for resource definition and geotechnical purposes. The NTW and NQ2 size core was drilled in the spring (February-March) and fall (September-December) of 2005.

Roughly 11,650 multi-element assays were collected from the 2005 drilling program. Another 1,790 assays were performed on previously drilled U.S. Steel and PolyMet core during. Of the 109 holes drilled in 2005, 93 were drilled at an angle. The angled holes were aligned on a grid oriented N34W with dips ranging from -60° to -75°. Sixteen NQ2 sized holes were drilled and marked for oriented core at varying dips, for geotechnical assessment across the NorthMet Project.

In 2007, two drilling programs were conducted, a winter program of 47 holes totaling 19,102 ft and a summer program of 14 holes totaling 5,437 ft. The initial 16 winter holes were NTW sized, the remaining drill holes from both programs were NQ2 core. Most of these holes were angled to north-northwest (azimuth 326°, N34W). The 2007 holes averaged 402 ft in depth, with a minimum of 148 ft and maximum of 768.5 ft.

In 2010, a winter drilling program was conducted with two objectives:

- Collect detailed geostatistical data across a grid in the initial mining area, and
- Develop a geologic and assay framework around the west margin of the deposit.

Secondary to these purposes was the gathering of approximately ten tons of potential bulk sample material.

The grid area in the planned east pit encompassed 8,720 ft of drilling with 1,664 multi-element assays and the western drilling totaled 11,401 ft with 1,345 samples taken. Grid drilling was sampled by elevations representing bench levels. Data from this was used to establish appropriate sampling protocols during mining.

Assay results in the grid area were consistent with expectations from previous block models. In the west, Unit 1 and Magenta Zone ore grade mineralization continue well outside the planned pit boundaries with the furthest hole in this program 2,600 feet to the west of the planned pit edge.

The drilling exploration is summarized in Table 10-1 of the 2018 Technical Report, and drill hole distribution is shown on Figure 10-1 of the 2018 Technical Report.

Core recovery is reported by PolyMet to be upwards of 99% (see table below) with rare zones of poor recovery. Rock quality designation (“RQD”) is also very high, averaging 85% for all units, excluding the Iron formation. Experience in the Duluth Complex indicates that core drilling has no difficulty in producing samples that are representative of the rock mass. Rock is fresh and competent and the types of alteration (when observed: sausserization, uralization, serpentinization and chloritization) do not affect recovery.

**Summary of Core Recoveries and RQD Measurements (includes all drilling through 2010)**

Unit	Recovery Count	Recovery Percentage (%)	RQD Count	RQD Percent
1	8,906	99.9	4,194	91.8
2	1,879	99.5	968	90.3
3	4,374	100	2,632	93.5
4	2,160	100	1,063	96.4
5	1,901	100	838	94.3
6	2,262	100	1,041	94.7
7	951	99.3	396	87.4
Virginia Formation	2,095	99.7	1,069	87.6
Inclusions	62	98.1	57	86.6
Biwabik Iron Formation	381	100	60	79.8
<b>Duluth Complex Average</b>		<b>99.96</b>		<b>92.82</b>

Additional drilling was conducted in 2018-2019 with results noted below.

**Sample Preparation, Analyses and Security**

There are multiple generations of sample analyses that contribute to the overall NorthMet Project assay database:

- Original U.S. Steel core sampling, by U.S. Steel, 1969-1974;
- Re-analysis of U.S. Steel pulps and rejects, selection by Fleck and NRRI, 1989-1991;
- Analysis of previously un-sampled U.S. Steel core, sample selection by Fleck and NRRI in 1989-1991, and 1999-2001;
- Analysis of 2 of the 4 NERCO drill-holes, 1991;
- PolyMet RC cuttings, 1998-2000; and
- PolyMet core, 2000, 2005, 2007, and 2010.

The laboratories utilized by U.S. Steel were not independent of the Company, and no information regarding accreditation is available. All the labs that have provided analytical testing for PolyMet were or currently are fully accredited, independent, commercial labs that are not related to any of the exploration companies or any of its directors or management.

Drill hole and assay data is administered by the Company’s geologic staff from the operational headquarters in Hoyt Lakes. Excel and Gemcom GEMS are used to manage the geologic data. Paper logs are available.

There is no documentation indicating sample handling protocols at drill sites, and only limited documentation of sample handling between the drill site and assay laboratory for programs conducted by U.S. Steel and NERCO.

Employees of PolyMet (or its predecessor, Fleck Resources) have been either directly or indirectly involved in all sample selection since the original U.S. Steel sampling. Sample cutting and preparation of core for shipping has been done by employees or contract employees. Reverse circulation sampling at the rig was done by, or in cooperation with, PolyMet employees and the drilling contractor.

## Core Samples

The diamond drillers remove the drill core samples from the rods and place them into covered core boxes. PolyMet representatives collect the trays and transport them to the core storage facility located near the Erie Plant Site near Hoyt Lakes, Minnesota each day where the core is inventoried prior to processing. Once the geologist is ready to log the hole, the core trays are laid out on core logging tables where all logging takes place prior to sampling.

PolyMet geologists log all drill cores at the core storage facility located near the Erie Plant Site. The geologists record information for each drill hole including the hole number, azimuth, total depth, coordinate datum, drilling company, hole logger, start and end of drilling dates, rock codes, and a written description of stratigraphy, alteration, texture, mineralogy, structure, grain size, ground conditions, and any notable geologic features. The rock quality designation (RQD) and recovery percentage are also recorded.

Sample intervals are determined by the geologist with respect to stratigraphy, mineralization, and sulfide content, otherwise a standard 10-ft interval is sampled. Zones of increased sulfide mineralization >2.5 ft are sampled down to 5-ft intervals. Core within Unit 1 is sampled on 5-ft intervals. Core samples are cut to ¼ or 1/8 of the total core with a diamond bladed saw by trained personnel following written procedures. Each sample is placed in a numbered plastic sample bag with the corresponding sample number tag and placed in a cardboard box for transport to the laboratory. All QA/QC samples are inserted into the sample stream prior to shipment.

Drill core samples are placed into plastic sample bags, sealed, and placed into a cardboard box. The cardboard box is sealed shut with tape and couriered to the laboratory. Once the laboratory has accepted delivery of the samples they remain under the control of the laboratory.

## RC Samples

The RC holes were assayed on 5-ft intervals. Six-inch RC drill-holes produced about 135 lb to 150 lb of sample for every 5 feet of drilling. This material was split using a riffle splitter into two samples and placed in plastic bags and stored underwater in five-gallon plastic buckets. A 1/16th sample was taken by rotary splitter from each 5-ft interval of chip sample for assay. The assay values were used to develop a composite pilot plant sample from bucket samples. Actual compositing was completed after samples had been shipped to Lakefield. A second 1/16th sample was sent to the Minnesota Department of Natural Resources for their archive.

There are 5,216 analyses from the RC drilling in the current PolyMet database. RC sample collection involved a 1/16 sample representing each five-foot run. These were sent to Lerch for preparation, and then sent to ACME or Chemex for analysis.

Chip samples were collected and logged and are currently retained at the warehouse. While the chip sample logging is less precise than logging of core samples, the major silicate and sulfide minerals are identifiable, and the location of marker horizons can be derived based on the composition of the individual samples. The underlying metasedimentary rocks (Virginia Formation) are readily recognized in chip sample, and the base of the NorthMet deposit is relatively easy to define. Where rock recognition is difficult, the higher zinc content of the footwall rocks is used to help define the contact.

## Sample Preparation

Samples were prepared for analysis at Lerch, Acme, or Chemex facilities. In general, all the facilities followed a similar preparation procedure. Samples were crushed to an approximate -10 mesh, prior to being reduced to a 250-gram split for pulverization (149 to 106 µm range). Pulps were split again to separate a sample for the following analyses:

- Base metals (Cu, Co, Mo, Ni and Zn) - Four-acid digestion with ICP-AES finish;
- Base metals (Ag, Cu, Co, Mo, Ni and Zn) – Aqua Regia digestion with ICP-AES finish;
- PGEs (Au, Pt and Pd) – 30 gm fire assay with ICP-AES finish; and

- Total Sulphur by LECO furnace.

Select core samples were crushed to -1/2 inch and placed in a poly bottle, purged with nitrogen, and capped and sealed for special metallurgical and environmental analysis.

#### Quality Assurance/Quality Control Procedures (“QA/QC”)

QA/QC samples used by PolyMet include blanks, standards and field duplicates. PolyMet inserts QA/QC samples into the sample stream at the following frequencies:

- Insertion of coarse blank every 40 samples;
- Insertion of Standard Reference Material (SRM) every 40 samples; and
- Submission of duplicate 1/4 or 1/8 of the drill core every 40 samples.

#### Core Storage and Sample Security

The U.S. Steel core has been stored, either at the original U.S. Steel warehouse in Virginia, Minnesota during drilling, or more recently at the CMRL (now a part of the University of Minnesota). Core has been secured in locked buildings within a fenced area that is locked at night where a key must be checked out. The NERCO BQ size core is also stored at this facility.

The PolyMet core and RC reference samples were stored in a PolyMet leased warehouse in Aurora, Minnesota during drilling and pre-feasibility. Core and samples were then moved in 2002 to a warehouse in Mountain Iron, Minnesota where they remained until 2004. They were then moved to a warehouse at the Erie Plant site in Hoyt Lakes. Access to this warehouse is limited to PolyMet employees.

#### Opinion on Adequacy

Hard Rock Consulting (“HRC”), an independent consulting firm retained by PolyMet, concluded that the sample preparation, security and analytical procedures are correct and adequate for the purpose of the 2018 Technical Report. The sample methods and density were appropriate, and the samples were of sufficient quality to comprise a representative, unbiased database.

#### **Data Verification**

The NorthMet mineral resource estimate is based on the exploration drill-hole database available as of April 17, 2014. Drill hole data including collar coordinates, down-hole surveys, sample assay intervals, and geologic logs were provided by PolyMet in Microsoft Excel spreadsheets. The database was reviewed and validated by HRC prior to estimating mineral resources. The NorthMet database includes 114 (116) historic drill holes, 323 PolyMet drill holes, 240 vertical sounding holes, 15 depths to bedrock test pits, and 47 geologic holes from the surrounding area. Of the 739 drill holes, only 437 drill holes were used in the estimation, although many of the 437 holes include only select analytical information. The database was validated using Leapfrog Geo 3D® Version 2.0.0 software. Validation checks performed prior to loading the database into Datamine’s Studio 3 Version 3.24.25.0 mining software included:

- No overlapping intervals;
- Down-hole surveys at drill-hole collar;
- Consistent drill-hole depths for all data tables; and
- Gaps in the “from – to” data tables.

The analytical information used for the resource estimate includes copper, nickel, platinum, palladium, gold, silver, cobalt and sulfur. All assay values Below Detection Limits (“BDL”) were assigned a value of one half of the detection limit, and missing or non-sampled intervals were assigned a value of zero (0).



HRC reviewed PolyMet's check assay programs and considers the programs to provide adequate confidence in the data. Samples that are associated with QA/QC failures were reviewed and reanalyzed as necessary.

Exploration drilling, sampling, security, and analysis procedures were conducted in a manner that meets or exceeds industry standard practice. All drill cores and cuttings from PolyMet's drilling have been photographed. Drill logs have been digitally entered into an exploration database organized and maintained in Gemcom. The split core and cutting trays have been securely stored and are available for further checks.

### **Mineral Processing and Metallurgical Testing**

The NorthMet deposit is hosted in the Duluth Complex in northeastern Minnesota. A significant amount of metallurgical test work has been conducted on the Duluth Complex; therefore, the general metallurgy of the complex is fairly well understood.

Orway Mineral Consultants ("OMC") in 2014 studied SAG Mill based comminution circuits for the NorthMet Project. This was done to assess if a SAG Mill based circuit would be practical for the NorthMet Project and capable of rationalizing the existing 4-stage crushing circuit (total of 11 crushers) and 12 lines of Rod Mill + Ball Mill grinding circuits in the existing Erie concentrator. Comminution test work results from SGS were interpreted by OMC and used to scope out a SAG mill based comminution circuit to process 32,000 STPD. Further comminution test work was conducted by Hazen Research (Golden, Co.) in 2015 to confirm the comminution parameters.

The development of the current NorthMet flotation process flowsheet was based on test work (SGS, 2015) and includes the following:

- Flotation Test work conducted by SGS Lakefield ("SGS") between 1998 and 2014, and
- Supplementary flotation test work conducted by SGS in 2015 and interpreted by Eurus Mineral Consultants ("EMC") for circuit modeling and flotation plant design.

SGS conducted extensive flotation test work up until 2010. The work covered by SGS included significant amounts of batch and rate flotation test work on a number of samples provided by PolyMet. A flotation process block flow diagram was developed from the results and observations of the initial batch test work conducted by SGS. The process block flow diagram shown in Figure 13-1 in the 2018 Technical Report can be summarized into three main circuits as follows:

- The Bulk Copper-Nickel Flotation circuit;
- The Copper-Nickel Separation Circuit; and
- The Pyrrhotite Flotation Circuit.

Pilot scale test work was conducted by SGS to demonstrate the flowsheet developed for the NorthMet process. The results of the pilot test work are also included in the SGS report.

Additional flotation test work was requested of SGS in 2015 to fill in gaps in the flotation test work. EMC conducted a flotation circuit simulation of the process flow based on the results obtained from both SGS's batch and pilot scale test work. The work that EMC conducted was initially targeted at simulating the pilot plant, and then to producing full production scale results. EMC's simulations were based on a throughput of 32,000 STPD. The results of the simulations were used to review the previous design and update the current process plant design basis and criteria.

A second pilot plant program was carried out by SGS in 2009 to investigate hydrometallurgical processes.

## Mineral Resource Estimates

Zachary J. Black, RM-SME, of Hard Rock Consulting, LLC (“HRC”) is a Qualified Person as defined by NI 43-101 for mineral resource estimation and classification. HRC estimated the mineral resource for the NorthMet Project from drill-hole data constrained by geologic boundaries using an Ordinary Kriging (“OK”) algorithm.

The NorthMet deposit was divided into eight units for geological modeling: the Biwabik Iron Formation including banded iron formation, sedimentary marine rocks of the Virginia Formation that overlie the Biwabik Formation, and five distinct units within the Duluth Complex and overburden.

The Magenta Zone, a smaller mineralized zone that cuts through Units 3 through 7 of the Duluth Complex but resides primarily within Units 5 and 6, was modeled from select intercepts provided by PolyMet US. Grades that were estimated include copper, nickel, cobalt, platinum, palladium, gold, silver and total sulfur.

HRC created a rotated three-dimensional block model in Datamine Studio 3® mining software. The block resource model was estimated using the lithologic boundaries of the Duluth Complex as the basis for an estimation domain. Units 1, 3, 5, 6, 7, the Magenta Zone, and Virginia Formation were all estimated using only samples that resided inside of the defined boundaries. Grades were estimated from 10-foot (ft) down-hole composites using Ordinary Kriging. Composites were coded according to their domain. Each metal was estimated using variogram parameters established by AGP Mining Consultants Inc. (“AGP”) in 2013, which were re-evaluated by HRC and deemed acceptable for use in the current mineral resource estimation.

The mineral resources reported herein are classified as Measured, Indicated and Inferred in accordance with standards defined by the Canadian Institute of Mining, Metallurgy and Petroleum (“CIM”) and prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council on May 10, 2014. Each individual mineral resource classification reflects an associated relative confidence of the grade estimates.

The mineral resources estimated for the NorthMet Project includes 649.3 million tons of Measured and Indicated resources and 508.9 million tons Inferred resources. The resource has been limited to the material that resides above the optimized pit shell. All mineralization below the optimized pit shell has been excluded from any resource classification and is not considered to be part of the mineral resource.

The mineral resource estimate for the NorthMet Project is summarized in the below table. This mineral resource estimate includes all drill data obtained as of January 31, 2016 and has been independently verified by HRC. The Measured and Indicated mineral resources are inclusive of the mineral reserves. Inferred mineral resources are, by definition, always additional to mineral reserves.

Class	Tonnage (Mt)	Grades (Undiluted)							
		Copper (%)	Nickel (%)	Platinum (ppb)	Palladium (ppb)	Gold (ppb)	Cobalt (ppm)	Silver (ppm)	NSR \$/ton
Measured	237.2	0.270	0.080	69	241	35	72	0.97	19.67
Indicated	412.2	0.230	0.070	63	210	32	70	0.87	16.95
M&I	649.3	0.245	0.074	65	221	33	71	0.91	17.94
Inferred	508.9	0.240	0.070	72	234	37	66	0.93	17.66

Source: Hard Rock Consulting, LLC, January 2018

\*Notes:

1. Mineral resources are not mineral reserves and do not have demonstrated economic viability.
2. All resources are stated above a \$7.35 NSR cut-off. Cut-off is based on estimated processing and G&A costs. Metal Prices and metallurgical recoveries used for the development of cut-off grade are presented in Table 14-33 of the 2018 Technical Report.
3. Mineral resource tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.

Based on results of its 2018-19 drilling program, measured and indicated resources increased by 22% to 795 million tons as summarized in the below table. The update mineral resource estimate is based on the same procedures used for the January 2018 mineral resource estimate.

Class	Tonnage (Mt)	Grades (Undiluted)							
		Copper	Nickel	Platinum	Palladium	Gold	Cobalt	Silver	NSR
		(%)	(%)	(ppb)	(ppb)	(ppb)	(ppm)	(ppm)	\$/ton
Measured	351.5	0.240	0.073	64	222	33	71	0.88	19.01
Indicated	443.7	0.230	0.069	61	207	30	68	0.87	17.91
M&I	795.2	0.234	0.071	62	214	31	69	0.87	18.40
Inferred	457.7	0.236	0.067	63	225	32	56	0.87	18.07

Source: Hard Rock Consulting, LLC, July 2019

\*Notes:

1. Mineral resources are not mineral reserves and do not have demonstrated economic viability.
2. All resources are stated above a \$6.34 NSR cut-off. Cut-off is based on estimated processing and G&A costs. Metal Prices used for the development of cut-off grade are \$3.34 per pound copper, \$6.37 per pound nickel, \$33.14 per pound cobalt, \$1,216 per ounce palladium, \$1,023 per ounce platinum, \$1,465 per ounce gold and \$18.62 per ounce silver. The Mineral Resources are considered amenable to open pit mining and are reported within an optimized pit shell. Pit optimization is based on total ore costs of \$5.49/ton processed, mining costs of \$1.15/ton at surface and increasing \$0.02/ton for every 50 feet of depth, and pit slope angles of 48 degrees.
3. Mineral resource tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
4. The Mineral Resources estimation methodology has not changed from the 2018 NorthMet Technical Report.

### Mineral Reserve Estimates

Proven and Probable Mineral Reserves of 254.7 million tons are reported for the NorthMet Project within the final pit design used for the mine production schedule and shown in the below table. All inferred material was classified as waste and scheduled to the appropriate waste stockpile. The final mineral reserves are reported using a \$7.98 NSR cut-off inside the pit design using the diluted grades. Both the mineral resource and mineral reserve estimates take into consideration metallurgical recoveries, concentrate grades, transportation costs, smelter treatment charges and royalties in determining NSR values. The below table also shows the mineral reserves by classification category and grade. The Qualified Person responsible for the Mineral Reserve estimate is Herb Welhener, Vice President of Independent Mining Consultants, Inc. ("IMC").

Class	Tonnage (x 1,000)	Grades (Diluted)							
		Copper	Nickel	Platinum	Palladium	Gold	Cobalt	Silver	NSR
		(%)	(%)	(ppb)	(ppb)	(ppb)	(ppm)	(ppm)	\$/ton
Proven	121,849	0.308	0.087	82	282	41	74.81	1.11	19.87
Probable	132,820	0.281	0.081	78	256	37	74.06	1.02	18.02
<b>Total</b>	<b>254,669</b>	<b>0.294</b>	<b>0.084</b>	<b>80</b>	<b>268</b>	<b>39</b>	<b>74.42</b>	<b>1.06</b>	<b>18.90</b>

Source: IMC, January 2018

\*Notes:

1. Mineral reserve tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
2. All reserves are stated above a \$7.98 NSR cutoff and bound within the final pit design.
3. Tonnage and grade estimates are in Imperial units.
4. Total Tonnage within the pit is 628,499 ktons; average waste: ore ratio = 1.47
5. NSR values include post property concentrate transportation, smelting and refining costs and payable metal calculations.

Based on results of its 2018-19 drilling program, proven and probable reserves increased by 14% to 290 million tons as summarized in the below table.

Class	Tonnage (x 1,000)	Grades (Diluted)							
		Copper (%)	Nickel (%)	Platinum (ppb)	Palladium (ppb)	Gold (ppb)	Cobalt (ppm)	Silver (ppm)	NSR \$/ton
Proven	173,495	0.288	0.083	75	270	39	74.21	1.05	19.84
Probable	116,904	0.288	0.081	76	256	37	73.56	1.08	19.60
<b>Total</b>	<b>290,399</b>	<b>0.288</b>	<b>0.083</b>	<b>75</b>	<b>264</b>	<b>39</b>	<b>73.95</b>	<b>1.06</b>	<b>19.74</b>

Source: IMC, September 2019

\*Notes:

1. Mineral reserve tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
2. All reserves are stated above a \$7.98 NSR cutoff and bound within the final pit design.
3. Tonnage and grade estimates are in Imperial units.
4. Average waste: ore ratio = 1.43
5. NSR values include post property concentrate transportation, smelting and refining costs and payable metal calculations.
6. Estimation methodology has not changed from the 2018 NorthMet Technical Report.

## Mining Methods

### Open Pit Mine Plan

The NorthMet Project contains mineralization at or near the surface that is ideal for open pit mining methods.

Mining is planned on a 7 day per week schedule, with two 12-hour shifts per day. There will be four crews planned to cover the rotating schedule. The mine plan includes 225 million tons of ore at an overall strip ratio of 1.6:1. Mining is planned in three pits: The East Pit, the Central Pit, and the West Pit. As mining of the Central Pit commences, it will extend into the East Pit, thereby joining the pits. The combined pit will be referred to as the East Pit.

The method of material transport evaluated for the 2018 Technical Report is open pit mining using two 36.6-yd<sup>3</sup> hydraulic front shovels as the main loading units with a 22.5-yd<sup>3</sup> front end loader as a backup loading unit. The material will be loaded into 240-ton haul trucks and the ore will be hauled to the rail transfer hopper for rail haulage to the mill or ore surge pile areas, and the waste rock to waste stockpiles or pit backfills.

During the first half of the operation, the more reactive waste rock mined will be placed in two temporary stockpiles (one west of the East Pit referred to as the Category 4 Stockpile, and one south of the East Pit referred to as the Category 2/3 Stockpile), and the least reactive waste rock will be placed in a permanent stockpile north of the West Pit (referred to as the Category 1 Stockpile). Once mining is completed in the East Pit, the more reactive waste rock mined will be placed directly in the East Pit as backfill. The more reactive waste rock in the Category 4 Stockpile (in the location of the future Central Pit) will then be relocated as backfill into the East Pit, thus clearing the area for mining of the Central Pit. The Category 2/3 Stockpile will then be moved into the East Pit as backfill. Once mining is completed in the Central Pit, waste rock will be backfilled into that pit, too. By the end of the mine life, all of the more reactive waste rock will be placed as backfill in the pits. As the least reactive waste rock is mined, it will be placed in the permanent Category 1 Stockpile or in the East and Central Pits as backfill. The three mine pits will flood with water after mining and backfilling are completed, which results in the more reactive waste rock being permanently disposed of subaqueously. The general Mine Site layout, including pits, waste rock stockpiles, ore surge pile, rail transfer facility, and overburden storage and laydown area are shown on Figure 16-1 in the 2018 Technical Report.

## Pre-production Development

The pre-production mine development will be carried out by contractors until bedrock has been uncovered. Clearing, grubbing and harvesting of marketable timber and biomass will be completed as part of Mine Site development and mining. The surface overburden consists of glacial till and peat. Final pre-stripping overburden bank slopes will be maintained at a slope that is not steeper than 2.5H:1V. Excavated peat will be stockpiled in the OSLA or near construction footprints until it can be reused for construction and other on-site reclamation. The remaining glacial till fraction of the overburden will also be removed from the pit footprints and, where necessary, within the stockpile liner footprints, separated based on being saturated or unsaturated, and hauled to the appropriate construction or disposal areas.

Pre-production mine development will utilize on-site construction materials, where possible, including overburden materials and Category 1 waste rock, once available. Additional construction materials will be obtained, as approved by the MDNR. Potential construction materials include waste rock from the state-owned waste rock stockpile located approximately 5 miles west of the Mine Site along Dunka Road, and possibly waste rock and overburden from the inactive LTVSMC Area 5 Mine Site to the north and east of the FTB.

Before mining operations can begin, the Mine Site infrastructure, facilities and water management systems must be developed.

## Production Schedule

The production schedule for the NorthMet Project is driven by the nominal ore rate of 32,000 STPD equivalent to 11.6 million tons per annum (average of 362.5 days per year, or 99% availability) with a 20-year mill life. Mining is planned on a 7 day per week schedule, with two 12-hour shifts per day. The mine plan includes 225 million tons of ore and an overall strip ratio of 1.6:1. The production schedule has been calculated on an annual basis for the life of the mine.

The cutoff grade used for the mine schedule is based on the NSR values assigned to the block model described in Section 15.1.3 of the 2018 Technical Report. The NSR value is based on the diluted metal grades and the dilution approach is described in Section 15.1.2 of the 2018 Technical Report. An elevated cutoff is used in the early mining years to achieve a higher metal content in the mill feed tonnage. Material below mill cutoff is temporarily stockpiled for processing later in the mill schedule. The cutoff to the ore surge pile is \$8.50/t NSR and includes the tonnage between the mill cutoff NSR used in a particular year and the \$8.50/t NSR stockpile cutoff value. The NSR cutoff ranges between \$14.00/t to \$10.00/t during years 1 through 10 and then is \$7.98/t for years 11 through 18. The cutoffs for the mill ore are shown in the below table as part of the annual production schedule. The \$7.98/t NSR cutoff covers the cost of processing, site G&A and waste water treatment on a per ton of ore basis.

The Life of Mine (“LOM”) schedule was developed on an annual basis for all years. Milling of the mined ore begins in month four of Year 1 and ramps up to full production; a total of 7.250 Mt are milled during Year 1, approximately 63% of a full year’s production rate. The yearly mine production schedule showing ore and waste tonnages is presented in the below table.

## Yearly Mine Production Schedule

		Total	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	
<b>Ore Mined</b>	NSR cutoff -->			14.00	14.00	14.00	13.00	11.00	11.00	12.00	11.00	9.00	9.00	7.98	7.98	7.98	7.98	7.98	7.98	7.98	7.98			
	ktons	198,867		7,250	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	6,017		
	DCu, %	0.311		0.348	0.358	0.355	0.334	0.334	0.333	0.334	0.314	0.300	0.280	0.273	0.268	0.274	0.275	0.287	0.292	0.322	0.345			
	DNi, %	0.088		0.103	0.105	0.095	0.087	0.086	0.089	0.097	0.093	0.085	0.083	0.082	0.083	0.083	0.081	0.080	0.081	0.088	0.094			
	Cu-Eq Mill, %	0.617		0.688	0.712	0.716	0.674	0.662	0.664	0.664	0.619	0.597	0.555	0.559	0.562	0.548	0.540	0.563	0.564	0.613	0.650			
<b>Ore to Stockpile (8.50/t NSR cutoff)</b>	ktons	26,133		2,364	4,487	5,254	3,882	1,512	1,799	3,170	2,805	383	477											
	DCu, %	0.171		0.182	0.184	0.182	0.171	0.153	0.160	0.164	0.157	0.137	0.137											
	DNi, %	0.058		0.064	0.062	0.057	0.055	0.052	0.054	0.059	0.058	0.052	0.053											
	CuEq Mill, %	0.348		0.364	0.364	0.370	0.355	0.324	0.324	0.335	0.322	0.293	0.292											
	ktons	26,133																				5,583	11,600	8,950
DCu, %	0.171																				0.171	0.171	0.171	
DNi, %	0.058																				0.058	0.058	0.058	
Cu-Eq Mill, %	0.348																				0.348	0.348	0.348	
<b>Mill Feed</b>	ktons	225,000		7,250	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600	8,950
	DCu, %	0.295		0.348	0.358	0.355	0.334	0.334	0.333	0.334	0.314	0.300	0.280	0.273	0.268	0.274	0.275	0.287	0.292	0.322	0.261	0.171	0.171	0.171
	DNi, %	0.085		0.103	0.105	0.095	0.087	0.086	0.089	0.097	0.093	0.085	0.083	0.082	0.083	0.083	0.081	0.080	0.081	0.088	0.077	0.058	0.058	0.058
	CuEq Mill, %	0.586		0.688	0.712	0.716	0.674	0.662	0.664	0.664	0.619	0.597	0.555	0.559	0.562	0.548	0.540	0.563	0.564	0.613	0.505	0.348	0.348	0.348
	ktons	348,823		25,868	23,913	20,204	24,518	26,888	26,601	17,142	16,743	18,379	19,923	20,400	17,280	15,509	16,440	15,085	16,433	18,030	9,467	0	0	0
Cat 1	212,065		16,686	13,409	13,462	18,810	20,864	20,088	10,802	7,235	10,477	11,283	12,180	10,462	8,637	8,939	7,730	8,177	9,222	3,602				
Cat 2	95,980		4,029	5,191	4,814	4,740	4,830	4,978	4,792	7,307	5,571	5,740	5,637	4,591	4,601	5,425	6,104	6,838	6,895	3,897				
Cat 3	23,490		1,200	1,713	821	810	979	1,166	1,094	1,435	1,710	2,020	2,023	1,623	1,576	1,351	954	1,143	851	1,021				
Cat 4	17,288		3,953	3,600	1,107	158	215	369	454	766	621	880	560	604	695	725	297	275	1,062	947				
<b>Total ktms mined</b>	573,823		35,482	40,000	37,058	40,000	40,000	40,000	31,912	31,148	30,362	32,000	32,000	28,880	27,109	28,040	26,685	28,033	29,630	15,484	0	0	0	
Re-handle, ktms																								
Stockpiled ore to mill	26,133		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,583	11,600	8,950	
Waste rock to pit backfill	60,521		0	0	0	0	0	0	0	0	7,384	7,385	2,000	2,000	2,000	1,000	3,021	2,812	1,000	10,000	18,270	3,649		
<b>Total ktms moved</b>	660,477		35,482	40,000	37,058	40,000	40,000	40,000	31,912	31,148	37,746	39,385	34,000	30,880	29,109	29,040	29,706	30,845	30,630	31,067	29,870	12,599		
			<b>Year -1</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>	<b>Year 12</b>	<b>Year 13</b>	<b>Year 14</b>	<b>Year 15</b>	<b>Year 16</b>	<b>Year 17</b>	<b>Year 18</b>	<b>Year 19</b>	<b>Year 20</b>	

## Water Management System

Water at the NorthMet Mine Site will be segregated as mine water and stormwater. Mine water is defined for the NorthMet Project as water that has contacted surfaces disturbed by mining activities, such as drainage collected on stockpile liners, pit dewatering water, saturated overburden dewatering water, and runoff contacting ore, waste rock, and Mine Site haul road surfaces. Mine water is collected by mine water management systems at the Mine Site. Mine water runoff from the overburden storage and laydown area or saturated overburden will be routed to the FTB or used to backfill the East Pit during later years of the operation. The rest of the mine water would go through treatment by chemical precipitation or membrane separation treatment prior to discharge to the FTB or, after closure, to the Mine Site.

Water at the Plant Site will also be segregated into process water and stormwater. Water collected in the FTB seepage capture systems will be routed to the FTB or WWTS for treatment by membrane separation prior to discharge to wetlands downstream of the FTB seepage capture systems.

Stormwater includes runoff that has not been exposed to active mining activities and includes non-contact, industrial, and construction storm water. These include runoff from natural, stabilized, or reclaimed surfaces, or construction areas consisting primarily of unsaturated overburden or peat. Once areas are reclaimed, runoff is considered stormwater. Stormwater is routed to sedimentation ponds prior to discharge off-site to tributaries to the Partridge River.

A diagram of the Process Plant Water Balance is included in Figure 16-4 in the 2018 Technical Report.

## Railroad

PolyMet will utilize existing, private railroad infrastructure to transport ore from the Mine Site to the Coarse Crusher at the Plant Site, receive incoming process consumables and supplies and to stage outgoing railcars containing the final products on common carrier Canadian National ("CN") track for shipping. The existing private railroad infrastructure was constructed by the original operator, Erie Mining Company, and consisted of two railroads; one for hauling run-of-mine ore from the operating pits to the Coarse Crusher and the second for hauling the product, taconite pellets, to Taconite Harbor on Lake Superior. To insure consistent operations, it was critical to the previous site operators that the two railroads were reliable, therefore the railroad infrastructure was well maintained. The track to be used by PolyMet for ore haulage between the Mine Site and the Plant Site is 136-pound per yard and 140-pound per yard rail, with much of the 140-pound per yard rail being welded. In 1999, a major railroad tie replacement program took place. PolyMet has agreements in place with Cliffs Erie as part of its contract for deed arrangements with Cliffs Erie to utilize the existing railroad lines that will continue to be owned by Cleveland Cliffs.

Two new segments of railroad tracks will be constructed and an ore storage and loading pocket, also known as the rail transfer hopper, will be re-constructed at the Mine Site. The rail transfer hopper is the transfer point where the run-of-mine ore is placed into the side dump rail cars for hauling to the Coarse Crusher.

In addition to the railroads and the loading pocket, infrastructure such as fueling stations, sand towers and maintenance facilities, are in place and will be refurbished and returned to service by PolyMet.

## **Recovery Methods**

### Plant Design

The NorthMet Project plant design is based on utilizing as much of the existing infrastructure as feasible, while ensuring a safe and cost effective operating philosophy by incorporating the latest technology.

The original plan for refurbishing the existing Erie Plant comminution circuit was reviewed and the following was taken into consideration:

- The existing circuit design and equipment is more than 50 years old;
- The plant has been idle for more than 15 years;
- The complex's operational and maintenance requirements associated with running a tertiary and quaternary crushing circuit as well as 12 milling streams; and
- The large number of transfer points associated with the above.

Based on this, the viability of replacing the existing milling circuit with larger, modern mills capable of handling the throughput requirements through a single stream was investigated. A single stream SAG and ball mill circuit with a pebble crusher would mean significant changes to the layout within the concentrator building, but has the following benefits:

- Tertiary and quaternary crushing would no longer be required. This eliminates a large portion of the current circuit which is highly maintenance intensive, and also requires significant dust control measures and building heating requirements;
- The ore storage bin operating and discharge methodology would be changed to allow a greater volume of the bin to be used, while also reducing the number of operating transfer points. This would significantly reduce the dust emissions within the concentrator building;
- The new milling circuit would have variable speed control on both mills allowing for greater process control and adaptability to cater to any potential variability in the upstream and downstream process characteristics;
- New larger mills have greater operating efficiencies and less maintenance requirements, therefore reducing operating costs; and
- Simplified milling control system as a result of reduced service requirements to the mills. These include process water addition points, lubrication systems monitoring, discharge density and grind size control and ore feed.

Based on all of the above, the decision to change the milling philosophy to incorporate a new semi autogenous ball-mill-crushing ("SABC"), circuit was made. The concentrator building was modelled to accommodate the new equipment, while ensuring that the building structure remained as per the original design. The new circuit also allowed for the existing electrical rooms, cranes and process water tanks to be utilized.

Existing equipment was analysed to determine its suitability to the new process. Generally, existing equipment that was found to be compatible with the new process design would require refurbishment. Where possible, the original equipment manufacturers ("OEMs") were utilised to determine the refurbishment requirements and costs.

Detailed plant models were developed to identify existing infrastructure and to determine the space available for the new process equipment. Figure 17-1 in the 2018 Technical Report illustrates the main buildings that would be utilised in the new plant design.

#### Process Plant Flowsheet Development

The overall plant process flows for the NorthMet Project are shown in Figure 17-5 in the 2018 Technical Report.

#### Hydrometallurgical Processing

PolyMet's previous hydrometallurgical recovery process design included two autoclaves and a copper solvent extraction/electrowinning ("SX-EW") circuit to produce copper metal. In addition, the process included the precipitation processes of nickel-cobalt hydroxide and precious metals as value-added by-products.

PolyMet has now simplified this metallurgical process to recover base metals, gold and PGMs. PolyMet intends to construct the plant in two phases:



- Phase I: The Beneficiation Plant consisting of crushing, grinding, flotation, concentrate thickening and concentrate filtration. The Beneficiation Plant will produce and market concentrates containing copper, nickel, cobalt and precious metals; and
- Phase II: In mine year 2, a hydrometallurgical plant is expected to be commissioned to process nickel sulfide and pyrrhotite concentrates, with processing starting in mine year 3. This concentrate stream will be processed through a single autoclave to recover high-grade copper concentrate and recover nickel-cobalt hydroxide and precious metals precipitates as by-products.

The advantages of the phased approach to building the complete plant is to delay capital expenditure by deferring the hydrometallurgical plant. This deferral of costs reduces capital-at-risk in the initial years of production of the NorthMet deposit.

### Water Management

Water will be consumed at the NorthMet Plant Site in both the Beneficiation Plant and the Hydrometallurgical Plant. For the most part, water operations within these two plants would be independent of each other. The only exceptions would be the transfer of flotation concentrates from the Beneficiation Plant to the Hydrometallurgical Plant and the combining of filtered copper concentrate and solution from Au/PGM Recovery in the Copper Concentrate Enrichment process step.

All water that enters the Hydrometallurgical Plant will be recycled at each step of the process. The average annual water demand for the Hydrometallurgical Plant is estimated at 240 gpm, but may vary from 114 to 406 gpm monthly as operating and climatological variations occur. To the extent possible, water used to transport residue to the tailing facility would be returned to the Hydrometallurgical Plant; however, losses may occur via evaporation and storage within the pores of the deposited residue. In addition, spilled fluids will be returned to the appropriate process streams.

### **Project Infrastructure**

The NorthMet Project has a large amount of existing infrastructure that is well established but requires modifications and refurbishment to support the process application. The existing usable infrastructure includes the following:

- 138 kV incoming HV power supply from the Minnesota Power grid
- Power distribution to the existing facilities
- Process plant buildings complete with distribution services
- Administration and site offices
- Site and mine access roads
- Rail network including locomotive services and re-fueling facilities
- Natural gas supply
- FTB with return water barge and pumps
- Mining and plant workshops

A description of the existing and new infrastructure required for the NorthMet Project, along with details of the work required to bring these facilities into operation, is described in detail in Section 18 of the 2018 Technical Report.

### **Market Studies and Contracts**

Saleable products from the NorthMet Project will initially be copper and nickel concentrates under the Phase I scenario. These products will be sold to smelting and refining complexes capable of recovering a number of metals contained in these products. It is estimated copper will contribute 61% of net revenues, nickel 18%, PGMs 18%, cobalt 2%, gold and silver 1%.

Phase II of the NorthMet Project includes construction of a hydrometallurgical facility that will result in upgrading the nickel concentrates into a higher purity nickel-cobalt hydroxide and a precious metals

precipitate. Including copper concentrate sales, it is estimated net revenues will comprise copper 54%, nickel 20%, PGMs 22%, cobalt 2% and gold and silver 2%.

PolyMet has entered into a long-term marketing agreement with Glencore AG (“Glencore”) whereby Glencore will purchase all products (metals, concentrates or intermediate products) on independent commercial terms at the time of sale. Glencore will take possession of the products at site and be responsible for transportation and ultimate sale. Pricing is based on London Metal Exchange with market terms for processing. In the case of copper concentrates, the benchmark is annual Japanese smelter contracts.

### Environmental Studies and Social or Community Impact

The NorthMet Project has undergone extensive state and federal environmental review culminating in publication of the Final Environmental Impact Statement (“FEIS”) in November 2015. The FEIS concluded that the NorthMet Project could be constructed and operated in a manner that meets both federal and state environmental standards and is protective of human health and the environment. The FEIS provides a detailed description of the NorthMet Project, the potential impacts to the environment, and the associated design and mitigating measures. PolyMet made numerous refinements during the environmental review process to incorporate avoidance or mitigation measures that will produce substantial environmental benefits and other advantages to the NorthMet Project.

### Environmental Review and Permitting

In November 2015, the MDNR, USACE, and USFS published the Final EIS and in March 2016, the MDNR issued its decision that the Final EIS met the requirements under the Minnesota Environmental Policy Act.

In November 2018, the Company received all final MDNR permits for which the Company had applied, including the Permit to Mine, dam safety, water appropriations, endangered and threatened species takings, and public waters work permits, along with Wetland Conservation Act approval.

In December 2018, the Company received all final MPCA permits for which the Company had applied, including the water quality permit, air emission quality permit, and Section 401 Certification.

In March 2019, the Company received the federal Record of Decision and Section 404 wetlands permit from the USACE, which was the last key permit or approval needed to construct and operate the NorthMet Project. In September 2019, two lawsuits were filed in Minnesota federal court challenging the USACE permits. PolyMet was not named as a defendant in those actions, but has moved to intervene.

Legal challenges were filed in the Minnesota Court of Appeals contesting various aspects of the MDNR and MPCA decisions. PolyMet is a co-respondent in all suits.

- In June 2019, the Court of Appeals transferred the challenge to the MPCA water quality permit to the Ramsey County District Court for the limited purpose of an evidentiary hearing. The water quality permit is temporarily stayed pending the outcome of that hearing.
- In January 2020, the Court of Appeals remanded the Permit to Mine and dam safety permits to the MDNR for a contested case hearing. The Company, MDNR, and several other groups have petitioned the Minnesota Supreme Court to review that decision. The Company cited several reasons for the appeal, including (i) the Court of Appeals’ ruling conflicts with both the relevant statute and Supreme Court’s precedent; and (ii) agencies should not be required to hold a contested case hearing when there is no reasonable basis for such a hearing to help them make a decision. PolyMet cannot act on the remanded permits until the Supreme Court rules or a contested case hearing occurs. In March 2020, the Minnesota Supreme Court granted review of the Court of Appeals ruling on the NorthMet Permit to Mine and dam safety permits.
- In March 2020, the Court of Appeals remanded the air permit to the Minnesota Pollution Control Agency to provide more information and the Company is evaluating all legal options.

- The Court of Appeals ruled in PolyMet's favor in two state court actions, one of which sought to force a supplemental environmental review and the other of which challenged the rules used to permit the Project.

### Baseline Studies

Extensive baseline studies were completed for the NorthMet Project and are described in Section 4 (Affected Environment) of the FEIS. These studies include extensive data on local lakes and rivers, including: meteorological conditions, ground and surface water, wetlands, hydrology, geotechnical stability, waste characterization, air quality, vegetation (types, invasive non-native plants, and threatened and endangered species), wildlife (listed species and species of special concern, species of greatest conservation need and regionally sensitive species), aquatic species (surface water habitat, special status fish and macroinvertebrates), noise, socioeconomics, recreational and visual resources, and wilderness and other special designation areas. Receipt of all permits necessary to construct and operate the NorthMet Project confirms that the design can meet applicable federal and state standards.

### Environmental Considerations

There are no known environmental issues for the NorthMet Project that cannot be successfully mitigated through implementation of the various management plans that have been developed based on accepted scientific and engineering practices. Adaptive management will be employed at the NorthMet Project by using flexible engineering controls that can be adjusted to continue achieving compliance with applicable water quality standards and permit conditions when site-specific conditions vary. Receipt of all permits necessary to construct and operate the NorthMet Project confirms that the design can meet applicable federal and state standards.

### Waste Management

PolyMet plans to re-use an existing taconite tailings basin for storage of NorthMet's Flotation Tailings. The stability and design of the FTB have been investigated and reviewed by numerous geotechnical consultants, including Barr Engineering, Knight Piésold, Scott Olson (geotechnical professor at the University of Illinois), and Dirk Van Zyl (University of British Columbia). The results and recommendations of these third-party peer reviews have been incorporated into the design and operating plans for the FTB, which is fully permitted following review by applicable regulatory agencies and their independent experts.

The results of PolyMet's waste characterization program were used for multiple purposes in support of the design, environmental review, and permitting of the NorthMet Project. At early stages of Project design, results from the waste characterization program were used to form the conceptual models for metal leaching and potential acid generation from Project materials. The characterization data on mineralogy, petrology, chemistry (including dissolved solids release), acid-base accounting, and static leach tests on Project materials were used to identify the minerals with potential to release metals or acidity during weathering, and the NorthMet Project-specific mechanisms that are expected to consume acidity. Results from the waste characterization program were used to identify the sulfur criteria thresholds used to classify waste rock as part of the NorthMet Project's waste rock management program.

Custom test work on tailings deposition, conducted by Saint Anthony Falls Laboratory, University of Minnesota, informed decisions on management of the Flotation Tailings. Additional custom test work on potential interactions between Flotation Tailings and LTVSMC tailings was used to identify potential chemical interaction, or lack thereof, that would need to be incorporated into predictions of the chemistry of the FTB seepage. In the case of the hydrometallurgical residue, waste characterization results were used to compare leachate chemistry with criteria values for classification of hazardous waste.

In addition to the testing listed above, results from the waste characterization program were used to define input parameters for PolyMet's probabilistic water models developed to predict water quantity and quality at the Mine Site and the Plant Site used for environmental review and permitting. Input parameters from PolyMet's waste characterization program included constituent release rates, concentration caps, constituent flushing loads, time lag to formation of acidic conditions, and parameters that are used to model residual saturation of Flotation Tailings.

Receipt of all permits necessary to construct and operate the NorthMet Project confirms that the design can meet applicable federal and state standards.

### Water Management

The overall NorthMet Project water management strategy includes reusing water from the Mine Site at the Plant Site, as well as reusing water within various Plant Site facilities, to maximize water recycling and minimize discharges to the environment. Water will be treated using chemical precipitation and/or membrane separation treatment. Treated water discharge will be used to augment streamflow, where needed, in watersheds around the FTB. The NorthMet Project design includes systems for managing and monitoring water to comply with applicable surface water and groundwater quality standards at appropriate compliance points. PolyMet designed the water management systems to achieve compliance based on modeling of expected water quantity and quality (see Section 16-8 in the 2018 Technical Report). The key treatment technologies include membrane filtration and high-density sludge chemical precipitation. Additionally, PolyMet has created adaptive management and contingency mitigation procedures for water management that it will utilize as necessary to maintain regulatory compliance.

### Air Management

PolyMet will use air pollution control techniques common to mining and other industrial operations. These control techniques include fabric filters, venturi and packed-bed scrubbers, and fugitive dust control procedures at various facilities, locations, and phases within the NorthMet Project to provide levels of emission control that will protect human health and the environment.

The MPCA, pursuant to its authority under state law and under the federal CAA as delegated by the USEPA, is responsible for the air permitting for the NorthMet Project. PolyMet's air permit contains achievable terms and conditions to protect human health and the environment as applicable to air quality management.

### Land Management

PolyMet has control of the mineral rights necessary for the NorthMet Project. Control of the surface rights at the Mine Site were the subject of the land exchange with the USFS. As noted above, the USFS issued its ROD on January 9, 2017 and on June 28, 2018, the Company acquired surface rights over the NorthMet deposit through a land exchange with the USFS using land the Company previously owned. With the exchange, PolyMet has total surface rights, including ownership and other use and occupancy rights, to approximately 19,050 contiguous acres (29.8 square miles) of land including the land at the mine and processing sites, the transportation corridor connecting those sites, and buffer lands.

### Treaties and Indigenous Groups

The NorthMet Project area is located within the territory ceded by the Chippewa of Lake Superior to the United States in 1854. The Chippewa hunt, fish, and gather on lands in the 1854 Ceded Territory. Harvest levels and other activities are governed by either individual tribal entities (in the case of the Fond du Lac Band) or the 1854 General Codes and subsequent Amendments under the 1854 Treaty Authority (in the case of the Grand Portage and Bois Forte bands). Pursuant to Section 106 of the National Historic Preservation Act, the federal Co-lead Agencies identified several historic properties in consultation with the State Historic Preservation Office ("SHPO"), Bands, and PolyMet. A Memorandum of Agreement under Section 106 was signed by PolyMet, USFS, USACE, and SHPO in December 2016.

## Closure Plan and Financial Assurance

PolyMet plans to build and operate the NorthMet Project in a manner that will facilitate concurrent reclamation, in order to minimize the portion of the NorthMet Project that will need to be reclaimed at closure.

The overall objectives of the Closure Plan are to meet the following criteria:

- The closed Mining Area or portion is safe, secure, and free of hazards;
- It is in an environmentally stable condition; and
- It minimizes hydrologic impacts and the release of hazardous substances that adversely affect natural resources; and it is maintenance free.

As a condition of receiving the Permit to Mine, financial assurance instruments covering the estimated cost of reclamation, should the mine be required to close in the upcoming year, were submitted and approved by the MDNR. Minnesota Rules require PolyMet to annually update its financial assurance. This process acknowledges possible future changes to the financial assurance, including possible changes based on any revisions to applicable law or to the mine plan. These costs have been accounted for in the overall project economics. For purposes of the 2018 Technical Report, PolyMet has assumed that the Minnesota water quality standards governing sulfate in wild rice water will be revised, as required by law, after the NorthMet Project is in operations.

## **Capital and Operating Costs**

Capital and operating costs for the NorthMet Project were developed and estimated based on feasibility-level design and engineering performed by Senet, Barr, IMC, Krech Ojard (KO) and M3. Site inspections were conducted (with vendors where possible) to evaluate the condition of the plant, the mine and the equipment.

## Capital Cost Estimates

The capital cost estimate is divided into the following major sections:

- Mine capital, including cost estimates for mine site development and major mining equipment;
- Mine ore loadout and railroad refurbishment costs;
- Comminution, processing, utilities and plant refurbishment costs;
- Costs to build out the existing tailings basin; and
- Water treatment and management costs.

The capital cost estimate is based on the following assumptions:

- The NorthMet Project utilizes a 20-year mine plan;
- Final operating permits will not result in material changes to mine or plant design; and
- Most process equipment will be procured and fabricated in the US and is transportable by road or rail.

The below table depicts the initial direct capital requirement for the development of the NorthMet Project. This estimate includes capital costs compiled by the firms associated with numerous scopes of work for the mine, mine equipment and refurbishing the Erie Plant (Phase I) which have been escalated to reflect Q4 2017 pricing.

#### Phase I Direct Costs

Description	PHASE I
***DIRECT COST***	(\$000)
<b>MINE CAPEX</b>	
Mine Site	<b>65,395</b>
Construction Material Testing	<b>1,490</b>
Mine Equipment	<b>99,710</b>
<b>RAILROAD AND ORE DELIVERY</b>	<b>20,200</b>
<b>COMMINATION</b>	<b>135,013</b>
<b>COPPER &amp; NICKEL CONCENTRATION</b>	<b>120,609</b>
<b>CONCENTRATES LOADOUT FACILITIES</b>	<b>49,895</b>
<b>WATER MANAGEMENT</b>	<b>62,651</b>
<b>PLANT CONTROL SYSTEM (PCS)</b>	<b>1,919</b>
<b>FLOTATION TAILINGS BASIN</b>	<b>39,684</b>
<b>PLANT INFRASTRUCTURE</b>	<b>10,879</b>
<b>PLANT UTILITIES</b>	<b>99,245</b>
<b>Subtotal DIRECT COST (MINE &amp; CONCENTRATOR)</b>	<b>706,690</b>

The capital costs for the Phase II Hydrometallurgical Plant, as set out in the below table, were developed by M3 and were based on the following:

- Recent quotations (Q4 2016 and Q1 2017) were obtained for new mechanical equipment based on detailed enquiries including specifications and equipment duty sheets. The mechanical equipment was sized based on test work results, system modelling and in certain cases equipment sizing was dictated by physical layout/foot print constraints.
- Preliminary designs for new structures, bins and chutes.
- Preliminary civil and earthworks designs associated with the new structures, equipment and operational requirements including access and spillage containment.
- Priced piping and valve MTOs developed from preliminary PFDs and General Arrangement drawings.
- Quotations for electrical and instrumentation equipment based on recent enquiries, including installation on similar projects.
- A complete instrument index including a comprehensive BOM was developed and issued for pricing.
- Man-hour estimations for the installation of new equipment, electrical, instrumentation, structures and associated civil works. These were based on industry standards.

**Phase II Direct Costs (Hydrometallurgical Plant)**

***DIRECT COST***	PHASE II (\$000)
<b>HYDROMET</b>	
Site General	24,152
Ni-Cu Concentrate Oxidative Leaching	68,880
Au/PGM Recovery	3,780
Cu Concentrate	3,743
Cu Sulfide Precipitation	1,621
Iron/Acid Removal	5,808
Mixed Hydroxide Precipitation	3,486
Magnesium Removal	736
Hydromet Tailings	840
Hydrometallurgical Residue Facility	43,903
Reagent Storage and Mixing	15,671
Plant Scrubber	1,591
Hydromet Raw Water	1,647
Hydromet Process Water	1,241
Steam Systems	1,085
Gas Systems	784
<b>Subtotal DIRECT COST (PHASE II)</b>	<b>178,966</b>

The following table depicts the estimated direct and indirect capital costs for the development of the NorthMet Project for Phases I and II.

**Direct and Indirect Costs (Phase I & II)**

	PHASE I (\$000)	PHASE II (\$000)
<b>TOTAL DIRECT COST (Excluding Mine Equipment)</b>	<b>606,980</b>	<b>178,966</b>
FREIGHT - LOGISTICS	19,393	7,017
MOBILIZATION, TEMPORARY FACILITIES AND POWER		4,523
<b>TOTAL CONSTRUCTED COST</b>	<b>626,373</b>	<b>\$190,506</b>
EPCM	90,999	32,196
COMMISSIONING	7,790	1,394
CAPITAL SPARES		929
<b>TOTAL CONTRACTED COST</b>	<b>725,162</b>	<b>225,025</b>
CONTINGENCY	71,597	33,754
AVERAGE CONTINGENCY	9.9%	15%
ADDED OWNER'S COST (including initial fills & reagents)	24,489	
<b>TOTAL CONTRACTED AND OWNER'S COST</b>	<b>821,248</b>	<b>258,779</b>
Owner's Cost Mine Equipment (Initial Capital)	99,710	
Haul Truck Tire Adjustment	(900)	
EIP Credits	25,065	
<b>TOTAL EVALUATED PROJECT COST</b>	<b>945,124</b>	<b>258,779</b>
<b>COMBINED TOTALS</b>	<b>1,203,903</b>	

### Operating Cost Estimates

The following table is a summary of the mine operating costs for the NorthMet Project by the major categories of labor, consumables and repair parts.

#### **Mine Operating Costs by Process**

<b>CATEGORY</b>	<b>(\$000)</b>	<b>% of Total Mining Cost</b>
Drilling	50,662	5.6
Blasting	97,144	10.7
Loading	99,297	11.0
Hauling	257,502	28.5
Auxiliary	147,737	16.3
General Mine	32,512	3.6
General Maintenance	33,888	3.7
Mine G&A	98,338	10.9
Locomotive	79,884	8.8
Other	1,587	0.2
Analytical Lab Contract	6,000	0.7
<b>TOTAL MINING COST</b>	<b>904,553</b>	<b>100</b>

The following table is a summary of the operating cost estimates for PolyMet's Erie Process Plant and assay costs.

#### **Phase I Operating Cost Estimate Summary**

		<b>32,000 STPD</b>	
<b>OPEX Parameter</b>	<b>Units</b>	<b>Value</b>	<b>Fraction (%)</b>
Tonnage Processed	tpa	11,600,000	
Labor	USD/t	1.04	15.9
Power	USD/t	2.11	32.2
Natural Gas	USD/t	0.27	4.1
Consumables/Water Treatment	USD/t	2.44	37.3
Maintenance Supplies & Plant Vehicles	USD/t	0.66	10.1
Assay Costs	USD/t	0.02	0.3
<b>Phase I Plant Costs</b>	<b>USD/t</b>	<b>6.55</b>	<b>100</b>



M3 developed the on-site operating costs associated with the hydrometallurgical plant (or Phase II) which are summarized by cost element of labor, electric power, reagents, maintenance parts and supplies and services in the below table.

#### Phase II Operating Cost Estimate Summary

		32,000 STPD	
OPEX Parameter	Units	Value	Fraction (%)
Tonnage Processed	tpa	11,600,000	
Labor	USD/t	0.21	9.9
Power	USD/t	0.11	5.2
Consumables and Reagents	USD/t	1.17	55.2
Maintenance	USD/t	0.57	26.9
Supplies & Services	USD/t	0.06	2.8
<b>Phase II Plant Costs</b>	<b>USD/t</b>	<b>2.12</b>	<b>100</b>

Additional detail concerning operating costs for the NorthMet Project are set out in Section 21 of the 2018 Technical Report.

#### Economic Analysis

The following economic analysis of the NorthMet Project was prepared on the basis of processing 225 million tons of ore at a mining rate of 32,000 STPD (11.6 million tons per annum) for 20 years. Financial analysis was performed to determine the Net Present Value (“NPV”), payback period (time in years to recapture the initial capital investment) and the Internal Rate of Return (“IRR”) for the NorthMet Project. Annual cash flow projections were estimated over the anticipated life of the mine (20 years) based on estimates of capital expenditures, production cost and sales revenue. The sales revenue is based on the estimated production of copper and nickel concentrates containing PGMs, cobalt, and precious metals. The economic analysis uses the estimated capital expenditure and site production costs developed for the NorthMet Project and presented in Section 21 of the 2018 Technical Report. Financial projections have not been audited by the Company’s independent registered public accounting firm.

The following economic analysis reflects PolyMet’s plan to build the NorthMet Project in two phases (with Phase II being the addition of a Hydrometallurgical Plant):

- Phase I: produce and market copper and nickel concentrates containing copper, nickel, PGMs, cobalt and precious metals; and
- Phase II: once processed via Phase I, continue processing the nickel concentrate through a single autoclave, resulting in production and sale of value added nickel-cobalt hydroxide, and precious metals precipitate products.

Life of mine, and the first five years at full production (years 2-6), economic assumptions and highlights for Phase I and Phase I & II combined are shown in the below table.

### LOM Operating Cost Highlights – Phase I and Phase I & II Combined

Cost Category	UOM	Phase I	Phase I & II
Capital Costs			
Initial Capital	\$ millions	945.1	1,203.9
LOM Sustaining Capital	\$ millions	220.6	220.6 <sup>(1)</sup>
Operating Costs			LOM
Mining & Delivery to Plant	\$/st processed	4.02	4.02
Processing	\$/st processed	6.55	8.66
G&A	\$/st processed	0.48	0.48
<b>Total</b>	<b>\$/st processed</b>	<b>11.05</b>	<b>13.16</b>
LOM Average Annual Payable Metal in Cons Produced			
Copper	000 lbs	54,792	57,754
Nickel	000 lbs	6,646	8,711
Cobalt	000 lbs	281	311
Platinum	koz	8	14
Palladium	koz	42	59
Gold	koz	2	4
Silver	koz	48	48
Average Annual Payable Metal in Cons Produced (Yrs 2-6)			
Copper	000 lbs	66,748	69,384
Nickel	000 lbs	7,867	9,647
Cobalt	000 lbs	333	352
Platinum	koz	12	19
Palladium	koz	58	73
Gold	koz	3	6
Silver	koz	68	68

<sup>1</sup> Sustaining capex for Phase II is included as an OPEX cost for replacement parts piping liners etc for Hydromet plant.

Base Case metal price assumptions, process plant recoveries and key operating data for the average over the life of mine are presented in the below table.

### 32,000 STPD Base Case (Phase I) Price and Operating Assumptions and Key Production Numbers

	Base Case (\$/lb or \$/oz)	Metal Recovery to Conc. (%)	Production (million lbs or oz)	Contribution to net revenue (%)	Cash Cost per lb Cu Eq Cu Eq\$/lb or \$/oz	Cash Cost per lb Cu by-product \$/lb or \$/oz
	Assumptions			LOM		
<b>Phase I</b>						
Copper (lb)	3.22	91.8	1,096	60.5	1.91	1.06
Nickel (lb)	7.95	63.5	133	18.1		
Cobalt (lb)	20.68	35.9	5.6	2.0		
Platinum (oz)	1,128	73.4	170	3.3		
Palladium (oz)	973	78.1	836	13.9		
Gold (oz)	1,308	58.9	45	1.0		
Silver (oz)	18.92	56.9	958	0.3		
Low-grade Nickel PGM (Ktonne)	55.00	N/A	912	0.9		

During years 2 through 6 of full-scale production for Phase I, cash costs of production (excluding amortization of capital) on a co-product basis (allocating costs to each metal according to its contribution to revenue) are projected at \$1.71/lb for copper.

### Base Case (Phase I & II) Price and Operating Assumptions and Key Production Numbers

	Base Case (\$/lb or \$/oz)	Metal Recovery to Conc. (%)	Production (million lbs or oz)	Contribution to net revenue (%)	Cash Cost per lb Cu Eq	Cash Cost per lb Cu
					Cu Eq\$/lb or \$/oz	by-product \$/lb or \$/oz
Assumptions			LOM			
<b>Phase I &amp; II</b>						
Copper (lb)	3.22	91.8	1,155	54.3	1.79	0.59
Nickel (lb)	7.95	63.5	174	20.2		
Cobalt (lb)	20.68	35.9	6.2	1.9		
Platinum (oz)	1,128	73.4	286	4.7		
Palladium (oz)	973	78.1	1,189	16.9		
Gold (oz)	1,308	58.9	86	1.6		
Silver (oz)	18.92	56.9	958	0.3		
Low-grade Nickel PGM (Ktonne)	55.00	N/A	175	0.1		

The key estimated financial results for Phase I and combined Phase I and II for the NorthMet Project are presented in the below table.

### Financial Summary – 32,000 STPD

	Units	Phase I		Phase I & II
		First 5 Yrs <sup>1</sup>	LOM	LOM <sup>2</sup>
Life of Mine	Yrs		20	20
Material Mined	Mt	197	574	574
Ore Mined	Mt	58	225	225
Waste: Ore Ratio		2.4	1.6	1.6
Ore Grade				
Copper	%	0.343	0.295	0.295
Nickel	%	0.092	0.085	0.085
Cobalt	ppm	76	75	75
Palladium	ppm	0.327	0.269	0.269
Platinum	ppm	0.099	0.079	0.079
Gold	ppm	0.048	0.039	0.039
Annual Payable Metal Produced				
Copper	mlb	66.7	54.8	57.8
Nickel	mlb	7.9	6.6	8.7
Cobalt	mlb	0.33	0.28	0.31
Palladium	koz	57.6	41.8	59.4
Platinum	koz	12.4	8.5	14.3
Gold	koz	3.4	2.2	4.3
Copper Equivalent <sup>3</sup>	mlb	112.4	90.6	106.4
Cash Costs: by-product	\$/lb Cu	0.67	1.06	0.59
Cash Costs: Cu equivalent	\$/lb CuEq	1.71	1.91	1.79
Development Capital	\$M	945	945	1,204
Sustaining Capital	\$M	99	221	221
Annual Revenue	\$M	362	292	343
Annual EBITDA	\$M	170	118	152
NPV <sub>7</sub> (After Taxes)	\$M		173	271
IRR (After Taxes)	%		9.6	10.3
Payback (after taxes, from first production)	Years		7.3	7.5

<sup>1</sup> Represents first five years at full concentrator production.

<sup>2</sup> Phase II production is projected to commence in Year 3 of operations.

<sup>3</sup> Cu Eq recovered payable metal, is based on prices shown in Table 1-4 of the 2018 Technical Report, mill recovery assumptions shown in Table 15-3 of the 2018 Technical Report and Hydromet Phase II recoveries shown in Table 13-14 of the 2018 Technical Report.

Key estimated Phase I results include a pre-tax IRR of 10.2%, a pre-tax NPV@7% of \$217 million, an after-tax IRR of 9.6%, an after-tax NPV@7% of \$173 million and an after-tax payback period of 7.3 years.

Key estimated Phase I and II combined results include a pre-tax IRR of 10.9%, a pre-tax NPV@7% of \$322 million, an after-tax IRR of 10.3%, an after-tax NPV@7% of \$271 million and an after-tax payback period of 7.5 years.

### **Adjacent Properties**

There are no adjacent properties that PolyMet is proposing to explore or drill as part of any drilling program or other evaluation. There are several other deposits in the Duluth Complex, including the Mesaba project owned by Teck Resources Limited, Serpentine owned by Encampment Resources, and the Maturi project owned by Twin Metals Minnesota, a wholly owned subsidiary of Antofagasta plc.

### **Other Relevant Data and Information**

#### Project Implementation

The proposed execution of the NorthMet Project assumes a seamless transition between critical project phases, minimal project interruptions and a reduction in potential risks.

The NorthMet Project implementation would consist of the following phases:

- Engineering – Basic and Detailed;
- Demolition; and
- Construction.

It is anticipated that the stages may somewhat overlap depending on receipt of final approvals.

This approach assumes that all work associated with asset preservation will be accomplished prior to demolition. Asset preservation includes the removal of all asbestos, mold, and lead paint as well as some basic infrastructure repairs such as repair of the fire water loop and pumping system.

#### Potential Opportunities

PolyMet has considered opportunities to improve annual operating costs and LOM strategies at the NorthMet Project using the existing block resource model tons and grades as a basis for alternate economic scenarios. The scenarios presented in this section should not be misconstrued as proposals or detailed plans or strategies. Preliminary and definitive feasibility studies, as well as an analysis of environmental impacts would be required prior to any decision to pursue these opportunities. Because the steps in this process have not been undertaken, the results presented in this section should be considered speculative.

In addition, any future project proposal would be subject to additional environmental review and permitting requirements and or public notice and comment, and approval by appropriate federal and state agencies. The NorthMet FEIS evaluates the reasonably foreseeable environmental effects of the NorthMet Project based in part on a mine plan that identified an average production rate of 32,000 STPD (approximately 225 million short tons over the 20-year life of the mine).

A preliminary investigation was undertaken to evaluate the potential of developing the NorthMet deposit to achieve higher throughputs than the current 32,000 STPD. In particular, and subject to the caveats above, the following two additional scenarios were evaluated at a PEA-level for the NorthMet deposit: (i) increase the daily mill feed rate to 59,000 STPD and mine to the completion of the West Pit design; and (ii) increase the daily mill feed rate to 118,000 STPD by expanding the pit limits outside the current permit limits. It is important to note that both the 59,000 STPD and 118,000 STPD scenarios include materials classified as inferred in addition to measured and indicated. Inferred material is considered too poorly defined to include in most mine planning exercises except at the PEA level and are too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves.

Hence, the results predicted for the 59,000 STPD and 118,000 STPD throughput are speculative and may not be realized.

PEA level initial and sustaining capital estimates were developed for the 59,000 and 118,000 STPD scenarios, as were operating costs for each scenario. For the 118,000 STPD scenario, M3 developed an estimate from current 2017 budgetary quotes and quotes from recently constructed projects of similar size. In some cases, costs were scaled from the original estimate using the “0.6 power rule” formula:

$$Cost_2 = Cost_1 \times \left( \frac{Throughput_2}{Throughput_1} \right)^{0.6}$$

Examples of scaled costs from the 32,000 STPD CAPEX include revised civil/site work estimates, reagent & clear service pumps, HVAC, material quantity take-offs for structural steel and concrete, as well as piping and electrical allowances. For 59,000 STPD, cost estimates for the 32,000 STPD case were escalated to reflect current fourth quarter 2017 pricing using an ENR factor and then scaled using the 0.6 power rule to meet the new tonnage. In a few cases, the modifications/additions in plant equipment and process needs listed above were estimated separately and added to escalated totals. Capital costs for the 59,000 & 118,000 scenarios are presented in the below table.

#### LOM Operating Highlights for 59,000 STPD & 118,000 STPD

Operating Plan	Unit of Measure	59,000 STPD		118,000 STPD	
		Phase I	Phase I & II	Phase I	Phase I & II
Mineralized Material Processed	<i>Million st</i>	293	293	730	730
Operating Life	<i>years</i>	15	15	19	19
LOM Strip Ratio		1.5	1.5	2.2	2.2
<b>Capital Costs</b>					
Initial Capital	<i>\$ millions</i>	1,095	1,354	1,614	1,872
LOM Sustaining Capital	<i>\$ millions</i>	249	249	900	900
<b>Operating Costs</b>					
Mining & Delivery to Plant	<i>\$/st processed</i>	3.16	3.16	3.36	3.36
Processing	<i>\$/st processed</i>	5.32	6.94	5.36	6.34
G&A	<i>\$/st processed</i>	0.78	0.78	0.28	0.28
<b>Subtotal Operating Costs</b>	<b><i>\$/st processed</i></b>	<b>9.26</b>	<b>10.88</b>	<b>9.00</b>	<b>9.98</b>
Selling Costs	<i>\$/st processed</i>	3.23	2.55	2.94	2.34
<b>Total Operating Costs</b>	<b><i>\$/st processed</i></b>	<b>12.49</b>	<b>13.43</b>	<b>11.94</b>	<b>12.32</b>

Note: 118,000 STPD case mining and delivery costs to plant include G&A costs.

For the 59,000 STPD scenario (Phase I and II), operating cost over the LOM is estimated to be \$13.43 per ton of mineralized material processed. For the 118,000 STPD scenario (Phase I and II), operating cost over the LOM is estimated to be \$12.32 per ton of mineralized material processed. This represents a cost savings per ton processed for \$2.28 and \$3.40 for the 59,000 STPD and the 118,000 STPD scenarios, respectively, over the 32,000 STPD case.

The preliminary estimate developed for a throughput of 59,000 STPD (using total Phase I and II) amounted to an additional \$150 million dollars in initial capital over the 32,000 STPD base case (Phase I and II) and \$28 million US dollars in additional sustaining capital. Estimated financial indicators for the 59,000 STPD case improved over the 32,000 STPD throughput to \$963 million US dollars NPV@ 7% and 18.5% IRR for Phase I and II. The economic summary reflects processing 293 million tons of mineralized material grading at 0.576% Cu-Eq over a 15-year mine life, at an average of 59,000 STPD.

### 59,000 STPD Economic Highlights

	Units	Phase I		Phase I & II
		First 5 Yrs <sup>1</sup>	LOM	LOM <sup>2</sup>
Life of Mine	Yrs		15 <sup>4</sup>	15
Material Mined	Mt	294	724	724
Mill Feed Mined	Mt	106	293	293
Waste: Mill Feed Ratio		1.8	1.5	1.5
Mill Feed Grade				
Copper	%	0.313	0.290	0.290
Nickel	%	0.087	0.083	0.083
Cobalt	ppm	75	74	74
Palladium	ppm	0.293	0.264	0.264
Platinum	ppm	0.087	0.079	0.079
Gold	ppm	0.043	0.039	0.039
Annual Payable Metal Produced				
Copper	mlb	110.5	93.6	98.2
Nickel	mlb	13.2	11.3	14.5
Cobalt	mlb	0.56	0.48	0.52
Palladium	koz	90.5	71.4	99.2
Platinum	koz	19.1	14.8	24.1
Gold	koz	5.0	3.9	7.3
Copper Equivalent <sup>3</sup>	mlb	184.7	154.7	179.7
Cash Costs: by-product	\$/lb Cu	0.45	0.72	0.23
Cash Costs: Cu equivalent	\$/lb CuEq	1.56	1.71	1.59
Development Capital	\$M	1,095	1,095	1,354
Sustaining Capital	\$M	128	249	249
Annual Revenue	\$M	595	498	579
Annual EBITDA	\$M	307	234	294
NPV <sub>7</sub>	\$M		751	963
IRR	%		17.5	18.5
Payback (from first production)	Years		4.6	4.8

<sup>1</sup> Represents first five years at full concentrator production.

<sup>2</sup> Phase II production is projected to commence in Year 3 of operations.

<sup>3</sup> Cu Eq recovered payable metal, is based on prices shown in Table 1-4 of the 2018 Technical Report, mill recovery assumptions shown in Table 15-3 of the 2018 Technical Report and HydroMet Phase II recoveries shown in Table 13-14 of the 2018 Technical Report.

<sup>4</sup> The 15<sup>th</sup> year is not a full year of production.

The 118,000 STPD case (Phase I and II) improved economics over the 32,000 STPD case. The post-tax NPV@7% is approximately \$2,243 million with an IRR of 23.6% and a payback period of 4.1 years for Phase I and II, as summarized in the below table. The economic summary reflects processing 730 million tons of mineralized material grading at 0.530% Cu-Eq (recovered) over a nineteen-year life, at an average of 118,000 STPD.

### 118,000 STPD Economic Highlights

	Units	Phase I		Phase I & II
		First 5 Yrs <sup>1</sup>	LOM	LOM <sup>2</sup>
Life of Mine	Yrs	5	19 <sup>4</sup>	19 <sup>4</sup>
Material Mined	Mt	767	2,366	2,366
Mill Feed Mined	Mt	212	730	730
Waste: Mill Feed Ratio		2.6	2.2	2.2
Mill Feed Grade				
Copper	%	0.292	0.268	0.268
Nickel	%	0.084	0.076	0.076
Cobalt	ppm	74	70	70
Palladium	ppm	0.281	0.247	0.247
Platinum	ppm	0.074	0.073	0.073
Gold	ppm	0.038	0.037	0.037
Annual Payable Metal Produced				
Copper	mlb	203.5	167.8	172.4
Nickel	mlb	23.8	19.0	23.3
Cobalt	mlb	1.01	0.80	0.83
Palladium	koz	163.5	129.7	170.9
Platinum	koz	28.0	26.0	38.5
Gold	koz	7.8	7.6	11.6
Copper Equivalent <sup>3</sup>	mlb	336.9	275.6	309.5
Cash Costs: by-product	\$/lb Cu	0.56	0.85	0.39
Cash Costs: Cu equivalent	\$/lb CuEq	1.61	1.78	1.64
Development Capital	\$M	1,614	1,614	1,872
Sustaining Capital	\$M	226	900	900
Annual Revenue	\$M	1085	887	997
Annual EBITDA	\$M	542	397	488
NPV <sub>7</sub>	\$M		1737	2243
IRR	%		21.9	23.6
Payback (from first production)	Years		4.1	4.1

<sup>1</sup> Represents first five years at full concentrator production.

<sup>2</sup> Phase II production is projected to commence in Year 3 of operations.

<sup>3</sup> Cu Eq recovered payable metal, is based on prices shown in Table 1-4 of the 2018 Technical Report, mill recovery assumptions shown in Table 15-3 of the 2018 Technical Report and HydroMet Phase II recoveries shown in Table 13-14 of the 2018 Technical Report.

<sup>4</sup> The 20<sup>th</sup> year is not a full year of production.

The foregoing economic analyses of the 59,000 STPD and 118,000 STPD scenarios are of a preliminary economic assessment level, is preliminary in nature and includes mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty the preliminary economic assessment would be realized.

## Conclusions and Recommendations

M3 recommended that PolyMet should proceed with final design engineering and initiate asset preservation and demolition activities of the Erie Plant as soon as permitting allows.

Prior to construction of the NorthMet Project, PolyMet should:

- Review and update the scope of the NorthMet Project design to reflect changes resulting from the permitting process, if any, and other Project enhancements.
- Select a water treatment plant design and supply provider once the final permits are in place.
- Complete basic engineering on all designs and initiate detailed design.
- Establish construction contracts formats.
- Establish documents that will be used for all equipment purchases.
- Finalize permitting activities.

Other recommendations for further work resulting from this and the scoping-level expansion study include the potential for expansion and increasing mine mineralized material production.

The NorthMet resource base and the geometry of the deposits could allow for an increase in mineralized material tonnage. Section 24 details these resources and possible expansion and ramp-up scenarios. The following are recommendations to pursue expansion of the mine and maximize throughput and economic value.

- Commence a NI-43-101 pre-feasibility study to increase the level of accuracy of the capital and operating estimates presented in Section 24.2 of the 2018 Technical Report.
- Design general arrangement drawings of the plant area to develop more accurate material take-offs for both the maximum and ramp-up throughput capital cost estimates.
- Update the financial model based on any changes to the current capital and operating cost estimates and to reflect current metal prices. Metal prices and terms for mine planning purposes may not be reflective of the prices presented in the 2018 Technical Report at the commencement of mining.
- M3 recommends reviewing the design of the WWTS with respect to the building costs and construction schedule.
- Design an infill drilling program on inferred resources in an attempt to move inferred into the measured and indicated classification.



## 5. Risk Factors

The following are major risk factors management has identified which relate to the Company's business activities. Such risk factors could materially affect the Company's future financial results and could cause events to differ materially from those described in forward-looking statements relating to the Company. Although the following are major risk factors identified by management, they do not comprise a definitive list of all risk factors related to the Company's business and operations. Other specific risk factors are discussed elsewhere in this AIF, as well as in the Company's consolidated financial statements (under the headings "Nature of Business" and "Financial Instruments and Risk Management" and elsewhere within that document) and in management's discussion and analysis (under the headings "Financial Instruments and Risk Management" and "Risk and Uncertainties" and elsewhere within that document) for the year ended December 31, 2019, and its other disclosure documents, all as filed on SEDAR and EDGAR.

### **The Company is dependent on a single mineral project.**

The NorthMet Project accounts for all of the mineral resources and mineral reserves and exclusively represents the current potential for the future generation of revenue. Mineral exploration and development involves a high degree of risk that even a combination of careful evaluation, experience and knowledge cannot eliminate, and few properties that are explored are ultimately developed into producing mines. Any adverse development affecting the NorthMet Project may have a material adverse effect on PolyMet's business, prospects, financial position, results of operations and cash flows.

### **The Company may experience delays, higher than expected costs, difficulties in obtaining and maintaining environmental permits and other obstacles when implementing current and future development plans and opportunities.**

PolyMet is investing heavily in various facets of the NorthMet Project, which is subject to a number of risks that may make it less successful than anticipated, including:

- legal challenges to permits received;
- delays or higher than expected costs in obtaining the necessary equipment or services to build and operate the Project; and
- adverse mining conditions may delay or restrict production of expected quantities of minerals.

### **Future activities could be subject to environmental laws and regulations, which may have a materially adverse effect on future operations, in which case operations could be suspended or terminated.**

PolyMet, like other companies doing business in Canada and the United States, is subject to a variety of federal, provincial, state and local statutes, rules and regulations designed to, among other things:

- protect the environment, including the quality of the air and water in the vicinity of exploration, development and mining operations;
- remediate the environmental impacts of those exploration, development, and mining operations;
- protect and preserve wetlands and endangered species; and
- mitigate negative impacts on certain archaeological and cultural sites.

Compliance with statutory environmental quality requirements described above may require significant capital outlays, impacting earnings power, or causing material changes to intended activities. Environmental standards imposed by federal, state, or local governments may be changed or become more stringent in the future, which could materially and adversely affect proposed activities.

Moreover, governmental authorities and private parties may bring lawsuits based upon damage to property and injury to persons resulting from the environmental, health and safety impacts of prior and current operations. These lawsuits could lead to the imposition of substantial fines, remediation costs, penalties and other civil and criminal sanctions. Substantial costs and liabilities, including for restoring the environment after the closure of mines, are inherent in the Company's operations. PolyMet cannot assure

that any such law, regulation, enforcement or private claim would not have a material adverse effect on its financial condition, results of operations or cash flows.

**Land reclamation requirements for the NorthMet Project may be burdensome.**

Land reclamation requirements are generally imposed on mineral exploration companies (as well as companies with mining operations) in order to minimize long-term effects of land disturbance. In order to carry out reclamation obligations imposed on the Company in connection with exploration, development and production activities, financial resources must be allocated that might otherwise be spent on further exploration and development programs. In addition, regulatory changes could increase obligations to perform reclamation and mine closing activities. If required to carry out unanticipated reclamation work, the Company's financial position could be adversely affected.

**PolyMet is subject to significant governmental regulations and related costs and delays may negatively affect business.**

Mining activities are subject to extensive federal, state, local and foreign laws and regulations governing environmental protection, natural resources, prospecting, development, production, post-closure reclamation, taxes, labor standards and occupational health and safety laws and regulations, including mine safety, toxic substances and other matters. The costs associated with compliance with such laws and regulations are substantial. Possible future laws and regulations, or more restrictive interpretations of current laws and regulations by governmental authorities, could cause additional expense, capital expenditures, restrictions on or suspensions of operations and delays in the development of new properties.

Various governmental permits are required to conduct exploration, development, construction and mining activities. Obtaining the necessary governmental permits is often a complex and time-consuming process involving numerous United States or Canadian federal, provincial, state, and local agencies. The duration and success of each permitting effort is contingent upon many variables not within the Company's control. In the context of obtaining permits or approvals, PolyMet must comply with known standards, existing laws, and regulations that may entail greater or lesser costs and delays depending on the nature of the activity to be permitted and the interpretation of the laws and regulations implemented by the permitting authority. The failure to obtain certain permits or adoption of more stringent permitting requirements could have a material adverse effect on business, operations, and properties and the Company may be unable to proceed with current or future exploration and development programs.

Federal legislation and implementing regulations adopted and administered by the United States Environmental Protection Agency, Army Corp of Engineers, Forest Service, Fish and Wildlife Service, Mine Safety and Health Administration, and other federal agencies, and legislation such as the Federal Clean Water Act, Clean Air Act, National Environmental Policy Act, Endangered Species Act, and Comprehensive Environmental Response, Compensation, and Liability Act, have a direct bearing on exploration, development and mining operations United States. Due to the uncertainties inherent in the permitting process, the Company cannot be certain that it will be able to obtain required approvals for current or future proposed activities in a timely manner, or that PolyMet's current or future proposed activities will be allowed at all.

Failure to comply with applicable laws, regulations and permitting requirements may result in enforcement actions, including orders issued by regulatory or judicial authorities causing operations to cease or be curtailed, which may require corrective measures including capital expenditures, installation of additional equipment or remedial actions. Parties engaged in mining operations or in the exploration or development of mineral properties may be required to compensate those suffering loss or damage by reason of the mining activities and may be subject to civil or criminal fines or penalties imposed for violations of applicable laws or regulations. Any such penalties, fines, sanctions or shutdowns could have a material adverse effect on business and results of operations.

**PolyMet may be subject to future litigation and regulatory proceedings which may have an adverse effect on business operations.**

PolyMet may be subject to civil claims (including class action claims) based on allegations of negligence, breach of statutory duty, public nuisance or private nuisance or otherwise in connection with its operations or investigations relating thereto. While the Company is presently unable to quantify its potential liability under any of the above, such liability may have a material adverse effect on its ability to continue in operation.

In addition, the Company may be subject to actions or related investigations by governmental or regulatory authorities. Such actions may include civil or criminal prosecution for breach of relevant statutes, regulations or rules or failure to comply with the terms of licenses and permits and may result in liability for pollution, other fines or penalties, revocation of consents, permits, approvals or licenses or similar action, which could be material and may affect the results of operations. Exposures to fines and penalties generally are uninsurable as a matter of public policy.

**Because the price of metals fluctuate, if the prices of metals in PolyMet's ore body decrease below a specified level, it may no longer be profitable to develop the NorthMet Project for those metals and PolyMet could cease operations.**

Prices of metals are determined by some of the following factors:

- global and regional supply and demand;
- political and economic conditions and production costs in major metal producing regions;
- the strength of the United States dollar; and
- expectations for inflation.

The aggregate effect of these factors on metals prices is impossible to predict. In addition, the prices of metals are sometimes subject to rapid short-term and/or prolonged changes because of speculative activities. The current demand for and supply of various metals affect the prices of copper, nickel, cobalt, platinum, palladium and gold, but not necessarily in the same manner as current supply and demand affect the prices of other commodities. If the prices of PolyMet's primary products, namely copper, nickel and palladium are below foreseeable costs of production for a substantial period operations could cease.

**PolyMet is dependent on its key personnel.**

Company success depends on key members of management. The loss of the services of one or more of such key management personnel could have a material adverse effect on the Company. PolyMet's ability to manage exploration and development activities, and hence success, will depend in large part on the efforts of these individuals. PolyMet faces intense competition for qualified personnel and cannot be certain that it will be able to attract and retain such personnel.

In addition, if the NorthMet Project goes into production, PolyMet will experience significant growth in operations. This growth is expected to create new positions and responsibilities for management and technical personnel and will increase demands on operating and financial systems. There can be no assurance that PolyMet will successfully meet these demands and effectively attract and retain additional qualified personnel to manage anticipated growth. The failure to attract such qualified personnel would have a material adverse effect on business, financial position, results of operations and cash flows.

**PolyMet's metals exploration and development efforts are highly speculative in nature and may be unsuccessful.**

As a development stage company, work is speculative and involves unique and greater risks than are generally associated with other businesses.

The development of mineral deposits involves uncertainties, which careful evaluation, experience, and knowledge cannot eliminate. Few properties explored are ultimately developed into producing mines. It is

impossible to ensure that the current development program the Company has planned will result in a profitable commercial mining operation.

**PolyMet is subject to all the risks inherent to the mining industry, which may have an adverse affect on business operations.**

PolyMet is subject to all of the risks inherent in the mining industry, including, without limitation, the following:

- Success in discovering and developing commercially viable quantities of minerals is the result of a number of factors, including the quality of management, the interpretation of geological data, the level of geological and technical expertise and the quality of land available for exploration;
- Operations are subject to a variety of existing laws and regulations relating to exploration and development, permitting procedures, safety precautions, property reclamation, employee health and safety, air and water quality standards, pollution and other environmental protection controls, all of which are subject to change and are becoming more stringent and costly to comply with;
- A large number of factors beyond PolyMet's control, including fluctuations in metal prices and production costs, inflation, the proximity and liquidity of precious metals and energy fuels markets and processing equipment, government regulations, including regulations relating to prices, taxes, royalties, land tenure, land use, importing and exporting of minerals and environmental protection, and other economic conditions, will affect the economic feasibility of mining;
- Substantial expenditures are required to construct mining and processing facilities;
- Title to mining properties may be subject to other claims; and
- In the development stage of a mining operation, mining activities could be subject to substantial operating risks and hazards, including metal bullion losses, environmental hazards, industrial accidents, labor disputes, encountering unusual or unexpected geologic formations or other geological or grade problems, encountering unanticipated ground or water conditions, cave-ins, pit-wall failures, flooding, rock falls, periodic interruptions due to inclement weather conditions or other unfavorable operating conditions and other acts of God. Some of these risks and hazards are not insurable or may be subject to exclusion or limitation in any coverage, which the Company obtains or may not be insured due to economic considerations.

**Actual mineral reserves and mineral resources may not conform to the Company's established estimates.**

The figures for mineral reserves and mineral resources stated in this AIF are estimates and no assurances can be given that the anticipated tonnages and grades will be achieved or that the indicated level of recovery will be realized. Market fluctuations and the prices of metals may render reserves and mineral resources uneconomic. Moreover, short-term operating factors relating to the mineral deposits, such as the need for the orderly development of the deposits or the processing of new or different grades of ore, may cause a mining operation to be unprofitable in any particular accounting period.

The estimating of mineral reserves and mineral resources is a subjective process that relies on the judgment of the persons preparing the estimates. Estimates of mineral resources are, to a large extent, based on the interpretation of geological data obtained from drill holes and other sampling techniques. This information is used to calculate estimates of the configuration of the mineral resource, expected recovery rates, anticipated environmental conditions and other factors. As a result, mineral resource estimates for the NorthMet Project may require adjustments or downward revisions based upon further exploration or development work or upon actual production experience, thereby adversely impacting the economics of the NorthMet Project. Any material reductions in estimates of mineralization or the ability to extract this mineralization, could have a material adverse effect on the results of operations or financial condition.

**There is no assurance that any of PolyMet's mineral resources, not currently classified as mineral reserves, will ever be classified as mineral reserves under the disclosure standards of the SEC.**

Item 4 of this AIF discusses mineral resources in accordance with NI 43-101. Resources are classified as "measured resources", "indicated resources" and "inferred resources" under NI 43-101. However, U.S. investors are cautioned that the SEC does not recognize these resource classifications. There is no assurance that any of the Company's mineral resources, not currently classified as mineral reserves, will be converted into mineral reserves under the disclosure standards of the SEC.

**The Company has had no production history and does not know if it will generate revenues in the future.**

While the Company was incorporated in 1981, it has no history of producing minerals. The Company has not developed or operated any mines and has no operating history upon which an evaluation of future success or failure can be made. The ability to achieve and maintain profitable mining operations is dependent upon a number of factors, including the ability to successfully build and operate mines, processing plants and related infrastructure. PolyMet may not successfully establish mining operations or profitably produce metals at any of its properties.

**PolyMet has a history of losses, which it expects will continue for the future. If the Company does not begin to generate revenues, it may either have to suspend or cease operations.**

As a development stage company with negative cash flows and no holdings in any producing mines, PolyMet continues to incur losses and expects to incur losses in the immediate future. As at December 31, 2019, the Company had an accumulated deficit of \$207 million. PolyMet may not be able to achieve or sustain profitability in the future. If the Company does not begin to generate revenues, it may either have to suspend or cease operations.

While in the past the Company has been successful in closing financing agreements, there can be no assurance it will be able to do so again. Factors that could affect the availability of financing include the state of debt and equity markets, investor perceptions and expectations, and the metals markets.

**The Company has incurred significant indebtedness and there is no guarantee that the Company will be able to repay or refinance such indebtedness.**

There is no assurance that any indebtedness of the Company will be extended, repaid, refinanced or restructured, or that additional financing on commercially reasonable terms will be available. Failure to repay indebtedness and satisfy the conditions of such indebtedness could ultimately result in loss of substantially all of the Company's assets. In addition, repayment of such indebtedness could require the issuance by the Company of a significant number of common shares and thereby result in dilution to existing shareholders of the Company.

Repayment of the indebtedness may adversely affect future cash flow, which may adversely affect the ability to operate effectively and, therefore, require the Corporation to refinance or restructure the consolidated indebtedness.

**The Company may not be able to raise the funds necessary to develop the NorthMet Project. If PolyMet is unable to raise such additional funds, the Company may have to suspend or cease operations.**

PolyMet will need to seek additional financing to complete the development and construction of the NorthMet Project, in addition to the funding required to repay its current indebtedness. Sources of such external financing may include future equity and debt offerings, advance payments by potential customers to secure long-term supply contracts, grants and low-cost debt from certain state financial institutions, and commercial debt secured by the NorthMet Project. There is no guarantee that any such financing will be available to the Company. If the Company cannot raise the money necessary to continue to explore, develop and construct the NorthMet Project, it may have to suspend or cease operations.

**The Company may not have adequate, if any, insurance coverage for some business risks that could lead to economically harmful consequences to PolyMet.**

The Company's business is generally subject to a number of risks and hazards, including:

- industrial accidents;
- railroad accidents;
- labor disputes;
- environmental hazards;
- electricity stoppages;
- equipment failures; and
- severe weather and other natural phenomena.

These occurrences could result in damage to, or destruction of, mineral properties, production facilities, transportation facilities, or equipment. They could also result in personal injury or death, environmental damage, waste of resources or intermediate products, delays or interruption in mining, production or transportation activities, monetary losses and possible legal liability. The insurance the Company maintains against risks that are typical in the business may not provide adequate coverage. Insurance against some risks may not be available at a reasonable cost or at all. As a result, accidents or other negative developments involving mining, production or transportation facilities could have a material adverse effect on operations.

**The mining industry is an intensely competitive industry and the Company may have difficulty effectively competing with other mining companies in the future.**

The Company faces intense competition from other mining and producing companies. In recent years, the mining industry has experienced significant consolidation amongst competitors. PolyMet cannot assure that the result of current or further consolidation in the industry will not adversely affect the Company.

In addition, because mines have limited lives, PolyMet must periodically seek to replace and expand its reserves through additional exploration or by acquiring new properties. Significant competition exists to acquire properties producing, or capable of producing, copper, nickel and other metals.

If PolyMet is unable to successfully manage these risks, its growth prospects and profitability may suffer.

**The Company is dependent on information technology and its systems and infrastructure face certain risks, including cyber security risks and data leakage risks.**

PolyMet utilizes a variety of information technology systems and infrastructure. Any significant breakdown, invasion, destruction or interruption of these systems by employees, others with authorized access to the systems, or unauthorized persons could negatively impact operations. There is also a risk that the Company could experience a business interruption, theft of information, or reputational damage as a result of a cyber-attack, such as a data leakage of confidential information either internally or by third-party providers. While the Company has invested in the protection of its data and information technology to reduce these risks and periodically test the security of its information systems network, there can be no assurance that these efforts will prevent breakdowns or breaches in systems that could adversely affect the business.

**PolyMet may be subject to risks relating to the global economy.**

Market events and conditions in recent years, including disruptions in the international credit markets and other financial systems and the deterioration of global economic conditions could impede the Company's access to capital or increase the cost of capital. These disruptions in the credit and financial markets have had a significant material adverse impact on a number of financial institutions and have limited access to capital and credit for many companies. These disruptions could, among other things, make it more difficult for the Company to obtain, or increase its cost of obtaining capital and financing for operations.

**The Company may be impacted by climate change, natural or other disasters.**

The Company's financial and/or operating performance could be adversely affected by climate change and the impact of natural or other disasters, such as earthquakes, fires, floods, epidemics or pandemics. This is due to volatility and disruption to global supply chains, operations, mobility of people and the financial markets, which could affect interest rates, credit ratings, credit risk, inflation, business, financial conditions and other factors relevant to the Company.

Global climate change could exacerbate certain of the threats facing PolyMet's business, including the frequency and severity of weather-related events, resource shortages, changes in rainfall and storm patterns and intensities, water shortages, rising water levels and changing temperatures which can disrupt the operations, damage infrastructure or properties, create financial risk or otherwise have a material adverse effect on financial position or liquidity. These threats may result in substantial costs to respond during the event, to recover from the event and possibly to modify existing or future infrastructure requirements to prevent recurrence. Global climate change also results in regulatory risks, which creates economic and regulatory uncertainty.

In the course of exploration, development and production of mineral properties, certain risks, and in particular, unexpected or unusual geological operating conditions including rock bursts, cave-ins, fires, flooding and earthquakes may occur. It is not always possible to fully insure against such risks, and PolyMet may decide not to insure such risks as a result of high premiums or other reasons. Should such liabilities arise, they could reduce or eliminate any future profitability and result in increasing costs and a decline in the value of the common shares.

**The Company may be impacted by global health crises such as the COVID-19 pandemic.**

PolyMet's business, operations and financial condition could be materially adversely affected by the outbreak of epidemics or pandemics or other health crises. For example, in late December 2019, a novel coronavirus (COVID-19) was identified originating in China, subsequently spread worldwide and on March 11, 2020, the World Health Organization declared it was a pandemic. The risks of public health crises such as the COVID-19 pandemic to our business include without limitation, the ability to raise funds, employee health, workforce productivity, increased insurance premiums, limitations on travel, the availability of industry experts and personnel, potential breaches of material contracts, disruption of the Company's supply chains and other factors that will depend on future developments beyond the Company's control. In particular, the continued spread of the coronavirus globally, prolonged restrictive measures put in place to help control the outbreak of COVID-19 or other adverse public health developments could materially and adversely impact the Company's business and the exploration and development of the NorthMet Project could materially slow down or the Company could be required to suspend its development for an indeterminate period. There can be no assurance that the Company's personnel will not ultimately see its workforce productivity reduced or that the Company will not incur increased medical costs or insurance premiums as a result of these health risks.

In addition, the COVID-19 pandemic or the fear thereof could adversely affect global economies and financial markets resulting in volatility or an economic downturn that could have an adverse effect on the demand for metal and our future prospects. Epidemics such as COVID-19 could have a material adverse impact on capital markets and the Company's ability to raise sufficient funds to finance the ongoing development of its material business. All of these factors could have a material and adverse effect on our business, financial condition and results of operations.

The extent to which COVID-19 impacts the Company's business, including the market for its securities, the ability to raise capital and valuation of non-financial assets including mineral property, plant and equipment and intangibles, will depend on future developments, which are highly uncertain and cannot be predicted at this time, and include the duration, severity and scope of the outbreak and the actions taken to contain or treat the coronavirus outbreak.

It is not always possible to fully insure against such risks, and PolyMet may decide not to insure such risks as a result of high premiums or other reasons. Should such liabilities arise, they could reduce or eliminate any future profitability and result in increasing costs and a decline in the value of the common shares.

## **RISKS RELATED TO THE OWNERSHIP OF POLYMET COMMON SHARES**

### **PolyMet may experience volatility in its share price.**

PolyMet's common shares are listed for trading on the TSX and on the NYSE American. Shareholders may be unable to sell significant quantities of the common shares into the public trading markets without a significant reduction in the price of the Company's shares, if at all. The market price of the common shares may be affected significantly by factors such as changes in operating results, the availability of funds, fluctuations in the price of metals, the interest of investors, traders and others in development stage public companies such as PolyMet and general market conditions. In recent years, the securities markets have experienced a high level of price and volume volatility, and the market price of securities of many companies, particularly development companies similar to PolyMet, have experienced wide fluctuations, which have not necessarily been related to the operating performances, underlying asset values, or the future prospects of such companies. There can be no assurance that future fluctuations in the price of PolyMet's shares will not occur.

### **A large number of shares will be eligible for future sale and may depress PolyMet's share price.**

Shares that are eligible for future sale may have an adverse effect on the price of the Company's common shares. As at December 31, 2019 there were 1,005,230,259 common shares outstanding. The average trading volume for the three months prior to December 31, 2019 was approximately 20,000 shares per day on the TSX and 366,000 shares per day on the NYSE American. Sales of substantial amounts of the Company's common shares, or a perception that such sales could occur, and the existence of options or warrants to purchase common shares and debt convertible into common shares at prices that may be below the then current market price of the common shares, could adversely affect the market price of common shares and could impair the Company's ability to raise capital through the sale of equity securities.

### **Ownership interest, voting power and the market price of common shares may decrease because the Company has issued, and may continue to issue, a substantial number of securities convertible or exercisable into common shares.**

PolyMet has issued common shares, options, restricted shares, restricted share units, convertible debt and warrants to purchase its common shares to satisfy its obligations and fund operations. Since the Company currently does not have a source of revenue, it will likely issue additional common shares, or other securities exercisable for or convertible into common shares to raise money for continued operations or as non-cash incentives to the Company's directors, officers, and key employees. If conversions of securities exercisable into common shares or additional sales of equity occur, ownership interest and voting power in PolyMet will be diluted and the market price of common shares may decrease.

Under the Company's 2007 Omnibus Share Compensation Plan, as amended and restated ("Omnibus Plan"), the aggregate number of share options, restricted shares, restricted share units, and other share-based awards is restricted to 10% of the issued and outstanding common shares on the grant date, excluding 2,500,000 common shares pursuant to an exemption approved by the Toronto Stock Exchange.

### **Because PolyMet believes that it will be classified as a passive foreign investment company, or "PFIC", United States holders of common shares may be subject to United States federal income tax consequences that are worse than those that would apply if PolyMet were not a PFIC.**

Because PolyMet believes that it will be classified as a PFIC, United States holders of common shares may be subject to United States federal income tax consequences that are worse than those that would apply if the Company were not a PFIC, such as ordinary income treatment plus a charge in lieu of interest upon a sale or disposition of common shares even if the shares were held as a capital asset.

### **If we are unable to maintain the listing standards of the NYSE American, our common shares may be delisted, which may have a material adverse effect on the liquidity and value of our common shares.**



Our common shares are traded on the NYSE American. To maintain our listing on the NYSE American, we must meet certain financial and liquidity criteria. The market price of our common shares have been and may continue to be subject to significant fluctuation. If we fail to meet any of the NYSE American's listing standards, we may be delisted. In the event of delisting, trading of our common shares would most likely be conducted in the over the counter market on an electronic bulletin board established for unlisted securities, which could have a material adverse effect on the market liquidity and value of our common shares.

## 6. Dividends

Since its incorporation, PolyMet has not declared or paid, and has no present intention to declare or to pay, any cash dividends with respect to its common shares. Earnings will be retained to finance further growth and development of the business. However, if the board of directors were to declare a dividend, all common shares would participate equally.

## 7. Capital Structure

The Company's authorized capital consists of an unlimited number of common shares, without par value of which 1,005,230,259 common shares were issued and outstanding as fully paid and non-assessable as of December 31, 2019.

Shareholders are entitled to one vote per common share at all meetings of Shareholders except meetings at which only holders of another specified class or series of shares of the Company are entitled to vote separately as a class or series. The holders of common shares are entitled to receive dividends as and when declared by the Board, and to receive a pro rata share of the remaining property and assets of the Company in the event of liquidation, dissolution or winding up of the Company. The common shares carry no pre-emptive, redemption, purchase or conversion rights. Pursuant to the terms of prior financings, Glencore has certain anti-dilution rights that permit it to acquire additional securities so as to maintain its proportional equity interest in the Company. Neither the *Business Corporations Act* (British Columbia) ("BCBCA") nor the constating documents of the Company impose restrictions on the transfer of common shares on the register of the Company, provided that the Company receives the certificate representing the common shares to be transferred together with a duly endorsed instrument of transfer and payment of any fees and taxes which may be prescribed by the Board from time to time. There are no sinking fund provisions in relation to the common shares and they are not liable to further calls or to assessment by the Company. The BCBCA provides that the rights and provisions attached to any class of shares may not be modified, amended or varied unless consented to by special resolution passed by a majority of not less than two-thirds of the votes cast in person or by proxy holders of the common shares.

## 8. Market for Securities

PolyMet's common shares are listed and posted for trading on the TSX under the symbol "POM", and on the NYSE American under the symbol "PLM". The following table sets forth the market price range and trading volumes of the Company's common shares on each of the TSX and NYSE American for the periods indicated.

Month	TSX			NYSE American		
	High (C\$)	Low (C\$)	Volume	High (US\$)	Low (US\$)	Volume
January 2019	1.13	0.98	104,200	0.83	0.74	6,409,000
February 2019	0.98	0.87	178,453	0.75	0.67	5,764,600
March 2019	1.04	0.86	345,837	0.78	0.65	21,107,400
April 2019	0.85	0.65	756,344	0.65	0.49	20,432,700
May 2019	0.72	0.56	731,635	0.53	0.41	10,463,700
June 2019	0.56	0.50	581,579	0.43	0.37	9,662,400
July 2019	0.66	0.485	394,477	0.50	0.38	9,624,300
August 2019	0.50	0.44	410,194	0.38	0.34	6,676,900
September 2019	0.49	0.425	204,253	0.37	0.32	4,664,700
October 2019	0.46	0.38	345,550	0.35	0.29	6,612,800
November 2019	0.44	0.39	118,437	0.34	0.30	4,891,700
December 2019	0.42	0.30	764,706	0.31	0.23	12,328,500

## 9. Securities Not Listed or Quoted

The only classes of securities of the Company that are not listed or quoted on a marketplace are stock options, restricted shares units and share purchase warrants.

The following stock options were issued during the year ended December 31, 2019:

Date of Issuance	Number of Stock Options Issued	Exercise Price (US\$)
January 7, 2019	3,625,000	0.81

Effective June 28, 2019, the Company reduced the exercise price of all options that were outstanding prior to the Rights Offering, to reflect the dilutive effect of the common shares that were issued in connection with the Rights Offering. The adjustment did not impact the financial statements.

The following restricted shares units were issued during the year ended December 31, 2019:

Date of Issuance	Number of Restricted Share Units Issued	Exercise Price (US\$)
January 4, 2019	292,688	N/A
January 7, 2019	1,339,431	N/A
November 11, 2019	93,750	N/A

Effective June 28, 2019, the Company increased the number of common shares issuable for all restricted share units outstanding prior to the Rights Offering by 624,452 common shares, to reflect the dilutive effect of the common shares that were issued in connection with the Rights Offering. The adjustment did not impact the financial statements.

The following share purchase warrants were issued during the year ended December 31, 2019:

Date of Issuance	Number of Restricted Share Units Issued	Exercise Price (US\$)
March 22, 2019	6,458,001	\$0.74

Effective June 28, 2019, the Company increased the number of common shares issuable and reduced the exercise price of all warrants that were outstanding prior to the Rights Offering subject to stock exchange approval, to reflect the dilutive effect of the common shares that were issued in connection with the Rights Offering. The adjustment did not impact the financial statements

As at December 31, 2019, the Company had the following outstanding securities held in escrow:

Designation of Class	Number of Securities held in Escrow	Percentage of Class
Common shares <sup>(1)</sup>	95,500	0.01%

<sup>1</sup> Common shares are held by Farris, Vaughan, Wills & Murphy LLP and were issued as restricted shares to certain United States employees. Contractual restrictions on transfer ends commencement of commercial production.

## 10. Directors and Officers

### Name, Occupation and Security Holding

The name, province or state, country of residence, position or office held with the Company and principal occupation during the past five years of each director and executive officer of the Company as at the date of this AIF are described as follows:

Name & Residence	Position(s) with the Company	Principal Occupation during past five years	Director since
Jonathan Cherry <sup>(4,5)</sup> Minnesota, United States	Director, President & Chief Executive Officer	Same	July 16, 2012
David Dreisinger <sup>(2,3,4,5)</sup> British Columbia, Canada	Director	Professor and Chairholder of the Industrial Research and Chair in Hydrometallurgy, University British Columbia	October 3, 2003
W. Ian L. Forrest <sup>(1,2,3)</sup> Vaud, Switzerland	Director, Chairman	Chartered Accountant	October 3, 2003
Hilmar Rode Zug, Switzerland	Director	Executive, Glencore	February 28, 2020
Helen Harper <sup>(2,3,4,5)</sup> Ontario, Canada	Director	Asset Manager for North America Copper Operations, Glencore	July 13, 2016
Alan R. Hodnik <sup>(1,4)</sup> Minnesota, United States	Director	Chairman, President and Chief Executive Officer, Allele Inc.	March 9, 2011
Stephen Rowland <sup>(1,3)</sup> Connecticut, United States	Director	Executive, Glencore	October 30, 2008
Michael M. Sill <sup>(2, 3)</sup> Minnesota, United States	Director	Chief Executive Officer, Road Machinery & Supplies Co.	March 9, 2011
Patrick Keenan Minnesota, United States	Chief Financial Officer	Same, and previously Senior Vice President - Finance, Newmont Mining Corporation, and previously Chief Financial Officer, Rio Tinto Energy	N/A
Bradley Moore Minnesota, United States	Executive Vice President, Environmental & Governmental Affairs	Same	N/A

<sup>1</sup> Member of the Compensation Committee.

<sup>2</sup> Member of the Audit Committee. Helen Harper is a non-voting participant.

<sup>3</sup> Member of the Nominating and Corporate Governance Committee.

<sup>4</sup> Member of the Health, Safety, Environment and Communities Committee.

<sup>5</sup> Member of the Technical Steering Committee.

As at the date of this AIF, PolyMet's directors and executive officers, as a group, beneficially owned, directly or indirectly, or exercised control or direction over 5,837,860 common shares, representing less than 1% of the total number of common shares outstanding before giving effect to the exercise of options or warrants to purchase common shares held by such directors and executive officers. The statement as to the number of common shares beneficially owned, directly or indirectly, or over which control or direction is exercised by the Company's directors and executive officers as a group is based upon information furnished by the directors and executive officers.

Each Director serves until the next annual general meeting of shareholders or until his/her successor is duly elected, unless his/her office is vacated in accordance with the Articles of Incorporation. Vacancies on the Board of Directors are filled by election from nominees chosen by the remaining Directors and the persons filling those vacancies will hold office until the next annual general meeting of shareholders, at which time they may be re-elected or replaced.

## **Indebtedness**

No director or executive officer, nor any of their respective associates or affiliates is or has been at any time since the beginning of the last completed fiscal year indebted to PolyMet.

## **Cease Trade Orders, Bankruptcies, Penalties or Sanctions**

To the knowledge of PolyMet's management and as of the date of this AIF, except for Mr. Forrest's directorships as noted below, no directors: (i) are, at the date hereof, or have been, during the 10 years prior to the date hereof, a director or executive officer of any company that, while that person was acting in that capacity or within a year of that person ceasing to act in that capacity became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or became subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver-manager or trustee appointed to hold assets of the director; or (ii) have, within the 10 years before the date hereof, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or become subject to or instituted any proceedings, arrangements or compromises with creditors, or had a receiver, receiver manager or trustee appointed to hold assets of the director. Georex SA, an oil services company of which Mr. Forrest was a director, filed for administration in France in June 2017 on account of its business model no longer being sustainable. Poros SAS, an associated company of Georex SA of which Mr. Forrest was also a director, has ceased to be active in March 2016 since France banned oil shale fracking.

## **Conflicts of Interest**

Directors and officers may become in a position of conflict. Directors and officers must disclose the nature and extent of the conflict and abstain from voting on the approval of the proposed contract or transaction, unless all of the directors have a disclosable interest, in which case the director may vote on such resolution and may be liable to account to the Company for any profit that accrued under such transaction. To the knowledge of PolyMet's management and as of the date of this AIF, there are no known existing conflicts of interest between the Company and any of PolyMet's directors or officers as a result of such individual's outside business interests.

## **11. Legal Proceedings and Regulatory Actions**

To the knowledge of Company's management, there are no material legal proceedings or regulatory actions outstanding to which PolyMet is a party, or to which any of its property is subject to and no such proceedings or regulatory actions are known to the Company to be threatened or pending, as of the date hereof, with the exception of challenges to regulatory permit and approval decisions by the MDNR, MPCA, and USFS as discussed in Item 3 above.

## **12. Interest of Management and Others in Material Transactions**

Other than as disclosed in this AIF, PolyMet is not aware of any material interest, direct or indirect, involving any director or executive officer or any shareholder who holds more than 10% of the outstanding voting securities, or any associate or affiliate of any of the foregoing, which has been entered into since the commencement of the last completed fiscal year or in any proposed transaction which, in either case, has materially affected or will materially affect PolyMet or any of PolyMet's subsidiaries.

### **13. Transfer Agent and Registrar**

The Company's registrar and transfer agent is Computershare Investor Services Inc. located at 100 University Avenue, 9th Floor, Toronto, Ontario M5J 2Y1, Canada.

### **14. Material Contracts**

The following is a summary of each material contract to which the Company is a party, other than contracts entered into in the ordinary course of business, for the last fiscal year or before the last fiscal year that is still in effect.

- Acquisition of the mineral rights, see Item 4 for additional information;
- Acquisition of the Erie Plant and associated infrastructure acquired in the Asset Purchase Agreements I and II, see Item 4 for additional information; and
- Financing agreements entered into with Glencore, see Items 3 and 4 for additional information.

### **15. Interest of Experts**

Deloitte & Touche LLP has served as PolyMet's auditor since August 2019 and is located at 50 South 6<sup>th</sup> Street, Suite 2800, Minneapolis, Minnesota, USA 55402. Deloitte & Touche LLP report that they are independent of the Company in accordance with the code of professional conduct of the Certified Professional Accountants of Minnesota and the rules of the Public Company Accounting Oversight Board and the Securities and Exchange Commission.

PricewaterhouseCoopers LLP served as PolyMet's auditor from April 2006 until June 2019 and is located at 250 Howe Street, Suite 1400, Vancouver, British Columbia, Canada V6C 3S7. PricewaterhouseCoopers LLP report that while they were the Company's auditor they were independent of the Company in accordance with the code of professional conduct of the Chartered Professional Accountants of British Columbia and the rules of the Public Company Accounting Oversight Board and the Securities and Exchange Commission.

PolyMet has relied on the work of the qualified persons listed in the section of this AIF titled "Introductory Notes - Qualified Persons Under NI 43-101" in connection with the scientific and technical information presented in this AIF in respect of its mineral property, NorthMet, which is based upon the NI 43-101 Technical Report filed on SEDAR and EDGAR.

None of the qualified persons listed in the section of this AIF titled "Introductory Notes - Qualified Persons Under NI 43-101", nor any of the companies listed therein that employ those individuals, received or has received a direct or indirect interest in the property of the Company or of any associate or affiliate of the Company in connection with the preparation of reports relating to the Company's mineral properties. As of the date hereof, the aforementioned persons and companies beneficially own, directly or indirectly, less than 1% of the Company's outstanding securities of any class and less than 1% of the outstanding securities of any class of PolyMet's associates or affiliates.

## 16. Audit Committee

PolyMet is subject to National Instrument 52-110 - *Audit Committees*, which has been adopted in various Canadian provinces and territories and which prescribes certain requirements in relation to audit committees and defines the meaning of independence with respect to directors. These reflect current regulatory guidelines of the CSA as well as certain U.S. initiatives under the *Sarbanes-Oxley Act of 2002* and adopted corporate governance rules of the NYSE American. A copy of the Company's Audit Committee's charter is attached as Schedule A to this AIF.

During 2019, the Audit Committee was composed of Michael M. Sill, Dr. David Dreisinger, and W. Ian L. Forrest, each of whom, in the opinion of the Board of Directors, is independent as determined under the rules of the TSX and NYSE American and each of whom is financially literate. The Audit Committee meets the composition requirements set forth by TSX and NYSE American rules.

Michael M. Sill has served as a member of PolyMet's board of directors since March 2011. He serves as the Chair on the Audit committee and also serves on the Nominating and Corporate Governance committee. Since 1994, Mr. Sill has served as President and CEO of Road Machinery & Supplies Co., a distributor of construction, mining and forestry equipment. Educated at Dartmouth College and J.L. Kellogg Graduate School of Management, Mr. Sill started his career as a financial analyst and commercial lending officer with The Northern Trust Company. He serves on the board of Reviva Corporation and Dunwoody College of Technology, and has previously served on the Twin Cities Regional Board of US Bank and numerous industry association boards.

Dr. David Dreisinger has served as a member of PolyMet's board of directors since October 2003. He serves as the Chair of the Technical Steering committee and also serves on the Health, Safety, Environment and Communities, Audit, and on the Nominating and Corporate Governance committees. Since 1988, Dr. Dreisinger has been a member of the faculty at the University of British Columbia in the Department of Materials Engineering and is currently Professor and Chairholder of the Industrial Research and Chair in Hydrometallurgy. He has published over 300 papers and has been extensively involved as a process consultant in industrial research programs with metallurgical companies. Dr. Dreisinger has participated in 21 U.S. patents for work in areas such as pressure leaching, ion exchange removal of impurities from process solutions, use of thiosulfate as an alternative to cyanide in gold leaching, and leach-electrolysis treatment of copper recovery from sulfide ores, and the Sepon Copper Process for copper recovery from sulfidic-clayey ores. Dr. Dreisinger serves as a director of Euro Manganese Inc., Search Minerals, Inc. and LeadFX Inc., and as Vice President – Metallurgy for each of Camrova Resources, Inc., and Search Minerals Inc.

W. Ian L. Forrest has served as a member of PolyMet's board of directors since October 2003 and as its Chairman since July 2012. Mr. Forrest previously served as Chairman of the board from May 2004 to February 2008 and Co-Chairman from January 2011 to July 2012. He serves as the Chair on the Nominating and Corporate Governance committees and also serves on the Audit and Compensation committees. Mr. Forrest played an important role in the Company's revival in 2003. Mr. Forrest is a member of the Institute of Chartered Accountants of Scotland. Mr. Forrest has more than 40 years of experience with public companies in the resource sector. His experience encompasses the areas of promotion, financing, exploration, production and company management. He has also participated in several notable projects including Gulfstream's North Dome gas discovery, Qatar, Reunion Mining's Scorpion zinc, Namibia, which was subsequently developed by Anglo American, and Ocean Diamond Mining, which pioneered the independent diamond dredging industry off the west coast of southern Africa. He also served as a director of Tanager Energy Inc. (formerly MGold Resources Inc.) until October 2011 and Belmore Resources (Holdings) plc until July 2011 when it was acquired by Lundin Mining Ltd. Mr. Forrest was a director of Georex SA, and Poros SAS. See further discussion surrounding these directorships in Item 10 above.

During 2019, the Board of Directors determined that W. Ian L. Forrest qualified as the Audit Committee's "financial expert," as defined under the rules of the TSX and NYSE American and was "financially sophisticated" as defined under the rules of the TSX and NYSE American.

Mr. Forrest qualifies as a financial expert and is financially sophisticated, in that he has an understanding of generally accepted accounting principles and financial statements; is able to assess the general application of accounting principles in connection with the accounting for estimates, accruals and reserves; has experience analyzing or evaluating financial statements that entail accounting issues of equal complexity to the Company's financial statements (or actively supervising another person who did so); and has a general understanding of internal controls and procedures for financial reporting and an understanding of audit committee functions.

The members of the Audit Committee do not have fixed terms and are appointed and replaced from time to time by resolution of the Board of Directors.

The Audit Committee meets four times a year, at a minimum, and has access to all officers, management and employees of the Company and may engage advisors or counsel as deemed necessary to perform its duties and responsibilities as a committee.

The Audit Committee also meets with the Company's President and CEO, the Company's CFO, and the Company's independent auditors to review and inquire into matters affecting financial reporting, the system of internal accounting and financial controls, and the Company's audit procedures and audit plans. The Audit Committee also recommends to the Board of Directors the independent auditors to be appointed for each year. In addition, the Audit Committee reviews and recommends to the Board of Directors for approval the annual and quarterly financial statements and management's discussion and analysis. Finally, the Audit Committee undertakes other activities as required by the rules and regulations of the TSX and the NYSE American and other governing regulatory authorities.

#### **Pre-Approval Policies and Procedures**

All fees paid to the external auditors were pre-approved by the Audit Committee. This pre-approval involved a submission by the auditors to the Audit Committee of a scope of work to complete the audit and prepare tax returns, an estimate of the time involved, and a proposal for the fees to be charged for the audit. The Audit Committee reviewed this proposal with management and after discussion with the auditors, pre-approved the scope of work and fees.

#### **External Auditor Service Fees**

Effective August 9, 2019 and following Glencore's acquisition of a majority shareholder position on June 28, 2019, PricewaterhouseCoopers LLP (the "Former Auditor") resigned as the auditor of the company. There were no reservations or modifications in the Former Auditor's audit reports and no "reportable events" as such term is defined in National Instrument 51-102. PolyMet appointed Deloitte & Touche LLP (the "Successor Auditor") as the new auditor of the company. The resignation of the Former Auditor and recommendation for appointment of the Successor Auditor was approved by the audit committee and the board of directors of PolyMet on August 9, 2019.

The following outlines the expenditures for accounting fees billed by the Successor Auditor for the last two years ended:

<i>Year Ended</i>	<i>Audit Fees</i>	<i>Audit Related Fees</i>	<i>Tax Fees</i>	<i>All Other Fees</i>
December 31, 2019	US \$485,000	US \$Nil	US \$16,600	US \$Nil
December 31, 2018	US \$Nil	US \$Nil	US \$Nil	US \$Nil

The following outlines the expenditures for accounting fees billed by the Former Auditor for the last two years ended:

<i>Year Ended</i>	<i>Audit Fees</i>	<i>Audit Related Fees</i>	<i>Tax Fees</i>	<i>All Other Fees</i>
December 31, 2019	CDN \$100,000	CDN \$44,750	CDN \$36,533	CDN \$Nil
December 31, 2018	CDN \$245,000	CDN \$69,500	CDN \$27,633	CDN \$Nil



"Audit Fees" are the aggregate fees billed for the audit of the Company's consolidated annual financial statements.

"Audit-Related Fees" are fees billed for services reasonably related to the performance of the audit or interim review and services associated with registration statements and prospectuses.

"Tax Fees" are fees billed for professional services such as tax compliance or tax advice on actual or contemplated transactions.

## **17. Additional Information**

All documents referred to in this AIF are available for inspection at the Company's registered and records office, listed below, during normal office hours.

Farris, Vaughan, Wills & Murphy LLP  
2500 - 700 W Georgia St  
Vancouver BC  
Canada V7Y 1B3

In Canada, the Company will file reports and other information with the Canadian Securities Administrators. These materials include additional financial information provided in the Company's financial statements and MD&A for its most recently completed fiscal year. These materials also include directors' and officers' remuneration and indebtedness, principal holders of the Company's securities and securities authorized for issuance under equity compensation plans, as contained in the Management Information Circular for the most recent annual meeting of security holders that involves the election of directors. Additional reports, registration statements, and other information relating to PolyMet may be found on SEDAR at [www.sedar.com](http://www.sedar.com).

In the United States, the Company will file reports and other information with the SEC in accordance with the requirements of the Exchange Act. These materials, including this AIF and exhibits and the Company's financial statements and MD&A for its most recently completed fiscal year, may be inspected and copied at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549 and at the SEC's regional office at 500 West Madison Street, Suite 1400, Chicago, Illinois 60661. Copies of the materials may be obtained from the Public Reference Room of the Commission at 100 F. Street, N.E., Washington, D.C. 20549 at prescribed rates. The public may obtain information on the operation of the Commission's Public Reference Room by calling the Commission in the United States at 1-800-SEC-0330. Additional reports, registration statements and other information relating to PolyMet can also be inspected on EDGAR available on the SEC's website at [www.sec.gov](http://www.sec.gov).

## **SCHEDULE A AUDIT COMMITTEE CHARTER**

### **1. PURPOSE**

The purpose of the Audit Committee (in this charter, the "Committee") is to oversee the accounting and financial reporting processes of PolyMet Mining Corp. (the "Company"), the audits of the Company's financial statements, the qualifications of the public accounting firm engaged as the Company's independent auditor to prepare or issue an audit report on the financial statements of the Company and internal control over financial reporting, and the performance of the Company's internal audit function and independent auditor. The Committee reviews and assesses the qualitative aspects of the Company's financial reporting to shareholders, the Company's financial risk assessment and management, and the Company's ethics and compliance programs. The Committee is directly responsible for the appointment (subject to shareholder ratification), compensation, retention, and oversight of the independent auditor. The Committee also reviews and assesses the Company's processes to manage and control risk, except for risks assigned to other committees of the Board or retained by the Board.

### **2. STRUCTURE AND OPERATIONS**

The Committee shall be composed of not less than three (3) directors. Members of the Committee shall be independent and each shall be "financially literate" and will be appointed or reappointed at the meeting of the Board, immediately following the annual general meeting of the shareholders of the Company (the "AGM"), and in the normal course of business will serve a minimum of three (3) years. At least one member of the Committee shall in the judgment of the Board be an "audit committee financial expert" as defined by the rules and regulations of the Canadian Securities Administrators and the Securities and Exchange Commission. Each member shall continue to be a member of the Committee until a successor is appointed, unless the member resigns, is removed or ceases to be a director. The Board may fill a vacancy that occurs in the Committee at any time. Generally, no member of the Committee may serve on more than three audit committees of publicly traded companies (including the Audit Committee of the Company) at the same time.

"Financially Literate" means the ability to read and understand a set of financial statements that present a breadth and level of complexity of accounting issues that are generally comparable to the breadth and complexity of the issues that can reasonably be expected to be raised by the Company's financial statements.

The Board or, in the event of its failure to do so, the members of the Committee, shall appoint or reappoint, at the meeting of the Board immediately following the AGM, a chairman from among their number. The chairman shall not be a former officer of the Company and shall serve as a liaison between the Committee and members of the Company's management team ("Management").

Meetings of the Committee shall be held at least four times annually, provided that due notice is given and a quorum of a majority of the members is present. Where a meeting is not possible, resolutions in writing which are signed by all members of the Committee are as valid as if they had been passed at a duly held meeting. The frequency and nature of the meeting agendas are dependent upon business matters and affairs which the Company faces from time to time.

The Committee shall report to the Board on its activities after each of its meetings. In addition, it shall review and assess the adequacy of this charter annually and, where necessary, recommend changes to the Board for approval. The Committee shall undertake and review with the Board an annual performance evaluation of the Committee.

### **3. RESOURCES AND AUTHORITY**

The Committee shall have the resources and authority appropriate to discharge its responsibilities, including the authority to use internal personnel and to obtain advice and assistance from internal or external legal, accounting or other advisors and the funding for compensating any such external advisors. In addition, the Committee shall have sole authority to retain and terminate any such firms and to approve the fees and other retention terms related to the appointment such firms.

#### 4. RESPONSIBILITIES

The responsibilities of the Committee are:

1. To assist the Board of Directors in fulfilling its fiduciary responsibilities' relating to the Company's quality and integrity of accounting, auditing, and reporting practices and the integrity of the Company's internal accounting controls and management information systems;
2. To review with the auditors, internal accountants and management of the Company:
  - a. any audited financial statement of the Company, including any such statement that is to be presented to an annual general meeting or provided to shareholders or filed with regulatory authorities and including any audited financial statement contained in a prospectus, registration statement or other similar document, and
  - b. the financial disclosure in each Annual Report and Management Discussion and Analysis of the Company which accompanies such audited financial statement and in each such filing, prospectus, registration statement or other similar document;
3. To review with the internal accountants and management of the Company:
  - a. any unaudited financial statement of the Company, including any such statement that is to be presented to an annual general meeting or provided to shareholders or filed with regulatory authorities and including any unaudited financial statement contained in a prospectus, registration statement, Quarterly Report or other similar document,
  - b. the financial disclosure in each Quarterly Report and when applicable, Management Discussion and Analysis of the Company accompanying such unaudited financial statement and in each such filing, prospectus, registration statement or other similar document which accompanies such unaudited financial statement, and
  - c. in connection with the annual reports of the Company, review (i) Management's disclosure to the Committee and the independent auditor under Section 302 of the Sarbanes-Oxley Act, including identified changes in internal control over financial reporting; and (ii) the contents of the Chief Executive Officer and the Chief Financial Officer certificates to be filed under Sections 302 and 906 of the Sarbanes-Oxley Act and the process conducted to support the certifications;
4. To otherwise review as required and report to the Board of Directors with respect to the adequacy of internal accounting and audit procedures and the adequacy of the Company's management information systems;
5. To otherwise ensure that no restrictions are placed by Management on the scope of the auditors review and examination of the Company's accounts;
6. To appoint or replace the independent auditor and approve the terms on which the independent auditor is engaged for the ensuing fiscal year;
7. At least annually, evaluate the independent auditor's qualifications, performance, and independence, including that of the lead partner. The evaluation will include obtaining a written report from the independent auditor describing the firm's internal quality control procedures; any material issues raised by the most recent Public Company Accounting Oversight Board inspection, internal quality control review, or PCAOB review, of the firm or by any inquiry or investigation by governmental or professional authorities within the past five years, concerning an independent audit or audits carried out by the firm, and any steps taken to deal with those issues; and all relationships between the independent auditor and the Company;
8. Resolve any disagreements between Management and the independent auditor about financial reporting;
9. Establish and oversee a policy designating permissible services that the independent auditor may perform for the Company, providing for preapproval of those services by the Committee subject to the de minimis exceptions permitted under applicable rules, and quarterly review of any services approved by the designated member under the policy and the firm's non-audit services and related fees;

10. Ensure receipt from the independent auditor of a formal written statement delineating all relationships between the auditor and the Company, consistent with applicable requirements of the PCAOB regarding the independent auditor's communications with the Committee concerning independence, actively engage in a dialogue with the auditor about any disclosed relationships or services that may impact the objectivity and independence of the auditor, and take appropriate action to oversee the independence of the independent auditor;
11. Advise the Board about the Committee's determination whether the Committee consists of three or more members who are Financially Literate, including at least one member who has financial sophistication and is a financial expert;
12. Inquire of Management and the independent auditor about significant risks or exposures, review the Company's policies for risk assessment and risk management, and assess the steps Management has taken to control such risk to the Company, except as to those risks for which oversight has been assigned to other committees of the Board or retained by the Board;
13. Review with Management and the independent auditor:
  - a. The Company's annual assessment of the effectiveness of its internal controls and the independent auditor's attestation,
  - b. The adequacy of the Company's internal controls, including computerized information system controls and security,
  - c. Any "material weakness" or "significant deficiency" in the design or operation of internal control over financial reporting, and any steps taken to resolve the issue, and
  - d. Any related significant findings and recommendations of the independent auditor and internal audit together with Management's responses;
14. Develop, review, and oversee procedures for (i) receipt, retention, and treatment of complaints received by the Company regarding accounting, internal accounting controls, and auditing matters and (ii) the confidential, anonymous submission of employee concerns regarding accounting or auditing matters;
15. Review policies and procedures with respect to transactions between the Company and officers and directors, or affiliates of officers or directors, or transactions that are not a normal part of the Company's business, and review and approve those related-party transactions that would be disclosed pursuant to International Financial Reporting Standards, IAS 24 and SEC Regulation S-K, Item 404;
16. Review with Management and the independent auditor at least annually the Company's critical accounting policies and significant judgments and estimates, including any significant changes in the Company's selection or application of accounting principles and the effect of regulatory and accounting initiatives on the financial statements of the Company;
17. To ensure that the Company disseminates information concerning its financial position and results of operations to the public in a timely fashion;
18. Complete an annual evaluation of the Committee's performance;
19. Include a copy of the Committee charter as an appendix to the proxy statement at least once every three years, or disclose annually in the proxy statement where the charter can be found on the Company's website;
20. Set clear hiring policies for the Company's hiring of employees or former employees of the independent auditor who were engaged in the Company's account, and ensure the policies comply with any regulations applicable to the Company; and
21. Review with Management the Company's policies and processes for tax planning and compliance.

## **5.0 COMMUNICATIONS**

The independent auditor reports directly to the Committee. The Committee is expected to maintain free and open communication with the independent auditor, the internal auditors, and Management. This communication will include periodic private executive sessions with each of these parties.

## **6.0 EDUCATION**

The Company is responsible for providing new members with appropriate orientation briefings and educational opportunities, and the full Committee with educational resources related to accounting principles and procedures, current accounting topics pertinent to the Company, and other matters as may be requested by the Committee. The Company will assist the Committee in maintaining appropriate financial literacy.