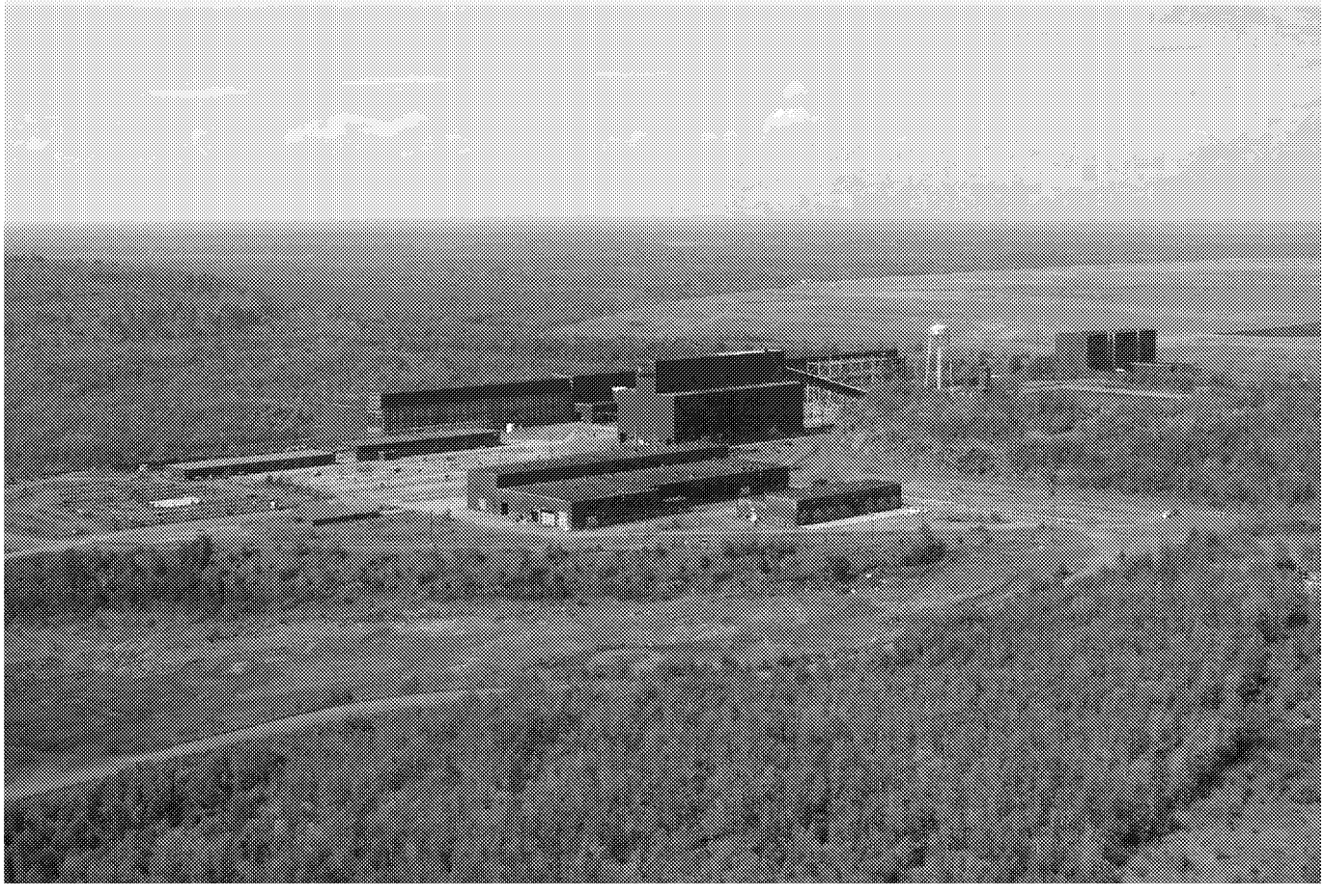
# FINANCIAL ASSURANCE REVIEW AND EVALUATION FOR THE NORTHMET MINING PROJECT

## PHASE I – TASK 1B REPORT

## PolyMet Financial Capabilities



Prepared for the Minnesota Department of Natural Resources

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EOR water ecology community

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Photo of NorthMet Mining facility, Hibbing, MN.

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## CAUTIONARY NOTE

The assumptions and analyses in this report were independently generated by Emmons and Olivier Resources Inc. (EOR), Spectrum Engineering and Environmental LLC (Spectrum) and Jardine Lloyd Thompson (JLT) for use by the State of Minnesota in its review of potential financial assurance mechanisms and requirements for the proposed NorthMet project. This report was created solely for government regulatory purposes related to the State of Minnesota's implementation of the financial-assurance requirements of the Minnesota Mineland Reclamation Act, Minn. Stat. § 93.44-93.51, and the Nonferrous Metallic Mineral Mining Rules, Minn. R. ch. 6132. None of the statements or analyses reported herein are made by or on behalf of PolyMet Mining Corp.

This report and the analyses contained herein were not generated by EOR, Spectrum, JLT, the State of Minnesota, or PolyMet Mining Corp. in order to generate mineral resource or mineral reserve estimates under any applicable securities laws.

This independent report is not a National Instrument 43-101 technical report. PolyMet Mining Corp.'s NI 43-101 technical report, last updated on January 14, 2013, is publicly available at: https://www.sec.gov/Archives/edgar/data/866028/000106299313001723/exhibit99-1.htm.

## EXECUTIVE SUMMARY

Financial assurances are a source of funds to be used by the Minnesota Department of Natural Resources (DNR) Commissioner if the mining company permittee fails to perform:

A. Reclamation activities including closure and post-closure maintenance needed if operations cease; and
B. Corrective action as required by the Commissioner if noncompliance with design and operating criteria in the permit to mine occurs.

The purpose of this report is to assess the ability of Poly Met Mining Inc. (PolyMet) to provide the required financial assurances and assess the financial risk to the State if PolyMet were unable to perform the required work, thus forcing the State to assume the liability and perform the work.

PolyMet Mining Corp. is a junior Canadian mining company which owns 100 percent of Poly Met Mining Inc. (PolyMet), a Minnesota corporation whose major asset is the future mining potential of the NorthMet project. Glencore, an Anglo–Swiss multinational commodity trading and mining company with headquarters in Baar, Switzerland, owns about 28% of PolyMet stock (as of May 2016) and holds sizeable loans to PolyMet. Glencore also has warrants to purchase more Polymet's shares within the next two years that, if exercised, would represent about 36% of PolyMet's stock.

The annual average production rate of the NorthMet project is projected to be about 72 million pounds of copper, 15 million pounds of nickel, 727 thousand pounds of cobalt, 75 thousand ounces of palladium, 20.5 thousand ounces of platinum, and 9.5 thousand ounces of gold per year. The value of that production will depend on metal prices. PolyMet's financial strength depends to a large degree on metal prices when the mine starts production and whether the mine opens during a period of rising or falling prices.

Forecasts of annual revenue range from $259M to $441M. The review of PolyMet's engineering financial feasibility studies that were undertaken at various stages of the project exploration indicate that the NorthMet project is economic for most metal pricing and cost scenarios. The economics also suggest that PolyMet should be able to obtain additional financing to develop the NorthMet mine

PolyMet will continue to need outside financing to remain viable. PolyMet's major asset is the capitalized mineral property, plant, and equipment (about $322M), which only has real value if all mining permits are issued and the mine development is financed.

Therefore, a key consideration in evaluating the financial assurance funding risks would be to determine the type and amount of financing that PolyMet can realistically obtain by itself (e.g. surety bonds, cash, etc.). Due to numerous mine bond forfeitures that caused considerable losses to the surety industry, it has now become more difficult for mining companies to obtain surety bonds. For a small or new mining company like PolyMet it would be very difficult to obtain a reclamation bond if there is any risk of bankruptcy which would be indicated if the financing or economics are not solid. It would be even more difficult to find a surety willing to guarantee a long-term financial assurance liability unless the project's economics are very strong.

PolyMet's potentially significant constraint in obtaining surety bonds indicates that, unless the NorthMet project is sold to a major mining company, a financial partnership is formed, or any other financial arrangement is made, only cash flow from the NorthMet operation would be available to fund the financial assurance trust, pay off the debts, and generate dividends for the shareholders.

Therefore, another important issue for the State would be to fully understand how PolyMet proposes to use cash flow to finance the assurance trust to the level required by the state, in the context of its other obligations: finance mining activities, repay debt and distribute shareholder dividends.

Ultimately, the State determines the total amount and timing to fund the trust. To inform this decision and assess the risk of PolyMet not meeting its annual trust funding requirements, access to an updated financial feasibility study and cash flow projections is paramount. To minimize the risk to the State and the third party, the assurances should be converted into a funded trust or escrow account within the first few years of operation.

If NorthMet project is not sold to a major mining company, a financial partnership is formed, or any other financial arrangement is made, PolyMet may be tempted to obtain the surety bonds from less stable sureties. If that is the case, the State should require that several sureties share the risk, and that the sureties pass some financial health test. The surety must be licensed to do business in the State of Minnesota. The surety should have a current A.M. Best Rating of A- or better, or a Standard & Poor's insurer's financial strength rating of A or better. The surety should also be classified as a Financial Size Category (FSC) of IX or greater.

To develop a more accurate assessment of the financial viability of the NortMet project, the financial feasibility study should be updated to include legacy costs, financial assurances estimates, reclamation costs, and long-term treatment and maintenance costs. This update should also include costs for activities identified in the Final EIS and not included in the latest financial feasibility study (e.g. stabilization of the tailings embankments), and any conditions

As part of the financial assurance and permit application review, PolyMet should be required to provide the State with an updated financial feasibility study and revised cash flow projections using a reasonable range of metal price assumptions. The State needs to review this information in order to form an opinion regarding PolyMet's cash flow capacity and to assess how the rate of financial assurance funding would affect the NorthMet's project economics. This is critical to determine the risk of PolyMet not meeting their financial assurance funding obligations.

## INTRODUCTION

The Minnesota Department of Natural Resources (DNR) is responsible for reviewing the Permit to Mine application for the Poly Met Mining Inc. (PolyMet) NorthMet project, including assessing the project's ability to meet all Permit to Mine requirements. The purpose of the Permit to Mine is to mitigate the possible adverse environmental effects of mining by ensuring orderly construction and development of a mine, sound operational practices, progressive reclamation of mined areas, and long-term protection of the environment. Financial assurance is required to provide adequate funding that the DNR could access in the event that a company abandons a project, fails to properly maintain or reclaim the site, or fails to correct noncompliance.

The purpose of this report is to assess PolyMet's ability to provide the financial assurances required for the NorthMet Permit to Mine. The report also assesses the financial risk to the State if PolyMet were unable to fund the required reclamation, long-term water treatment activities and other corrective actions that would be required as part of the NorthMet Permit to Mine application review. In that case, the State would be forced to assume the liability of completing all these tasks.

The first section describes what financial assurances are and why they are needed for mining permits. The second section summarizes the corporate structure and financial assets of PolyMet. The third section summarizes the revenue potential of the NorthMet project based on the metal grade and reserves, proposed production schedule, metal prices, and economic analysis. The fourth section evaluates the financial capability of PolyMet to meet the financial assurances required as part of the Permit to Mine application review.

The authors reviewed publicly available information for this report. Much of the information was available through standard filings required by the Canadian government. The review included PolyMet's corporate structure and assets, metal reserves in the NorthMet mining project, and the value of the NorthMet reserves given the history and trends of commodity prices. Technical and engineering economic data are provided in the NorthMet Canadian National Instrument (NI) 43-101 report which follows a codified set of rules and guidelines that clearly describe the project and its value. The reporting is overseen by the Canadian Securities Exchange and required by all mining companies whose stock is traded on the Toronto Stock Exchange. The NorthMet NI 43-101 report version reviewed was published October 2012 and updated in January 2013. The NorthMet NI 43-101 report and PolyMet audited financial statements are available on PolyMet's web site and the public sites SEDAR and EDGAR.

## 1. WHAT ARE FINANCIAL ASSURANCES?

Financial assurances are a source of funds to be used by the Minnesota Department of Natural Resources (DNR) Commissioner if the mining company permittee fails to perform:

C. Reclamation activities including closure and post-closure maintenance needed if operations cease; and
D. Corrective action as required by the Commissioner if noncompliance with design and operating criteria in the permit to mine occurs.

Before a mining permit can be granted, Minnesota Administrative Rule 6132.1200, financial assurance, requires the mining company to determine the cost to reclaim the mine and perform post-closure maintenance if operations cease for any reason during the first calendar year of operations. The cost estimate to reclaim the mine following a cease in operations must be updated annually (as required by rule) by the mining company and submitted to the State. Therefore, DNR must look many years ahead to anticipate the value of the financial assurance package needed to perform the required reclamation activities or corrective actions during the entire course of mining production. The mining company must provide satisfactory financial assurances to perform the necessary reclamation activities and corrective actions that must meet the following criteria listed in Minnesota Rule 6132.1200, subpart 5:

A. assurance of funds sufficient to cover the [reclamation and corrective action] costs estimated under [Minnesota Rule 6132.1200] subparts 2 and 3;
B. assurance that the funds will be available and made payable to the commissioner when needed;
C. assurance that the funds will be fully valid, binding, and enforceable under state and federal law;
D. assurance that the funds will not be dischargeable through bankruptcy; and
E. all terms and conditions of the financial assurance must be approved by the DNR Commissioner.

After mining begins, Minnesota Administrative Rules 6132.1200 and 6132.1300 require the mining company to provide an annual report, including a contingency reclamation plan. The contingency reclamation plan must include long-term operation and maintenance to be implemented if operations cease during the upcoming year, and it must provide financial assurance to ensure that there is a source of funds to perform the work if the State assumes the responsibility and must contract a third party to perform the work.

These rules require that the financial assurance plans and costs be revised annually to reflect the liability that will be incurred during the following year. However, the State recognizes that some reclamation activities will require long-term operation and maintenance, so the financial assurances plans and costs must recognize that the liabilities created in the following year will also have costs that extend far into the future.

It is important to note that EPA has indicated they intend to promulgate financial assurance rules for hard rock mining. This may affect financial assurance for this project in the future.

## 2. POLYMET STRUCTURE AND ASSETS

This section summarizes the corporate structure and financial assets of Poly Met Mining Inc. (PolyMet). Financial assets were determined from the total assets, liabilities, and shareholder equities of PolyMet based on the consolidated financial statements for two fiscal years: February 1, 2014 to January 31, 2016. Audited financial statements are available on PolyMet's website and the public sites SEDAR and EDGAR.

PolyMet Mining Corp.[1] is a junior Canadian mining company which owns 100 percent of PolyMet, a Minnesota corporation (Table 1). Glencore, an Anglo–Swiss multinational commodity trading and mining company with headquarters in Baar, Switzerland, owns about 28% of PolyMet stock (as of May 2016) and holds sizeable debts against PolyMet.

**Table 1. Poly Met Mining Inc. and PolyMet Mining Corp. Contact Information**

| Corporation | Office | Address |
|---|---|---|
| Poly Met Mining Inc. | Operational Headquarters | P.O. Box 475, 6500 County Road 666<br>Hoyt Lakes, Minnesota 55750<br>USA |
| | Executive Office | 444 Cedar Street, Suite 206<br>St. Paul, Minnesota 55101<br>USA |
| PolyMet Mining Corp. | Corporate Office | 100 King Street West, Suite 5700<br>Toronto, Ontario M5X 1C7<br>Canada |
| | Records Office | 700 West Georgia, 25th Floor<br>Vancouver, British Columbia V7Y 1B3<br>Canada |

[1] PolyMet website (http://www.polymetmining.com/investors/investor-faq/)

## 2.1. Assets

The total assets of PolyMet for the fiscal year ending on January 31, 2016 are $337.66M, comprised of $11.97M in current and $325.69M in long-term assets (Table 2). The major asset is the capitalized mineral property, plant, and equipment ($321.6M), which only has real value if all mining permits are issued and the mine development is financed. If permits are not issued, there would still be some small residual value associated to equipment that could be resold.

**Table 2. PolyMet Assets in 1,000's of US$ by Fiscal Year End Date**

| ASSETS | Fiscal Year Ending: | |
|---|---|---|
| | Jan. 31, 2016 | Jan. 31, 2015 |
| **Current** | | |
| Cash | $10,256 | $9,301 |
| Amounts receivable | $429 | $381 |
| Prepaid expenses | $1,285 | $1,108 |
| **Total Current** | **$11,970** | **$10,790** |
| **Non-Current** | | |
| Amounts receivable | $2,153 | $0 |
| Mineral Property, Plant and Equipment | $321,649 | $296,247 |
| Wetland Credit Intangible | $1,888 | $6,192 |
| **Total Non-Current** | **$325,690** | **$302,439** |
| **TOTAL** | **$337,660** | **$313,229** |

Source: PolyMet January 2016 Audited Balance Sheet

## 2.2. Liabilities

The total liabilities of PolyMet for the fiscal year ending on January 31, 2016 are $153M, including current liabilities of $9.8M (Table 3). The liability includes $65.7M of environmental liability (separate from the environmental liability associated to the Financial Assurance) and $84M of debt. PolyMet is indebted to Glencore, which is not unusual when a small mining company requires financing to develop and permit a large project. Glencore has the option to convert $36M of debt into shares.

**Table 3. PolyMet Liabilities in $1,000's of US$ by Fiscal Year End Date**

| LIABILITIES | Fiscal Year Ending: | |
|---|---|---|
| | Jan. 31, 2016 | Jan. 31, 2015 |
| **Current** | | |
| Accounts payable and accrued liabilities | $3,348 | $2,673 |
| Convertible debt | $0 | $33,451 |
| Non-convertible debt | $4,962 | $4,614 |
| Environmental rehabilitation provision * | $1,498 | $1,724 |
| **Total Current** | **$9,808** | **$42,462** |
| **Non-Current** | | |
| Convertible debt | $35,986 | $0 |
| Non-convertible debt | $43,023 | $7,855 |
| Environmental rehabilitation provision * | $64,186 | $70,536 |
| **Total Non-Current** | **$143,195** | **$78,391** |
| **TOTAL** | **$153,003** | **$120,853** |

**Source:** PolyMet January 2016 Audited Balance Sheet

* Environmental costs associated to PolyMet's present obligation pertaining reclamation, long-term water quality permit compliance, and O&M responsibilities for parts of the former LTV mining site.

## 2.3. Shareholders' Equity

As of May 2016, PolyMet issued 277,557,082 shares. During the past 5 years, the stock price has ranged from a high of $1.80 per share to about $0.80 per share recently (May 2016), as shown in Figure 1. The stock price has no direct bearing on the financial stability of PolyMet, but it does indicate the opinion of the mining stock market. Recently the stock has been trading around $1.00 ± $0.20 per share. The May 2016 market value of PolyMet, based on the stock price multiplied by the number of outstanding shares, is approximately $277M.

Per the January 31, 2016 audit report, the paid in share capital is $242.9M (Table 4). According to a filing with the British Columbia Securities Commission in 2001, PolyMet authorized 1,000,000,000 shares to be able to raise additional capital. On January 31, 2016, PolyMet had $10.256M cash/cash equivalents and $2.162M working capital on hand. During the last 3 years, losses ranged from $7M to $9M each year, which reflect the cost to work on environmental review, permitting, and engineering.

The January 31, 2016 audit notes indicate that Glencore presently owns 78,724,821 shares representing 28.4% of PolyMet's issued shares. Glencore has warrants to exchange debt for 27,853,358 common shares at $1.292 per share prior to the March 31, 2018 repayment date (Table 5). Glencore also has warrants to purchase 6,458,001 common shares at $0.8231 per share at any time until December 31, 2017 (Table 5). These numbers do not include the recent $30M equity financing expansion. If Glencore were to exercise all of its rights and obligations under these agreements, it would own 113,036,180 common shares of PolyMet, representing 36.2% on a partially diluted basis, or 34.0% on a fully diluted basis.

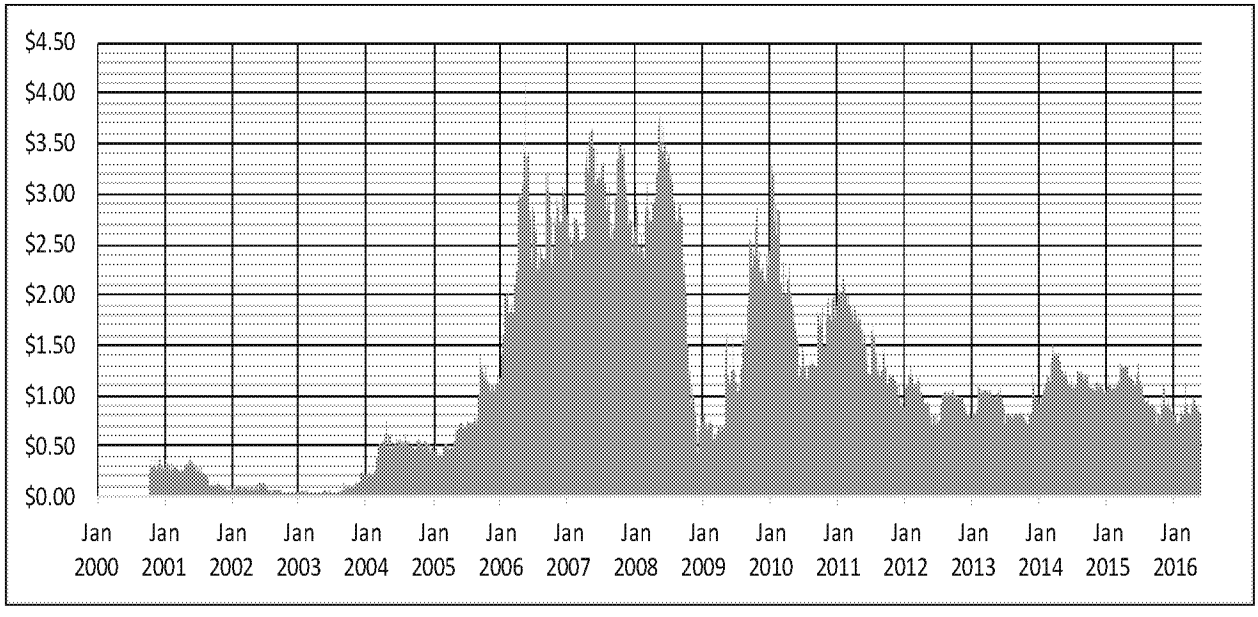


**Figure 1. Poly Met Mining Inc. Share Price History (2001 – May 2016)**

**Table 4. PolyMet Shareholders' Equity in $1,000's of US$ by Fiscal Year End Date**

| SHAREHOLDERS EQUITY | Fiscal Year Ending: | |
|---|---|---|
| | Jan. 31, 2016 | Jan. 31, 2015 |
| Share Capital | $242,917 | $241,489 |
| Share Premium | $1,151 | $3,007 |
| Equity Reserves | $53,759 | $51,704 |
| Deficit | $(113,170) | $(103,824) |
| **TOTAL** | **$184,657** | **$192,376** |

Source: PolyMet January 2016 Audited Balance Sheet

**Table 5. PolyMet Capital Structure as of January 31, 2016**

| | | |
|---|---|---|
| Shares outstanding | 277.5 | million |
| Glencore convertible debt | 27.8 | million ($36.0 million @ $1.2920 per share) |
| Glencore Warrants | 6.5 | million @ $0.8231, expiring 12/2017, subject to mandatory exercise if the 20-day volume weighted average price ("VWAP") of PolyMet common shares is equal to or greater than 150% of the exercise price and PolyMet has received permits and construction finance is available ("Early Maturity Event" |
| Other Warrants | 0.5 | million @ average $2.1678, expiring 6/2016 |
| Options | 19.0 | million @ average $1.29, expiring 2/2016 to 7/2024 |
| Other Rights | 0.7 | million |
| Fully Diluted | 332.0 | million (including out-of-money options/warrants) |
| Glencore | 113.0 | million (34.0% fully diluted) |
| Insiders | 19.4 | million (5.8% fully diluted) |

# 3. NORTHMET ECONOMIC SENSITIVITY

PolyMet's NorthMet mining project is part of the northeastern Minnesota Duluth Complex, one of the world's largest known undeveloped deposits of copper, nickel and other precious metals. If permitted, the project would be the first in Minnesota to commercially extract nonferrous metals from the Duluth Complex, thus potentially setting a precedent for the permitting and development of nonferrous metal mine operations. The project is located near the community of Hoyt Lakes, Minnesota, within an existing mining district with many operating and former iron (ferrous) mines and processing facilities in the area.

The purpose of this section is to analyze the future revenue potential of the NorthMet project based on the metal grade and reserves, the proposed production schedule, the capital needed to develop the mine, and the sensitivity of revenue to fluctuating metal prices.

## 3.1. Metal Grade and Reserves

Metal grade and reserves were summarized for NorthMet based on the *NI 43-101 Technical Report on the NorthMet Deposit in Minnesota, USA* prepared by AGP Mining Consultants and updated January 2013 (Table 6).

**Table 6. Metal grade and reserves of the NorthMet Project (AGP December 2007)**

| Metal | Copper | Nickel | Sulfur | Platinum | Palladium | Gold | Cobalt | Total |
|---|---|---|---|---|---|---|---|---|
| **Grade** | **(%)** | **(%)** | **(%)** | **(ppb)** | **(ppb)** | **(ppb)** | **(ppm)** | **n/a** |
| Measured | 0.285 | 0.083 | 0.71 | 71 | 258 | 36 | 74 | n/a |
| Indicated | 0.256 | 0.075 | 0.69 | 66 | 231 | 34 | 70 | n/a |
| Measured + Indicated | 0.265 | 0.077 | 0.69 | 68 | 239 | 35 | 71 | n/a |
| Inferred | 0.273 | 0.079 | 0.65 | 73 | 263 | 37 | 56 | n/a |
| **Reserve** | **(million lbs.)** | **(million lbs.)** | **(million lbs.)** | **(1,000 oz.)** | **(1,000 oz.)** | **(1,000 oz.)** | **(million lbs.)** | **(Million short tons of ore)** |
| Measured | 1,154 | 337 | 2,879 | 418 | 1,526 | 214 | 30 | 202.5 |
| Indicated | 2,519 | 738 | 6,749 | 950 | 3,307 | 491 | 68 | 491.7 |
| Measured + Indicated | 3,673 | 1,075 | 9,628 | 1,369 | 4,833 | 704 | 98 | 694.2 |
| Inferred | 1,257 | 361 | 2,983 | 488 | 1,761 | 245 | 26 | 230 |

From the *Updated NI 43-101 Technical Report on the NorthMet Deposit in Minnesota, USA*, Tables 14-27 & 28: Resource above 0.00 ft. Comparison - Grade at US$7.42 NMV Cut-off, AGP December 2007. The Net Metal Value (NMV) formula used and described in Section 17.2.12 of the NI 43-101 report includes the gross metal price multiplied by the processing recovery minus refining, insurance and transportation charges.

## 3.2. Proposed Production Schedule

Figure 2 shows the proposed NorthMet production schedule. According to the *Updated NI 43-101 Technical Report on the NorthMet Deposit in Minnesota, USA*, there is potential to expand the open pit depending on future metal prices and mining costs. At this time, no such an expansion has been proposed and it is not covered in the Final EIS. Any expansion plan would first be subject to any required environmental review and permitting.

If a permit is issued, preproduction development would likely occur in the first two years. The proposed annual average production rate of the NorthMet project for the first 5 years of production is estimated to be approximately 72 million pounds of copper, 15 million pounds of nickel, 727 thousand pounds of cobalt, 75 thousand ounces of palladium, 20.5 thousand ounces of platinum, and 9.5 thousand ounces of gold per year. The average mining rate during this period is expected to be 12.7 Million short tons per year (Mtpy) ore and 22.3 Mtpy waste (NorthMet NI 43-101 report).

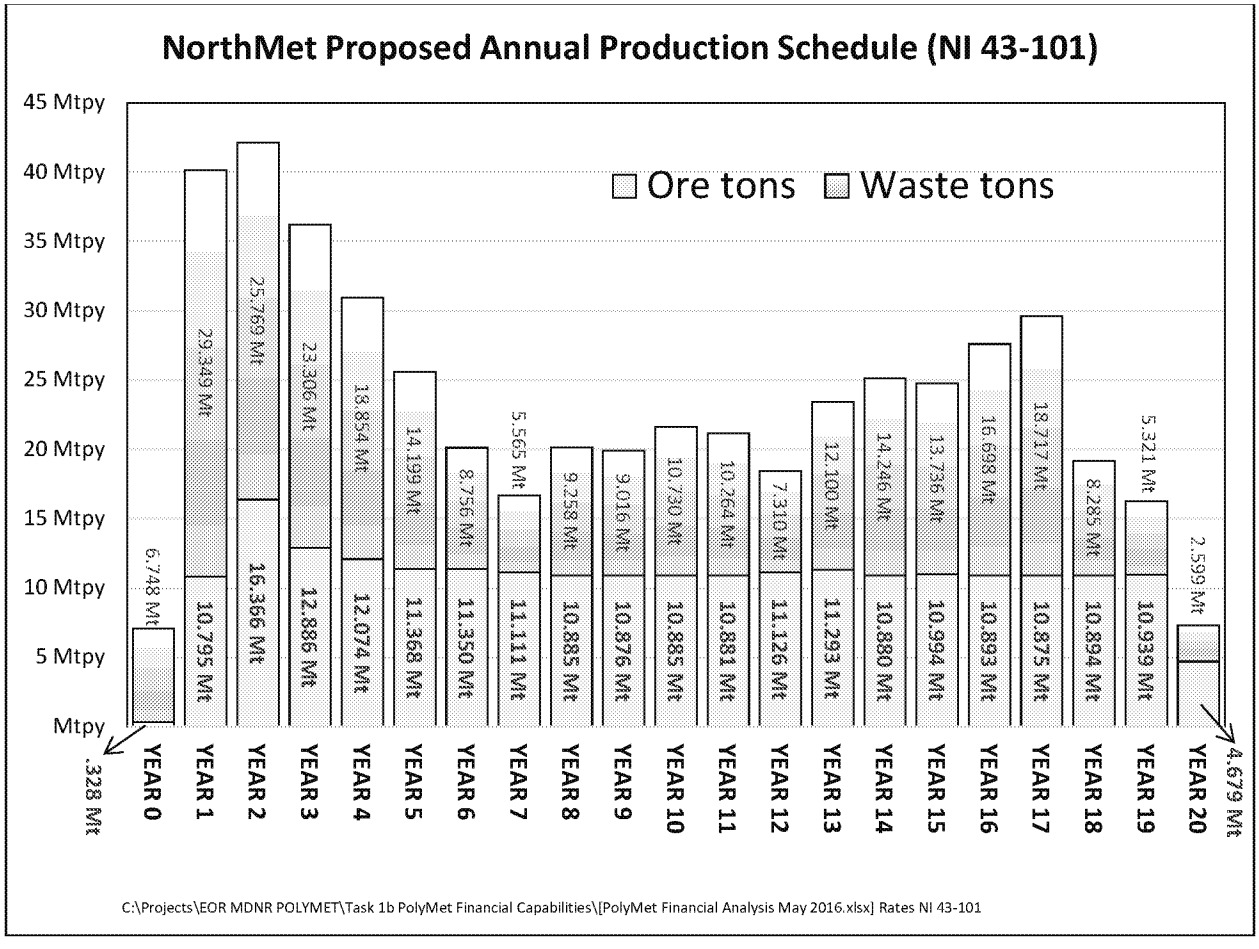


**Figure 2. NorthMet Proposed Production Schedule of Ore and Waste in Million tons per year (Mtpy; NI 43-101)**

## 3.3. NorthMet Economic Viability

The economic viability of NorthMet is a function of the capital PolyMet needs to invest to place the NorthMet mine into production (including financial assurance), the revenue (which depends on metal prices), the mining and processing costs and recoveries, and the timing of the cash flows.

The Net Present Value (NPV), the Return on Investment (RI) rate, and the payback period, are metrics used to assess the project viability and risk. For a large company with multiple investment opportunities, these metrics are used to compare or rank different projects. For a company with a single project such as PolyMet, these metrics will be used by investors, banks, and sureties to assess the financial risk of lending money or guaranteeing the reclamation and other long term O&M financial assurances. The State will want to review these metrics as part of the financial assurance evaluation to determine the rate that the financial assurance trusts must be fully funded.

If the Permit to Mine is issued, an estimate of the amount of capital PolyMet will need to invest to place the NorthMet mine into production is summarized in Table 7. Other key economic highlights of NorthMet are summarized in Table 8. When these engineering cost estimates were being prepared, legacy costs, financial assurances estimates, reclamation costs, long-term treatment and maintenance costs, and other activities identified in the Final EIS, were not yet fully defined. Therefore are not included in Table 7 or Table 8. These cost components should be revised and included in an updated financial feasibility study.

The revenue potential of the NorthMet project is very sensitive to the prices of copper and nickel. The metal prices have fluctuated substantially since the inception of this project, and have a material effect on the projected NorthMet cash flow. Commodity charts of the historic price range of the metals that PolyMet would produce are illustrated in Figure 6 through Figure 11. Copper and nickel prices rose after 2006 but have recently fallen back to 2006 levels. Cobalt prices have steadily dropped. Palladium, platinum and gold prices have increased, but aren't major revenue generators compared to nickel and copper.

The value of the NorthMet project is very sensitive to metal price assumptions. Multiple metal price scenarios are presented in this report to illustrate the sensitivity of NorthMet revenue to fluctuating metal prices. The four scenarios are:

1) The September 2006 Definitive Feasibility Study (DFS) base price,

2) The September 2007 Wardrop original feasibility study "Mine Plan Price",

3) The May 2008 update to the 2006 DFS price, and

4) May 2016 prices.

Both the September 2006 DFS and the open pit mining limit ("Mine Plan Price") assumed conservative (i.e. low) metal prices. The 2008 update to the 2006 DFS metal prices were based on the most recent 3-year running average at the time of that study. These prices assume an annual average production rate of 72 million pounds of copper, 15 million pounds of nickel, 727 thousand pounds of cobalt, 75 thousand ounces of palladium, 20.5 thousand ounces of platinum, and 9.5 thousand ounces of gold per year. Figure 3 and Figure 4 illustrate the four metal price scenarios for the expected annual average production rate of the NorthMet mine.

Note that the "Mine Plan Price" was the metal price used to calculate the pit limits for the proposed mine in the original feasibility study. The tonnage and average grade mined are constrained by the pit limits, which were determined using a combination of the cash costs and the revenue at that time. If the mine is permitted and goes into production, these may change in order to optimize the project. If the actual metal prices are higher than the Mine Plan Price, then it may be feasible to modify the pit limits (subject to any required environmental review and permitting) to recover additional resource before backfilling. Conversely, if the actual metal prices are lower than the Mine Plan Price, then the project may become less financially attractive, or it may be necessary to reduce the tonnage mined by focusing on higher grade zones, if feasible.

The annual revenue forecast as a function of the metal price, metal grades, and production rate is illustrated for the four metal price scenarios in Figure 5. The estimated revenue is based on the average annual production of metal less the charges for refining, insurance and transportation.

Even though the metal prices have dropped since 2008, the total revenue based on May 2016 prices remains above the total revenue based on the conservative prices assumed in the 2006 DFS base price. This indicates that the project remains viable even though operating costs and capital have changed. The Definitive Feasibility Study economic analyses used conservatively low pricing assumptions to show that the project was viable even with low metal prices.

Actual metal prices have varied considerably over the period of investigation, resulting in a revenue swing of about $150 million annually between the high and low metal price scenarios (Figure 5). As of May, 2016, metal prices are at the low end of the range.

The January 2013 NorthMet NI 43-101 Technical Report estimated a NPV for the NorthMet project of $649.4 million and a Net Metal Value (NMV) cut-off of US$7.42/t, based on the metal prices assumed at that time. These estimates were based on 694 million tons of measured and indicated mineral resource grading 0.27% copper, 0.08% nickel and 0.01 opt[2] of precious metals, and 230 million tons of inferred mineral resources grading 0.27% copper, 0.08% nickel and 0.01 opt of precious metals. The NMV was calculated using a copper price at $1.25 per pound, nickel at $5.60 per pound, palladium at $210 per ounce, platinum at $800 per ounce, and gold at $400 per ounce. These prices take into account refining, insurance and transport cost, recovery ore to concentrate, and recovery concentrate to metal. Revenue from cobalt was not included.

**Table 7. NorthMet Capital Costs in million US$**

| Capital Costs (million $) | Full Project | % Change from DFS | Initial Concentrate Sales |
|---|---|---|---|
| **Initial Definitive Feasibility Study (DFS)** | **$379.8 M** | | **$138.7 M** |
| + Escalation and other scope changes | $137.0 M | *36%* | $108.9 M |
| + Environmental measures | $85.1 M | | $64.7 M |
| **TOTAL** | **$601.9 M** | *58%* | **$312.3 M** |
| *Total change from DFS* | *$222.1 M* | | *$173.6 M* |

Source: 2013 updated NorthMet NI 43-101 Technical Report, page 22-5

[2] Opt is troy ounces per ton. 1.0 troy ounce= 1.097142857 avoirdupois ounces.

**Table 8. NorthMet Key Economic Highlights**

| Component | Units | September 2006 Definitive Feasibility Study | May 2008 Update |
|---|---|---|---|
| **Operating Plan** | | | |
| Proven and probable reserves | million tons | 181.7 | 274.7 |
| Ore mined – life of operation | million tons | 181.7 | 224.0 |
| Overburden removed (capitalized under site preparation) | million tons | -- | 18.5 |
| Waste | million tons | 302.3 | 285.3 |
| **Operating costs per ton processed** | | | |
| Mining and delivery to plant | $/ton | 3.80 | 4.31 |
| Processing | $/ton | 6.75 | 8.07 |
| G&A | $/ton | 0.46 | 0.94 |
| Total | $/ton | 11.02 | 13.33 |
| **Metal price assumptions (SEC-standard)** | | | |
| Copper | $/lb. | 2.25 | 2.90 |
| Nickel | $/lb. | 7.80 | 12.20 |
| Cobalt | $/lb. | 16.34 | 23.50 |
| Palladium | $/oz. | 274 | 320 |
| Platinum | $/oz. | 1,040 | 1,230 |
| Gold | $/oz. | 540 | 635 |
| **Economic summary** | | | |
| Annual earnings before interest, tax, depreciation and amortization (EBITDA) – average first five years | million $ | 175.3 | 217.3 |
| NPV of future after tax cash flow discounted at 7.5% | million $ | 595.4 | 649.4 |
| Internal rate of return (after tax) | million $ | 26.7% | 30.6% |
| **Sensitivity: 10% ± price = change in $million in EBITDA** | | | |
| Copper | million $ | 15.7 | 18.6 |
| Nickel | million $ | 9.3 | 13.3 |
| Cobalt | million $ | 0.9 | 0.9 |
| Palladium | million $ | 2.0 | 1.7 |
| Platinum | million $ | 2.1 | 1.7 |
| Gold | million $ | 0.5 | 0.3 |
| **Copper costs** | | | |
| cash – co-product method | $/lb. | 0.81 | 1.05 |
| cash – by-product method | $/lb. | 0.06 | (0.28) |

Source: 2013 updated NorthMet NI 43-101 Technical Report, page 1-9

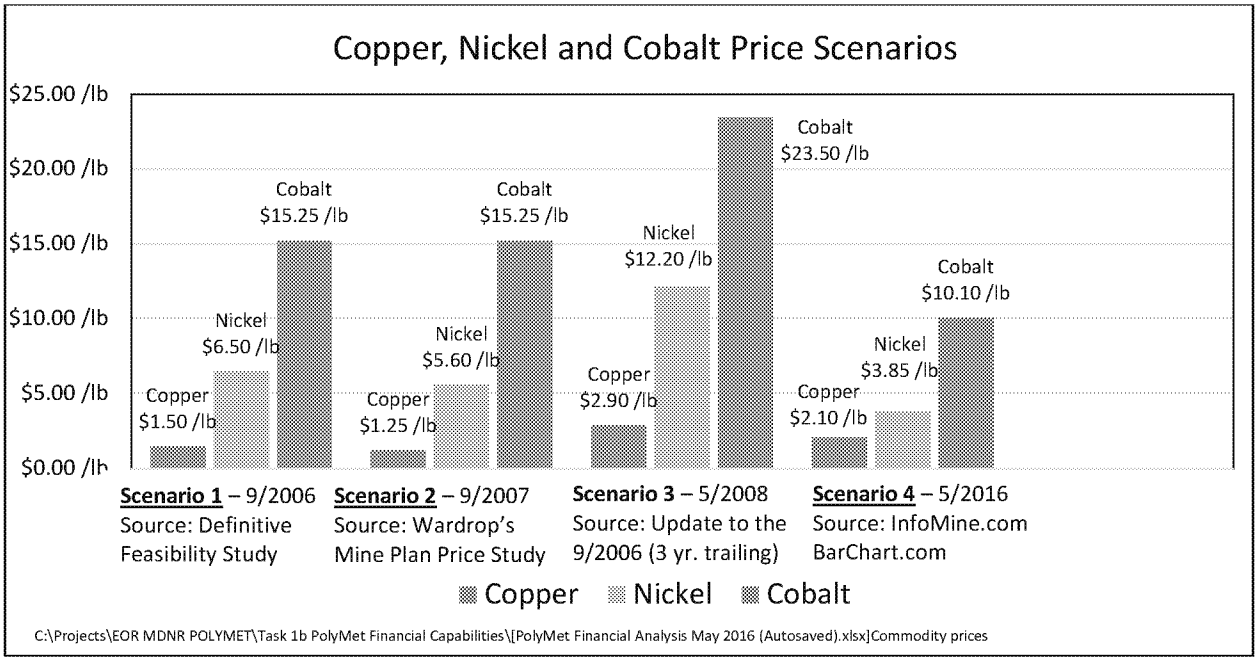


**Figure 3. Copper, Nickel and Cobalt Prices used for Various Valuations**

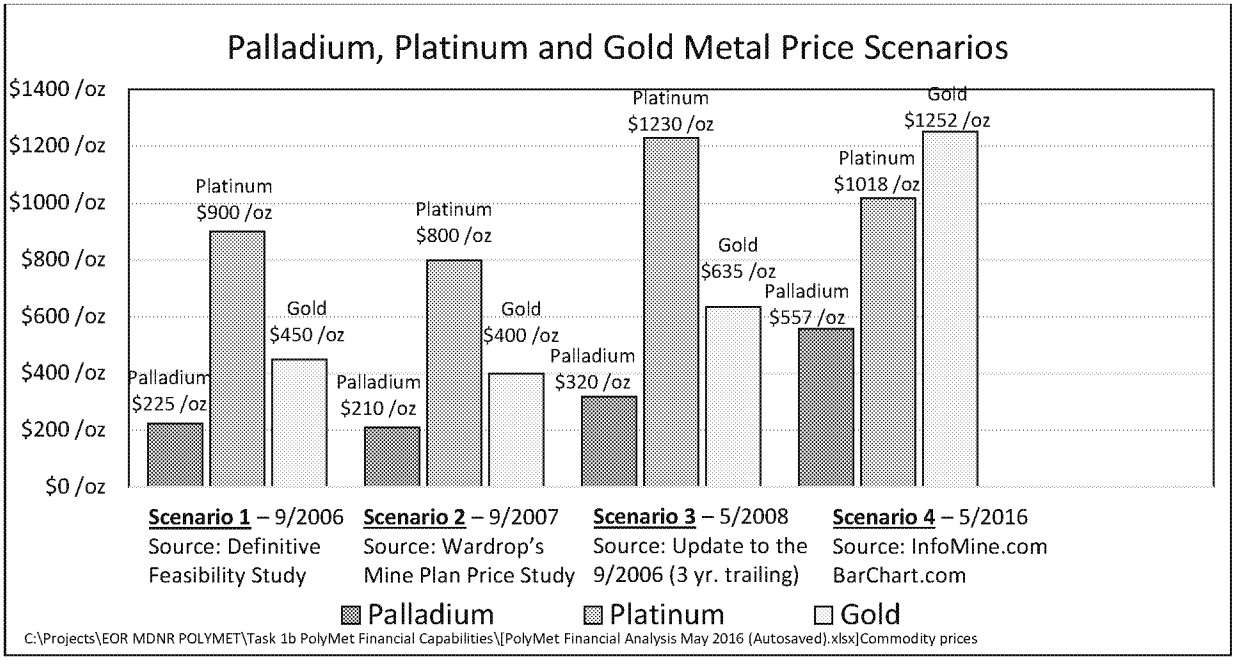


**Figure 4. Palladium, Platinum and Gold Metal Prices Used for Various Valuations**

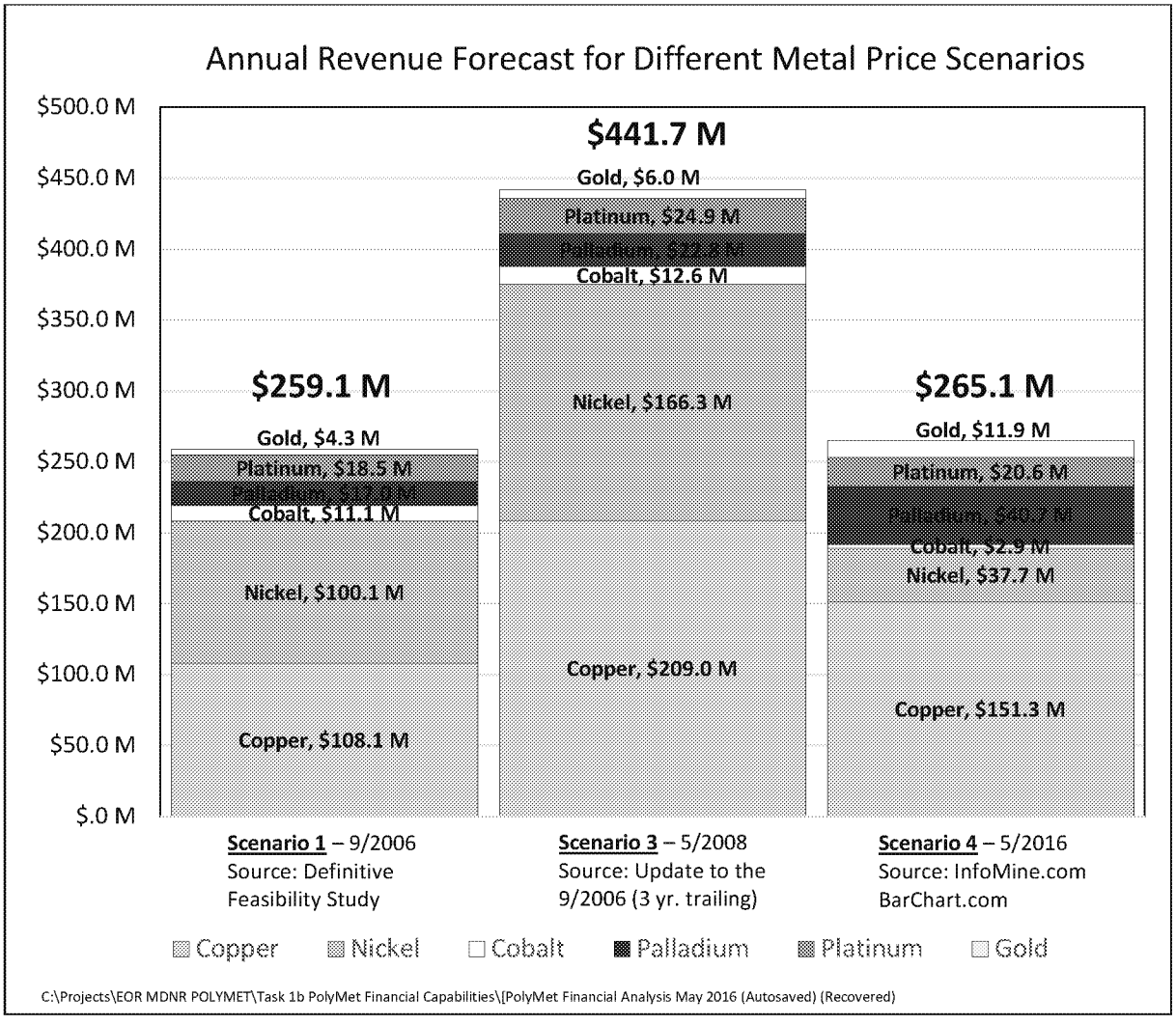


**Figure 5. Annual Revenue Forecast for Different Metal Price Scenarios (first 5 years)**

Source: January, 2013 Updated NI 43-101 Technical Report on the NorthMet Project by AGP Mining Consultants. Note: Assumes an annual average production rate of 72M lbs. of copper, 15M lbs. of nickel, 727 thousand lbs. of cobalt, 75 thousand oz. of palladium, 20.5 thousand oz. of platinum, and 9.5 thousand oz. of gold.

## 3.4. Historic Metal Prices

Commodity charts for the historic price range of the metals that PolyMet would produce are illustrated in Figure 6 through Figure 11 below.

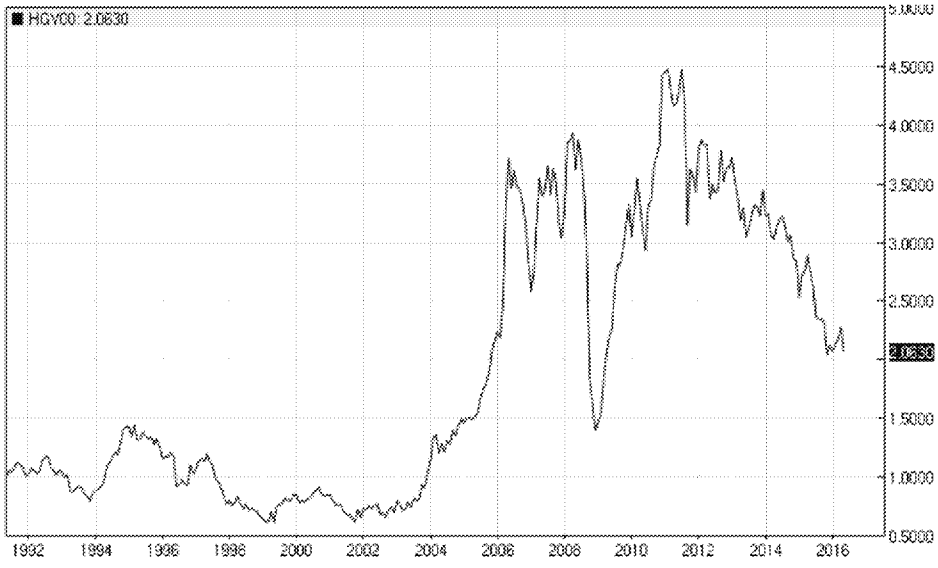


**Figure 6. Historic Copper Price in U.S. $/lb., 1992-2016 (Accessed May 2016 from BarChart.com)**

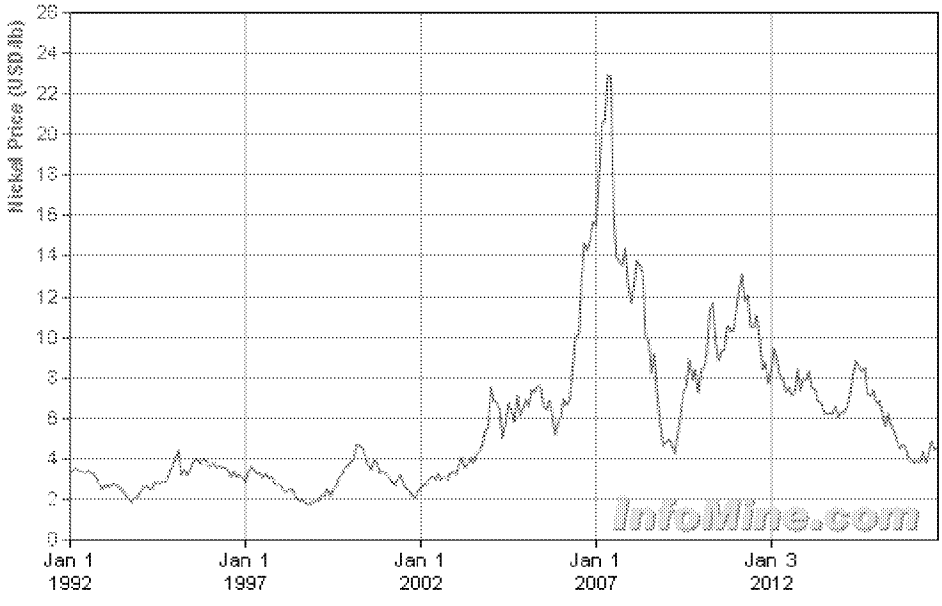


**Figure 7. Historic Nickel Price in U.S. $/lb., 1989-2016 (Accessed May 2016 from InfoMine.com)**

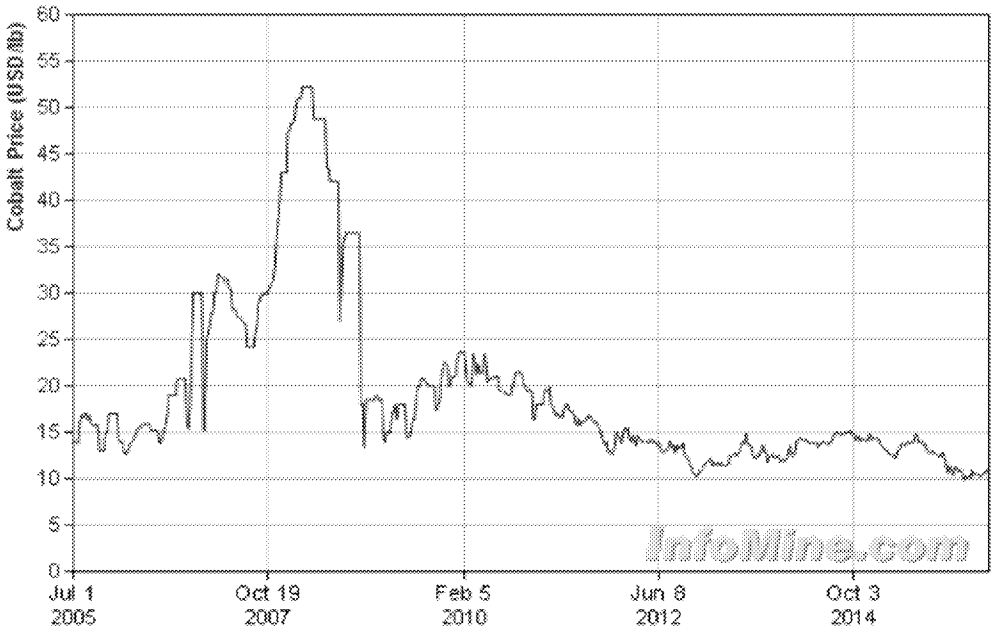


**Figure 8. Historic Cobalt Price in U.S. $/lb., 2005-2016 (Accessed May 2016 from InfoMine.com)**

**Figure 9. Historic Palladium Price in U.S. $/oz., 1992-2016 (Accessed May 2016 from BarChart.com)**

**Figure 10. Historic Platinum Price in U.S. $/oz., 1992-2016 (Accessed May 2016 from BarChart.com)**

**Figure 11 Historic Gold Price in U.S. $/oz., 1992-2016 (Accessed May 2016 from BarChart.com)**

## 3.5. Economic Evaluation

PolyMet Mining Corp. is a small Canadian mining company whose major asset is the NorthMet copper-nickel precious metals project that is being developed by its wholly owned subsidiary, Poly Met Mining, Inc. (PolyMet).

Engineering feasibility studies were undertaken by PolyMet at various stages of the NorthMet project exploration (listed in the 2013 NorthMet NI 43-101 report). All of the studies concluded that the project is economically feasible given the cost and revenue assumptions at the time.

The financial documents indicate that the exploration, environmental review, permitting, and engineering of the NorthMet project are currently being funded by issuing equity and borrowing money from Glencore, a major mining and commodity trading company headquartered in Switzerland. The documents also indicate that PolyMet will require additional funding (debt, equity or acquisition) in order to construct the mine, the waste rock facilities, the tailings impoundment, the mill, and to obtain financial assurances for the Permit to Mine. The economics suggest that PolyMet should be able to obtain additional financing to develop the NorthMet mine.

Information on costs associated with the existing tailings basin and the former LTV Mining Company legacy impacts were not available at the time of this report. The financial feasibility study should be updated to include legacy costs, financial assurances estimates, reclamation costs, and long-term treatment and maintenance costs. This update should also include costs for activities identified in the Final EIS and not included in the latest financial feasibility study (e.g. stabilization of the tailings embankments), and any other conditions.

Previous engineering estimates available in the public domain place the NPV of NorthMet in the $500M to $650M range, but all the cash flow details and assumptions supporting these numbers were not found and may not be part of public filings.

Cash flow projections and sources and uses of capital must also be refined to include the latest revisions to the operating plan, current revenue/cost projections, and financial assurances.

# 4. FINANCIAL RISKS

Key risks to the capability of Poly Met Mining Inc. (PolyMet) to provide financial assurances for the NorthMet project are:

- The amount of capital investment needed,
- The type and cost of financing that can be obtained,
- The sensitivity of annual revenue to metal prices,
- The costs to reclaim the mine and manage the long-term water treatment and O&M
- The ability of PolyMet to obtain surety bonds, and
- The timing of the anticipated future cash flows.

The ultimate objective for the State regarding financial assurance is to determine the total amount of funds and the financing sequence required from PolyMet to provide adequate environmental protection in the event that PolyMet abandons a project, fails to properly maintain or reclaim the site, or fails to correct noncompliance.

To that end, it is important to assess PolyMet's cash flow capacity to finance the assurance trust, to the level required by the state, in the context of its other obligations: finance mining activities, repay debt and distribute shareholder dividends. Ultimately, the State determines the total amount and timing to fund the trust. To inform this decision and assess the risk of PolyMet not meeting its annual trust funding requirements, access to an updated financial feasibility study and cash flow projections is paramount

As part of the financial assurance and permit application review, PolyMet should be required to provide the State with an updated financial feasibility study and revised cash flow projections using a reasonable range of metal price assumptions.

PolyMet will continue to need outside financing to remain viable. PolyMet's major asset is the capitalized mineral property, plant, and equipment (about $322M), which only has real value if all mining permits are issued and the mine development is financed. Nevertheless, if the Permit to Mine were to be issued, the economics suggest that PolyMet should be able to obtain additional financing to develop the mine.

The amount of capital investment that would be required, if the Permit to Mine is issued, to finance the mine until it reaches full production and financially becomes self-supporting, depends on several factors. The first factor is whether the mine sells the NorthMet metal concentrates or further processes the concentrates on site. Table 22-4 in the January 2013 NorthMet NI 43-101 report estimates $601.9M in capital costs if the concentrates are processed on site and $312.3M in capital costs if they are not processed on site. Another factor is the additional capital required to stabilize the tailings embankments (i.e. enhanced CDSM/Buttress). The last factor is the environmental costs associated to PolyMet's legacy environmental obligations for parts of the former LTV mining site.

If PolyMet becomes bankrupt after the NorthMet mine is developed and operating for several years before all the debts are paid off, the State must ensure that all of the reclamation and long-term

operation and maintenance financial assurance funds are only for the benefit of the State (as required by rule) and not for any other creditors, and cannot be pledged as collateral.

Similarly, in the event of a bankruptcy or any other reason that prevents PolyMet from operating the reclamation and long-term treatment facilities, all the assets needed by the State to operate and maintain the site should become State property, and not sold to satisfy other creditors. These include the real property, the water treatment collection and treatment facilities, mobile equipment, etc.

PolyMet's financial strength depends to a large degree on the metal prices when the mine would start production and whether the mine would open during a period of rising or falling prices. The NorthMet mine economics are very sensitive to the metal commodity price assumptions and somewhat sensitive to the cut-off grade assumption (how big and profitable a mineral deposit is assumed to be). When metal prices are high, the revenue can generate a healthy cash flow, but when prices are low, the revenue can drop as much as $150 million per year (as determined in Section 3.3 of this report), thus reducing the rate of return and increasing the economic risk. Nevertheless, all of the economic evaluations completed to date concluded that the NorthMet project was economical even assuming fairly conservative (i.e. low) metal prices.

PolyMet may require a third party to guarantee the assurances that PolyMet cannot fund upfront. To minimize the risk to the State and the third party, the assurances should be converted into a funded trust or escrow account within the first few years of operation.

Unless the project is sold to a major mining company, a financial partnership is formed, or any other financial arrangement is made, only cash flow from operation would be available to pay off the debts, fund the financial assurance trust, and generate dividends for the shareholders. The NorthMet project NPV and rate of return depend on the timing of cash flow from operations, and the timing and amount of money that should be placed in the financial assurance trust. If the unfunded component of the trust is secured by a surety bond, then the bond should be set up to immediately be accessible to make up the balance, rather than make up the balance over several years. As required by rule, the State needs to make sure that the financial assurance costs are covered at all times and immediately available.

A key consideration in evaluating the financial assurance funding risks would be to determine the type and amount of financing that PolyMet can realistically obtain by itself (e.g. surety bonds, cash, etc.). Due to numerous hardrock mine bond forfeitures that caused considerable losses to the surety industry, it has now become more difficult for mining companies to obtain surety bonds. For a small or new mining company like PolyMet it would be very difficult to obtain a reclamation bond if there is any risk of bankruptcy. It would be even more difficult to find a surety willing to guarantee a long-term financial assurance liability

A large company with a portfolio of other revenue sources and assets can more easily obtain surety bonds compared to a small company whose only asset is a single mine. If NorthMet project is not sold to a major mining company, a financial partnership is formed, or any other financial arrangement is made, PolyMet may propose to obtain the surety bonds from less stable sureties. If that is the case, the State should require that several sureties share the risk, and that the sureties pass some financial health test.

## 4.1. Surety Evaluation

When evaluating the quality of surety, there are currently four key agencies, which rate the financial strength of insurance companies: Standard & Poor's, A.M. Best, Fitch, Moody's and Weiss. Standard & Poor's and A.M. Best are considered the lead agencies, in terms of insurer financial strength ratings, based on recognition and coverage.

The rating agencies produce interactive or public data ratings. Interactive data rating is based on meetings with companies' management and involves full analytical access to provide an in-depth evaluation of a number of factors including, but not limited to, operating performance, balance sheet's strength and business profile. Public data ratings reflect a quantitative and qualitative analysis utilizing publicly available information only.

Rating agencies utilize different methodologies and rating codes also differ. An "A" from one rating service does not necessarily equate to an "A" from another rating service. For instance, an "A" rating from A.M. Best is an "excellent" rating, while an "A" rating from Moody's is only "good".

The ratings can be classified into secure and vulnerable categories however, providing a gauge of a company's ability to meet its obligations. The highest rated "Secure" companies have a very strong ability to meet their ongoing obligations to policyholders while the lowest rated "Secure" companies have a good ability. Based on studies carried out by the agencies higher ratings generally correspond to lower default ratios.

Table 9 shows the four key agencies which rate the financial strength of insurance companies and their rating methodology. Plus or minus signs following the ratings show relative standing within the rating category. The shaded area in the table represents "Secure" category ratings.

In the case of the State of Minnesota, the surety must be licensed to do business in the State. It is also strongly recommended that the surety has a current A.M. Best Rating of A- or better, or a Standard & Poor's insurer's financial strength rating of A or better and classified as a Financial Size Category (FSC) of IX or greater (adjusted policyholders' surplus of $250 million or better). The FSC provides an indicator of the company's financial capacity to provide the necessary policy limits to insure risks.

More detailed credit ranking criteria to evaluate insurance and bonding companies can be found at A.M. Best's "Best Credit Ratings"[3]. The US Treasury Department maintains a list of approved sureties called Circular 5[4] that the State may want to use as a reference to evaluate PolyMet's surety bond proposal. The Bureau of Land Management also has a list of approved sureties.

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[3] A.M. Best website (http://www3.ambest.com/ratings/default.asp)

[4] Circular 5 (https://www.fiscal.treasury.gov/fsreports/ref/suretybnd/c570.htm)

**Table 9. Insurance company financial strength ratings by agency**

| A.M. Best | | Fitch | | Moody's | | S&P | | Weiss | |
|---|---|---|---|---|---|---|---|---|---|
| A++ | Superior | AAA | Exceptionally strong | Aaa | Exceptional | AAA | Extremely strong | A+ | Excellent |
| A+ | Superior | AA+ | Very strong | Aa1 | Excellent | AA+ | Very strong | A | Excellent |
| A | Excellent | AA | Very strong | Aa2 | Excellent | AA | Very strong | A- | Excellent |
| A- | Excellent | AA- | Very strong | Aa3 | Excellent | AA- | Very strong | B+ | Good |
| B++ | Very good | A+ | Strong | A1 | Good | A+ | Strong | B | Good |
| B+ | Very good | A | Strong | A2 | Good | A | Strong | B- | Good |
| B | Fair | A- | Strong | A3 | Good | A- | Strong | C+ | Fair |
| B- | Fair | BBB+ | Good | Baa1 | Adequate | BBB+ | Good | C | Fair |
| C++ | Marginal | BBB | Good | Baa2 | Adequate | BBB | Good | C- | Fair |
| C+ | Marginal | BBB- | Good | Baa3 | Adequate | BBB- | Good | D+ | Weak |
| C | Weak | BB+ | Moderately weak | Ba1 | Questionable | BB+ | Marginal | D | Weak |
| C- | Weak | BB | Moderately weak | Ba2 | Questionable | BB | Marginal | D- | Weak |
| D | Poor | BB- | Moderately weak | Ba3 | Questionable | BB- | Marginal | E+ | Very weak |
| E | Regulatory supervision | B+ | Weak | B1 | Poor | B+ | Weak | E | Very weak |
| F | In liquidation | B | Weak | B2 | Poor | B | Weak | E- | Very weak |
| S | Rating suspended | B- | Weak | B3 | Poor | B- | Weak | F | Failed |
| | | CCC+ | Very weak | Caa1 | Very poor | CCC+ | Very weak | | |
| | | CCC | Very weak | Caa2 | Very poor | CCC | Very weak | | |
| | | CCC- | Very weak | Caa3 | Very poor | CCC- | Very weak | | |
| | | CC/ C | Very weak | Ca | Extremely poor | CC | Extremely weak | | |
| | | DDD/ DD/ D | Distressed | C | Lowest | R | Regulatory supervision | | |

Note: Shaded area in the table represents "Secure" category ratings