

# PolyMet Mining Corp.

Low-cost polymetallic development project

Initiation of coverage

Metals & mining

PolyMet Mining Corp's initial investment case rests on its ability to secure environmental permitting for its NorthMet Project, arrange financing and complete construction on time and within budget. PolyMet purchased the Erie Plant and associated infrastructure for a fraction of the replacement cost, which positions the project at a low capital and operating cost relative to its peers. PolyMet's valuation has material upside if it expands its capacity or uses its infrastructure to consolidate the Duluth Complex in Minnesota. Our base case valuation is US\$479m or US\$1.32/share on a diluted basis. Our upside valuation, based on potential plant expansion to 90ktpd, is US\$1,254m or US\$3.08 per share (diluted).

Year end	Revenue (US\$m)	PBT* (US\$m)	EPS* (US\$)	DPS (US\$)	P/E (x)	Yield (%)
01/12	0.0	(3.1)	(0.02)	0.0	N/A	N/A
01/13	0.0	(4.5)	(0.02)	0.0	N/A	N/A
01/14e	0.0	(6.1)	(0.03)	0.0	N/A	N/A
01/15e	0.0	(10.0)	(0.03)	0.0	N/A	N/A

Note: \*PBT and EPS are normalised, excluding intangible amortisation, exceptional items and share-based payments.

## Low-cost development property with strategic advantage

PolyMet's strengths are: its location in the Mesabi Iron Range with its supporting infrastructure; the Erie Plant's scalability and capacity; the size of the NorthMet deposit; the world-class scale of the Duluth Complex; its first mover advantage; Glencore's support (technical, marketing and financial); the geopolitical stability of its location; and the breadth and experience of its management.

## Permitting and financing key sensitivities

Exploration- and development-stage mining companies have permitting, geologic, commodity price, access-to-capital and execution risk. There could be delays in receiving environmental permits. The financial market may not be accommodating and there is a risk the project may not be finished on time and within budget.

## Valuation: Base case US\$479m

Our base case valuation based on Phase I is US\$479m or US\$1.49/share undiluted. This dilutes to US\$1.32/share assuming US\$100m in equity is raised at US\$0.85/share. We assume a US\$450m capital cost financed with US\$350m in debt and US\$100m in equity. We have analysed the impact of two follow-on projects: expansion of NorthMet to 90,000t/d and Phase II. Our valuation based on expansion to 90,000t/d at a US\$400m capital cost is US\$1,254m (US\$3.89/share undiluted or US\$3.08/share diluted). Our calculations indicate Phase II does not add value. However, it provides operating alternatives that may be useful in negotiating pricing for concentrate sales.

21 November 2013

**Price** **US\$0.88**  
**Market cap** **US\$242m**

Net cash (US\$m) at 31 July 2013	13.4
Shares in issue	275.0m
Free float	70%
Code	PLM
Primary exchange	NYSE
Secondary exchange	TSX

## Share price performance



%	1m	3m	12m
Abs	13.9	8.1	(2.6)
Rel (local)	11.5	0.3	(24.1)
52-week high/low	C\$1.07	C\$0.69	

## Business description

PolyMet Mining Corporation is a junior mining company focused on developing the 100% owned copper-nickel-precious metals property in Minnesota. We look for it to secure its environmental permit by Q414 and complete construction by Q116.

## Next events

Environmental permits	Q414
Project construction completed	Q116

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*PolyMet Mining Corp. is a research client of Edison Investment Research Limited*

## Investment summary

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### **Company description: Low-cost polymetallic project nearing environment approval**

NYSE-listed PolyMet Mining is a junior mining company focused on developing its 100% owned NorthMet project in north-eastern Minnesota, US. Management is advancing the project to permitting and we expect the PolyMet team to build the mine. NorthMet includes a large copper-nickel-precious metals ore body, and the Erie Plant and tailings pond. Management hopes to secure environmental permits by Q414 and complete construction by Q116. The NorthMet Project, benefits from PolyMet's ownership of the Erie Plant and an associated tailings pond, which we believe reduces the capital cost and time to complete construction. Its strategic relationship with Glencore (a 28.6% owner of PolyMet) should help it raise capital. NorthMet is a large polymetallic property, which should have a low operating cost. We look for management to create additional value through expanding capacity or consolidating the Duluth Complex. In addition, we believe PolyMet might be able to optimize NorthMet's ore processing rate while staying within the permitted emissions level.

### **Valuation: Polymetallic project with a low operating cost**

We use a DCF model to value PolyMet's equity. Our base case valuation is US\$479m or US\$1.49/share undiluted or US\$1.32/share diluted. Our DCF valuation uses a 10% discount rate, a 20-year mine life and long-term price assumptions of US\$2.96/lb for copper and US\$10.14/lb for nickel. We assume a US\$450m capital cost with US\$100m financed with equity at US\$0.85/share and US\$350m funded with debt. No value is ascribed to the unused resource. Our upside valuation, based on an expansion to 90,000t/d at an additional capital cost of US\$400m, is US\$1,254m or US\$3.89/share undiluted or US\$3.08/share diluted.

### **Financials: Strong balance sheet, Glencore strategic relationship**

PolyMet has a strong balance sheet with US\$49m in cash as of 31 July 2013 and US\$35m in debt. It completed a rights offering July 2013, which raised US\$58m. Management projects its cash level at US\$37m by calendar year end 2013. Its cash should carry PolyMet through the permitting process. Spending is projected at US\$13m during second half of fiscal 2013, with US\$7.3m directed at securing environmental permits. The January 2013 technical report projected NorthMet Phase I capital spending at US\$312m, which we estimate at US\$450m adjusted for scope changes and inflation. We assume PolyMet will finance the project with a net US\$100m in equity and US\$350m in debt at 9% interest. We believe Glencore will help secure the debt financing.

### **Sensitivities: Permitting is key**

The important issues facing PolyMet are: permitting, geology, commodity pricing, access to capital and project execution. Based on company guidance we expect NorthMet to receive its environmental permits by December 2014. The timing of securing its permits is likely to affect the shares' value. There is a risk the geology is more challenging than the engineering studies predict and commodity pricing will also affect the share price. We assume PolyMet will have to raise a net US\$100m in equity and US\$350m in debt over the next 10 quarters. This could be an issue if capital markets are not accommodating. There is also a risk the project could run over budget or be completed late. The amount of existing equipment and level of engineering work that has already been done will tend to mitigate these risks.

## Company description: Junior mining company

PolyMet is a junior development mining company focused on developing the 100% owned NorthMet copper-nickel-precious metals project in the established Mesabi Iron Range of north-eastern Minnesota (Exhibit 1). Management has been working on securing environmental approval to build the NorthMet project for a number of years. It anticipates securing environmental approval to initiate construction of the project by the end of calendar year 2014. Construction should take 12-18 months, with the project being completed in the first calendar quarter of 2016. PolyMet acquired the Erie Plant from Cliffs Natural Resources in transactions in 2005 and 2006 for US\$32m. This materially reduces the capital cost to build NorthMet and shortens the required construction time. NorthMet will start with a volume of 32,000t/d (short tons), but historically the plant operated at 100,000t/d and we believe an operating rate of at least 90,000t/d should be attainable. Initially in Phase I it will produce and market a copper concentrate and a nickel concentrate. In Phase II, which is being permitted, it would process the nickel concentrate through an autoclave, resulting in production and sale of high-grade copper concentrate, value-added nickel-cobalt hydroxide and precious metals precipitate products. Based on our calculations Phase II would not add value.

**Exhibit 1: NorthMet location**



Source: PolyMet

## NorthMet project development

Construction is slated to start on receipt of environmental permits, which we believe will be by December 2014, and availability of construction financing. NorthMet will be developed as an open-pit mine, starting with the East Pit, followed by both the East Pit and larger West Pit. After the East Pit has been mined out, waste from the West Pit will be back filled into the East Pit. PolyMet will be an open-pit mine. Run of mine rock will be delivered to a loading system, loaded onto rail cars and delivered to the Erie Plant six miles to the west. PolyMet will mine approximately 32,000 tons of ore per day in Phase I. It will have a life of mine stripping ratio of 1.4 to 1.0, but will start out with a very low stripping ratio the first several years.

Waste rock with the lowest sulphur content will be placed in a stockpile with a ground water containment system. The remaining waste rock will be temporarily placed on foundations, liners and containment systems, then backfilled into the pit for underwater storage. Ore will be transferred from rail cars into crushers formerly used to crush iron ore. Once the ore is crushed to 0.5 inches it will be further ground in rod and ball mills, reducing it to 120 microns.

The finely ground ore will be sent to new flotation cells that will separate the metal-bearing rock concentrate from non-metal-bearing rock (tailings). The flotation circuit will produce separate

copper and nickel concentrates. Tailings will be collected from the flotation cells and sent to the existing tailings basin. Five years of testing have shown these tailings will not generate acid. The metals are separated into concentrate to be sold for further processing. The copper concentrate will be sold on benchmark terms. In Phase I both concentrates will be sold to Glencore under a long-term marketing agreement. In Phase I PolyMet should be paid for 96.5% of the copper and 90% of the gold in the copper concentrate and 70% of the nickel and 60% of the platinum group metals (PGMs) in the nickel concentrate. Initial annual production of Phase I is estimated at 72m pounds of copper, 15m pounds of nickel and 106,000 ounces of precious metals.

If PolyMet goes ahead with Phase II it will build an autoclave to process the nickel concentrate, which will produce a nickel-cobalt hydroxide and a precious metals precipitate. The autoclave would operate under similar conditions to the long-established gold circuit at Barrick Gold's Gold Strike mine in Nevada and the copper circuit at Freeport McMorRan Copper & Gold's Bagdad mine in Arizona.

Based on the economic summary in the 2013 updated 43-101 Technical Report, NorthMet will have a cash cost of US\$1.05 per pound of copper based on co-product economics and a negative cost of US\$0.28 per pound of copper based on byproduct economics.

### **The Erie Plant provides PolyMet with a competitive advantage**

The Erie Plant is a large grinding and milling facility with a tailings pond. The plant includes two rail dump pockets, two primary 60" gyratory crushers, eight secondary 36" gyratory crushers, seven tertiary standard cone crushers, 14 seven-foot short-head crushers, 30 mill circuits each comprising one 12' x 14' rod mill, one 12' x 14' ball mill, three 12' x 24' regrind mills and maintenance facilities. It also has conveyors, feeders, bins, auxiliary facilities and a 225MVA high-voltage electrical substation, with a water supply, road, tailings basins and rail facilities. It owns a 120-rail car fleet, locomotive fuelling and maintenance facilities, and water rights.

The Erie Plant operated from 1957 to 2001, processing taconite, and was shut down in the bankruptcy of its owner, LTV Steel Mining Company. The existing Erie Plant has a historic capacity of 100,000t/d, comprising four-stage crushing and 34 mill lines, each with a rod mill and ball mill.

Cliffs operated the plant on behalf of the owners, processing 100,000t/d of taconite ore. In the mid-1980s the consortium was consolidated into a single owner, LTV Steel. The plant is in good physical condition and operated at or near full capacity prior to its closure. PolyMet has not operated the plant, but has examined it in detail and believes the mill is serviceable.

PolyMet plans to use one of two primary crushers and one-third of its historic capacity (32,000t/d) to treat the material mined from the NorthMet deposit in Phase I. We believe management may optimise the potential of the plant in Phase I while staying within the permitted emissions level. We believe it could achieve a 20% to 30% increase in throughput while deploying minimal additional capital, which should enhance the project's economics. Under the Asset Purchase Agreement, PolyMet assumed certain ongoing site-related environmental and reclamation obligations of Cliffs related to the Erie Plant.

### **Phase II**

Phase II will further treat the milled nickel concentrate. The concentrate from the flotation cells will be put into a large pressure oxidation vessel called an autoclave. Oxygen will be added to create a chemical reaction with the nickel concentrate. Heat generated by the exothermic reaction and high pressure will drive the metals into solutions. Metals, including nickel, cobalt, platinum, palladium and gold, will be precipitated out of the solution and sold as semi-finished products: nickel-cobalt hydroxide and precious metal precipitate. Limestone will be added to the excess solution to neutralise acidity. This will create synthetic gypsum that will be stored in a lined facility.

## The NorthMet resource

The NorthMet copper-nickel-PGM ore body is near a number of shut-down iron ore mines and the operational Peter Mitchell open-pit iron ore mine is approximately one mile north. The NorthMet ore body comprises 275Mt of proven and probable reserves grading 0.79% copper equivalent with measured and indicated (M&I) mineral resources of 694Mt grading 0.74% copper equivalent (Exhibit 2). We believe the size and scope of the ore body could support a much larger project, which would create meaningful additional value.

**Exhibit 2: Mineral resources and reserves summary**

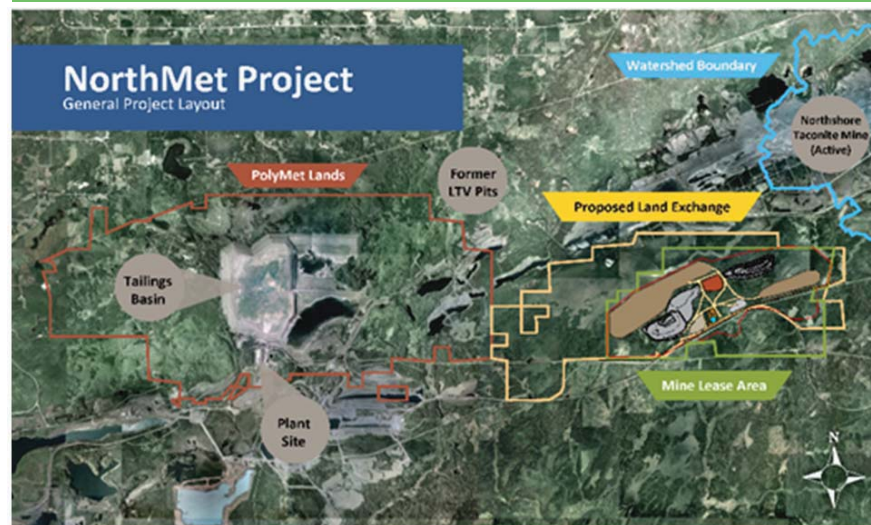
	Tonnage		Copper equivalent <sup>1</sup>		Copper	Nickel	Total precious metals	
	Million st	Million mt	(%)	Mlbs	(%)	(%)	(oz/st)	(g/mt)
<b>Global resource<sup>2</sup></b>								
Measured	234.4	212.6	0.73%	3,431	0.263%	0.077%	0.010	0.33
Indicated	654.2	593.5	0.63%	8,202	0.223%	0.066%	0.008	0.27
M + I	888.6	806.1	0.65%	11,633	0.234%	0.069%	0.008	0.29
Inferred	289.6	262.7	0.66%	3,813	0.246%	0.068%	0.009	0.32
<b>Total</b>	<b>1,178.2</b>	<b>1,068.8</b>	<b>0.66%</b>	<b>3,813</b>	<b>0.246%</b>	<b>0.068%</b>	<b>0.009</b>	<b>0.29</b>
<b>Mineral resources<sup>3</sup></b>								
Measured	202.5	183.7	0.79%	3,204	0.285%	0.083%	0.011	0.37
Indicated	491.7	446.1	0.72%	7,052	0.256%	0.075%	0.010	0.33
M + I	694.2	629.8	0.74%	10,255	0.264%	0.077%	0.010	0.34
Inferred	229.7	208.4	0.75%	3,455	0.273%	0.079%	0.011	0.37
<b>Total</b>	<b>923.9</b>	<b>838.1</b>	<b>0.74%</b>	<b>13,701</b>	<b>0.267%</b>	<b>0.078%</b>	<b>0.010</b>	<b>0.35</b>
Reserves	274.7	249.2	0.79%	4,340	0.284%	0.082%	0.011	0.38
Mine plan <sup>4</sup>	231.1	209.7	0.77%	3,565	0.273%	0.080%	0.011	0.38

Source: 12 October 2012 NI 43-101 by AGP Mining Consultants. Note: <sup>1</sup> Metals converted to copper based on 2008 DFS Update metal prices; <sup>2</sup> 0.1% copper cut-off; <sup>3</sup> US\$7.42/lb net metal value cut-off; <sup>4</sup> 20-year mine plan subject to permit applications; mt = metric tonnes, st = short tons.

## Potential resource expansion

We believe there is a good chance PolyMet will be able to expand the size of its resource by 50-100% based on what we learned on a site visit. The eastern end of the pit is cut off by the property boundary with the Teck-Mesaba project. However, down dip to the south and west the geology is open (Exhibit 3). Also, based on drill work to date there is a chance PolyMet will be able to identify economic mineralisation on the hanging wall and at depth.

**Exhibit 3: NorthMet project layout**



Source: PolyMet Mining



### Land swap details essentially complete

PolyMet owns the mining rights under the NorthMet property through perpetually renewable leases, but does not own the surface rights. PolyMet will complete a land exchange, which involves the United States Forest Service (USFS) transferring its surface rights to PolyMet for tracts of land totalling approximately 6,700 acres of forest, wetlands and lakes, with high recreational value. The land PolyMet will swap is subject to a US\$4m mortgage from the Iron Range Resources and Rehabilitation Board (IRRRB), an economic development agency with no regulatory oversight for mine permitting activities. We expect the land swap to be completed as the final environmental permits are issued to PolyMet. The loan will be paid off when the land swap is completed.

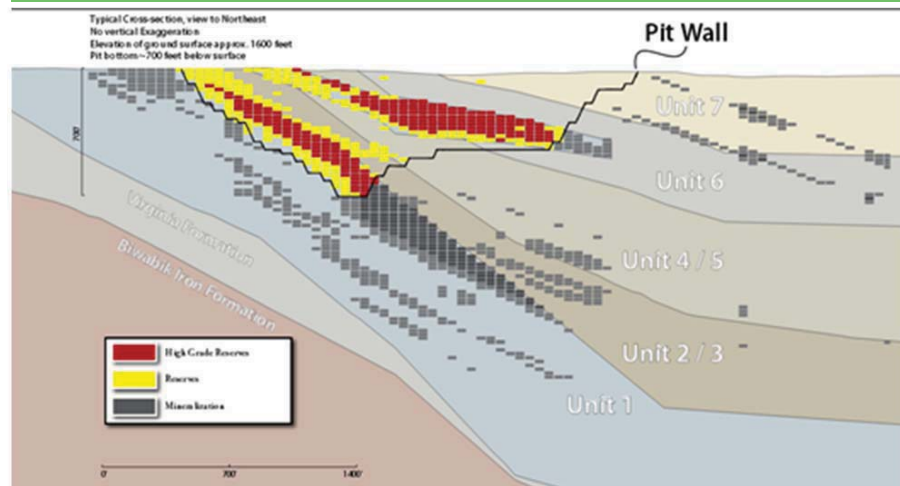
### Regional geology: The Duluth Complex of northern Minnesota

The NorthMet Deposit is in the Duluth Complex of northern Minnesota. This is a large, composite, grossly layered, tholeiitic mafic intrusion that was emplaced into comagmatic flood basalts along a portion of the Mesoproterozoic Midcontinent Rift System, along the western edge of the Duluth Complex, and within the Partridge River and South Kawishiwi intrusion. There are 11 known copper-nickel deposits, some of which contain platinum group elements. The NorthMet Deposit is within the Partridge River Intrusion, which consists of varied troctolitic and gabbroic rock types that have been subdivided into seven igneous stratigraphic units based on drilling core logging on the footwall. PolyMet is the only copper-nickel mining company with a mill and tailings pond in the area and may capitalize on its first-mover advantage to consolidate the Duluth Complex.

### NorthMet project geology

Geology at NorthMet is well defined by outcrop mapping and drill core logging on the US Steel holes (Exhibit 4). The broad picture is of a regular stratigraphy of troctolitic to anorthositic rock units. The basal ultramafic zones tend to have diffused tops, sharp bases and are commonly serpentinised and foliated. Geologists have generally picked the unit boundaries at the base of these ultramafics although there are local exceptions. Economic sulfide mineralisation is ubiquitous in the basal igneous unit and is locally present, but restricted in the upper units. There is no economic mineralisation in the footwall rocks.

**Exhibit 4: NorthMet cross-section**



Source: PolyMet Mining

## Mineralisation

The metals of interest at NorthMet are copper, nickel, cobalt, platinum, palladium and gold. The metals are positively correlated with copper mineralisation, with the exception of cobalt and gold. Cobalt is correlated with nickel.

## Glencore Xstrata relationship – a strategic advantage

PolyMet's relationship with Glencore is a major strategic plus for PolyMet. Glencore back stopped PolyMet's recent rights offering, has made a series of equity investments following the initial convertible debt investment and has signed an offtake agreement. We believe Glencore will be very helpful to PolyMet when PolyMet is raising money to fund the NorthMet project. To date Glencore has invested \$140m in PolyMet.

Since 31 October 2008 PolyMet and Glencore have entered into a series of financial transactions and negotiated a marketing agreement whereby Glencore Xstrata committed to purchase all of PolyMet's production of concentrates, metal or intermediate products on market terms at the time of delivery, for at least the first five years of production. This will involve shipping copper concentrate to Japanese smelters and PolyMet being paid on an LME basis on the date of delivery.

As part of the 2013 financing, PolyMet and Glencore entered into a corporate governance agreement. From 1 January 2014, as long as Glencore holds 10% or more of PolyMet's shares, Glencore has the right, but not the obligation, to designate at least one director and not more than the number of directors proportionate to Glencore's fully diluted ownership of PolyMet. Glencore is not to exceed 49% of PolyMet's board members.

Glencore currently owns 78.7m shares or 28.6% of PolyMet's issued shares. It also owns US\$25m of floating-rate secured debentures due 20 September 2014, or US\$31m including capitalised interest. Including capitalised interest as of 31 July 2013, these debentures are exchangeable at US\$1.292 per share into 24.18m shares of PolyMet when PolyMet receives the permits necessary to start construction of NorthMet. Glencore also holds warrants to purchase 6.46m common shares at US\$1.30 per share at any time until 31 December 2015, subject to mandatory exercise if the 20-day value weighted average price of PolyMet common shares is equal to or greater than 150% of the exercise price and PolyMet provides notice to Glencore that it has received environmental permits. If Glencore exercised all its rights and obligations under these agreements, it would own 109.4m common shares of PolyMet, representing 33.9% on a fully-diluted basis.

## History

The NorthMet ore body is located south of the eastern end of the historic Mesabi Iron Range in north-eastern Minnesota. Mining in the Iron Range dates back to the 1880s when high-grade iron ore known as hematite was first mined commercially. During the 1950s when hematite reserves began to dwindle, the iron ore industry began to focus on taconite, a lower-grade iron ore. The Erie Plant was one of several built during the 1940s and 1950s to mine taconite. It was acquired by PolyMet in November 2005.

During the 1940s, copper and nickel were discovered near the iron range. U.S. Steel drilled what is now the NorthMet ore body, but considered the deposit uneconomic due to its inability to separate copper and nickel and the lack of a market for PGMs. In 1987, the Minnesota Natural Resource Institute published data suggesting it was possible there might be a large resource of PGMs in the Duluth Complex. In 1989 PolyMet acquired a 20-year renewable mining lease on the property from US Steel and started investigating the potential of mining for copper, nickel and PGMs.

In July 2000, PolyMet entered into a joint venture arrangement with North Limited to advance NorthMet into commercial production. North Limited had the right to earn an 87.5% interest in the

NorthMet Project. Rio Tinto acquired North Limited in 2010 and decided not to proceed with the project.

PolyMet commissioned a pre-feasibility study on the project, which was completed in 2001. The study found the NorthMet returns unacceptably low due to the cost of capital and depressed commodity prices. No additional work was done until March 2003, when new management took over PolyMet. The new management believed the acquisition of the Erie Plant had the potential to materially reduce the capital necessary to develop the project and simplify the permitting process.

PolyMet and Cliffs signed an MOU February 2004 covering an option to acquire the mill. In November 2005 PolyMet completed the early exercise of its option with Cliffs Natural Resources to acquire the Erie Plant. It paid Cliffs US\$1m in cash, 6.2m of its common shares and commenced payments of US\$250,000 starting on 31 March 2006 for a total of US\$2.4m.

The most current report issued by PolyMet is the NI 43-101 Technical Report issued on 13 January 2013, which uses information from the February 2008 report.

### **Environmental permitting expected by calendar year end 2014**

Based on management guidance, we believe PolyMet should receive its environmental permits by the end of calendar year 2014. The NorthMet Supplemental Draft Environmental Impact Statement (SDEIS) is expected to be published in the Federal Register and Minnesota Environmental Quality Board Monitor early December 2013. Publication launches a public review for at least 45 days – management thinks the regulators will likely extend this to 90 days, which would be completed in early March 2014. Comments will be reviewed by the State of Minnesota and PolyMet and relevant comments will be incorporated into the Final EIS, which is expected to be completed between August and November of 2014. The final EIS forms the legal basis for issuing permits. The lead agency for processing PolyMet's environmental permitting is the Minnesota Department of Natural Resources (MDNR).

### **History of environmental effort**

PolyMet began the environmental review and permitting process in early 2004. In October 2005, the MDNR published its Environmental Assessment Worksheet Decision Document establishing it as the lead state agency and the US Army Corps of Engineers (USACE) as the lead federal agency for preparing an EIS for the NorthMet project. In 2006 the lead agencies selected an independent environmental contractor to prepare the EIS. Several other government agencies (including tribal governments) joined the team as cooperating agencies, bringing their expertise to the process.

In January 2007 PolyMet submitted a detailed project description (DPD) to state and federal regulators. The DPD laid out PolyMet's development plans and proposed environmental safeguards including a mine plan, a wetland mitigation plan, air and water quality monitoring plans and a closure plan.

A draft EIS identifies the environmental impact of a proposed project and evaluates alternatives and ways to mitigate potential impacts. The EIS contractor prepared a series of preliminary versions of the draft EIS that were reviewed and commented on by the lead agencies, other government agencies and PolyMet.

In November 2009, the lead agencies published the PolyMet draft EIS, which started a 90-day period for public review and comment that ended on 3 February 2010. During this period, the lead agencies held two public meetings and received more than 3,700 submissions containing approximately 22,000 separate comments, including an extensive comment letter from the US Environmental Protection Agency (EPA). The EPA criticised the way the draft EIS had been prepared, including that it did not state which of the alternative plans was being proposed.



On 25 June 2010 the co-lead agencies announced they intended to complete the EIS process by preparing a supplemental draft EIS, or SDEIS that incorporated a land exchange proposed with the USFS Superior National Forest and expanded government agency cooperation. The USFS joined the USACE as a federal co-lead agency through the completion of the EIS process. The MDNR remained the state co-lead agency.

On 13 October 2010 the USACE and the USFS published a notice of intent to complete the SDEIS, which:

- supplemented and superseded the draft EIS and responded to concerns identified by the EPA and other comments on the draft EIS; and
- incorporated potential effects from the proposed land exchange between the USFS Superior National Forest and PolyMet.

In July 2011, the EPA became a cooperating agency alongside three Minnesota Chippewa bands. The Minnesota Pollution Control Agency is actively involved in the process, leading to its role in permitting co-cobalt hydroxide and precious metals precipitate products.

The SDEIS gave PolyMet an opportunity to modify the project plan, including initially selling copper and separate nickel-rich concentrates (Phase I) and a smaller Hydromet plant (Phase II) processing only the nickel-rich concentrate. Previous plans included a second autoclave and a copper solvent extraction/electro-winning circuit to produce copper metal with nickel-cobalt hydroxide and precious metals precipitate products. Advantages include a better return on capital investment, reduced financial risk, lower energy consumption, and reduced waste disposal and emissions at site.

A preliminary (or draft) SDEIS was completed in May 2013 and made available for review by cooperating agencies. Comments from the cooperating agencies have been received and incorporated into the formal SDEIS. On 6 November 2013 the MDNR announced that the 1,800-page NorthMet SDEIS will be available for public review on 6 December 2013 when it will be published in the Federal Register. It will then be published in the Minnesota Environmental Quality Board Monitor on 9 December 2013.

After publication of the SDEIS, Federal regulators require a minimum of 45 days for public comment with at least one public meeting. Management believes this could last 90 days and be completed by early March 2014. All comments have to be reviewed and assessed by the State of Minnesota and PolyMet. Management projects this could be a three to six month process completed between June and September 2014. Public comments that the co-lead agencies consider material will be incorporated into the final EIS to be published within one to two months, which would be August to November 2014. The final EIS is the basis for a Federal Record of Decision by the Federal agencies and the Adequacy Decision by the MDNR, which are the legal basis for issuance of permits.

The major permits are:

**US Army Corps of Engineers**

- Section 404 Individual Permit for Impacted Wetlands

**Minnesota Pollution Control Agency**

- National Pollutant Discharge Elimination System (NPDES) Permit (storm water)
- State Disposal System (SDS) Permit
- Air Emission Permit

**Minnesota Department of National Resources**

- Permit to Mine
- Water Appropriations Permit

- Dam Safety Permit
- Wetlands Replacement Plan

### **Potential follow-on projects**

There are three potential follow-on projects that we will discuss:

1. expansion of the project to 90,000t/d
2. processing third-party ore
3. construct Phase II

We believe the most likely follow-on project PolyMet will pursue is the expansion of mining and milling to 90,000t/d, with the second most likely third-party ore processing of 50,000t/d or 100,000t/d.

#### **Expansion to 90,000t/d**

Phase I is designed to operate at 32,000t/d, which uses 32% of the Erie Plant capacity. Based on rule-of-thumb estimates, the capital cost of expanding to 90,000t/d would be approximately US\$400m. Expansion would require additional environmental review and permitting. We have assumed it would take two years to secure permits and one year to expand the mine to 90,000t/d and update the mill. It operated at 100,000t/d previously, so a 90,000t/d rate would leave a 10% cushion; the NorthMet deposit is large enough to support the larger capacity. We assume PolyMet would restructure its debt to fund the capital for the project and that it would begin working on permitting the expansion project within six months of receiving its permits for Phase I. On this basis it could complete its expansion by Q218.

#### **Third-party processing**

There are roughly 11 mineral properties within shipping distance of PolyMet's mill. We believe there is a good chance PolyMet will decide to toll process third-party ore or form some relationships with one or more the local projects. We believe government permitting agencies may encourage the developers of other mining properties in the area to work out an arrangement with PolyMet to use its pre-existing mill and tailings pond. This would limit the footprint of mining and processing in the area. Like the expansion case, we believe it would take two years to permit the expansion of the mill and one year to complete the mill modernisation. But since we do not know the grade of the ore to be toll processed or its metal composition we cannot model the potential contribution a third party relationship may have. We believe eventually the copper-nickel-PMG properties in the Duluth Complex that are close to the Erie plant facility may consolidate under PolyMet.

#### **Phase II**

PolyMet's Phase II project, which will be permitted at the same time as Phase I, would process the nickel concentrate through a single autoclave, resulting in production and sale of high-grade copper concentrate, value-added nickel-cobalt hydroxide and precious metals precipitate products. The capital cost of Phase II was estimated at US\$163m in the 2013 update NI 43 101 Technical Report. We estimate the capital cost at US\$200m in current dollars with construction taking two years.

### **Valuation**

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We value PolyMet Mining using DCF valuations for the NorthMet project and corporate overheads, adjusting for cash, option and warrant exercise and debenture conversion. No value is ascribed to the resource that is not included in the 20-year mine plan, but we consider upside scenarios which include additional resource in the mine plan.

Our base case valuation is US\$479m or US\$1.49 per share undiluted, based on Phase I of the simplified operating plan reported in February 2011. Assuming US\$100m of equity is issued in Q415 at a notional US\$0.85/share issue price to fund the equity component of the project construction capital expenditure, our base case valuation would be diluted to US\$1.32 per share.

We consider two upside scenarios:

- potential future expansion of throughput to 90,000t/d; and
- Phase II of the simplified operating plan reported in February 2011.

Our upside valuation, based on potential future expansion of permitting to 90,000t/d, is US\$1,254m equating to US\$3.89 per share undiluted and US\$3.08 per share diluted at a notional issue price of US\$0.85. Phase II does not add value under our current economic assumptions, although it could provide modified product that may be useful in negotiating pricing for concentrate sales.

## Base case valuation

Our DCF valuation of the NorthMet project is based on a 10% discount rate and long-term copper and nickel prices of US\$2.96/lb and US\$10.14/lb respectively.

**Exhibit 5: Base case sum-of-the-parts valuation analysis**

	Total NPV	Per share	% of total
	US\$m	US\$	NPV
NorthMet project NPV – Phase I	454	1.41	95%
Corporate overheads NPV	(55)	(0.17)	-11%
Base EV	399	1.24	83%
Net (debt)/cash at 31 July 2013	13	0.04	3%
Stock option exercise	25	0.08	5%
Warrants exercise	11	0.03	2%
Convertible debenture conversion	31	0.10	7%
Total attributable NPV	479	1.49	100%
Shares in issue	274,961		
Convertible debenture dilution	24,177		
Stock options in issue	15,120		
Warrants	8,169		
Diluted shares in issue	322,427		

Source: Edison Investment Research

Key assumptions for the Phase I base case scenario include:

- US\$450m initial capital expenditure
- US\$9.77/ton operating costs
- Variable 3% to 5% royalty dependent on net metal value
- 32ktpd plant throughput
- 20-year mine life
- 240Mt ore processed over the mine life, representing 88% of reported reserves
- Higher-grade ore processed in the first four years – 32ktpa Cu, 7ktpa Ni peak production
- Steady state production – 26ktpa Cu, 6ktpa Ni

## Dilution analysis – base case valuation

We estimate that PolyMet will need to raise US\$100m in equity in the fiscal fourth quarter of 2015 to fund the equity component of the US\$450m Phase I project construction capital expenditure. This is included in our FY15 forecasts assuming an issue price of US\$0.85/share. We anticipate conversion of the US\$25m convertible debenture plus capitalized interest on maturity in September 2014. The dilutive impact on our valuation of US\$100m of equity being raised depends on the assumed issue price.

<b>Exhibit 6: Base case valuation dilution analysis</b>								
Notional issue price	US\$	0.70	0.75	0.80	0.85	0.90	0.95	1.00
Shares in issue	m	322.4	322.4	322.4	322.4	322.4	322.4	322.4
Pre-funding valuation	US\$m	479.1	479.1	479.1	479.1	479.1	479.1	479.1
Assumed gross funding requirement	US\$m	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Shares to be issued	m	142.9	133.3	125.0	117.6	111.1	105.3	100.0
Shares in issue post funding	m	465.3	455.8	447.4	440.1	433.5	427.7	422.4
Post-funding valuation	US\$m	579.1	579.1	579.1	579.1	579.1	579.1	579.1
Diluted valuation per share	US\$	1.24	1.27	1.29	1.32	1.34	1.35	1.37

Source: Edison Investment Research

### Base case valuation sensitivity

The project is leveraged to changes in commodity prices. In this section we analyze the impact of changes in our assumptions. In Exhibit 7 we analyze the impact of a US\$0.25 per pound change in the price of copper and a US\$1.00 per pound change in the price of nickel.

<b>Exhibit 7: NorthMet project – base case valuation sensitivities (US\$/share)</b>						
Copper price, US\$/lb	2.45	2.70	2.96	3.20	3.45	
Valuation per share	1.01	1.16	1.32	1.45	1.60	
Nickel price, US\$/lb	8.15	9.15	10.14	11.15	12.15	
Valuation per share	1.14	1.23	1.32	1.39	1.48	

Source: Edison Investment Research

In Exhibit 8, we consider the sensitivity of our base case valuation to the equity funding requirement and the discount rate applied in our DCF.

<b>Exhibit 8: Base case valuation sensitivity (US\$ per share)</b>							
Equity funding	Discount rate						
	6.0%	8.0%	10.0%	12.0%	14.0%	16.0%	
0	2.51	1.92	1.49	1.15	0.90	0.70	
50	2.25	1.76	1.39	1.11	0.89	0.72	
100	2.06	1.64	1.32	1.07	0.89	0.74	
150	1.92	1.54	1.26	1.05	0.88	0.75	
200	1.81	1.47	1.22	1.03	0.88	0.76	

Source: Edison Investment Research

Based on the current share price, the market implied discount rate is around 15%.

### Upside case valuation

We consider the valuation impact of two upside scenarios.

#### Potential future permitting of throughput expansion up to 90,000t/d

We assume PolyMet would begin working on permitting the expansion to 90,000t/d within six months of receiving its permits for Phase I, permitting would take two years and construction would take one year. On this basis, it could complete its expansion by May 2018. We assume that the additional US\$400m expansion capital expenditure would be funded partly from internal cash flow and partly debt-funded. This generates US\$775m additional value (net of increased corporate costs), adding 160% to our base-case valuation to give US\$1,254m total attributable NPV, equal to US\$3.89 per share undiluted and US\$3.08 per share diluted at a notional issue price of US\$0.85.

#### Phase II of the simplified operating plan reported in February 2011

Based on US\$200m estimated additional capital expenditure, 32,000t/d throughput, US\$11.00/t operating costs, and the anticipated higher metal payability from the sale of value added nickel-cobalt hydroxide and precious metals precipitate products, Phase II does not enhance our estimated valuation, so we do not expect Phase II to be built based on current economic

assumptions. However, it does provide operating alternatives that may be useful in negotiating pricing for concentrate sales.

#### Exhibit 9: Upside case sum-of-the-parts valuation analysis

	Total NPV	Per share	% of total
	US\$m	US\$	NPV
NorthMet project NPV – Phase I	454	1.41	36%
Phase I expansion – 90ktpd throughput	816	2.53	65%
Corporate overheads NPV	(96)	(0.30)	-8%
Base EV	1,174	3.64	94%
Net (debt)/cash at 31 July 2013	13	0.04	1%
Stock option exercise	25	0.08	2%
Warrants exercise	11	0.03	1%
Convertible debenture conversion	31	0.10	2%
<b>Total attributable NPV</b>	<b>1,254</b>	<b>3.89</b>	<b>100%</b>
Shares in issue	274,961		
Convertible debenture dilution	24,177		
Stock options in issue	15,120		
Warrants	8,169		
Diluted shares in issue	322,427		

Source: Edison Investment Research

#### Expansion to 90,000t/d

Key assumptions for the upside case scenario include:

- US\$450m initial capex; US\$400m expansion capex
- US\$9.77/t operating costs
- Variable 3% to 5% royalty dependent on net metal value
- 20-year mine life
- Ramp-up to 90,000t/d plant throughput in year three of mine life
- 630Mt ore processed over mine life, representing 91% of reported M&I resource
- Higher grade ore processed in first four years – 90ktpa Cu, 20ktpa Ni peak production
- Steady state production – 72ktpa Cu, 16ktpa Ni production

#### Dilution analysis – upside case valuation

The estimated US\$100m equity funding requirement and the share dilution are unchanged from the base case valuation.

#### Exhibit 10: Upside case valuation dilution analysis

Notional issue price	US\$	0.70	0.75	0.80	0.85	0.90	0.95	1.00
Shares in issue	m	322.4	322.4	322.4	322.4	322.4	322.4	322.4
Pre-funding valuation	US\$m	1253.8	1253.8	1253.8	1253.8	1253.8	1253.8	1253.8
Assumed gross funding requirement	US\$m	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Shares to be issued	m	142.9	133.3	125.0	117.6	111.1	105.3	100.0
Shares in issue post funding	m	465.3	455.8	447.4	440.1	433.5	427.7	422.4
Post-funding valuation	US\$m	1353.8	1353.8	1353.8	1353.8	1353.8	1353.8	1353.8
Diluted valuation per share	US\$	2.91	2.97	3.03	3.08	3.12	3.17	3.20

Source: Edison Investment Research

#### Upside case valuation sensitivity

We consider the sensitivity of our upside case valuation to the equity funding requirement and the discount rate applied in our DCF.

**Exhibit 11: Upside case valuation sensitivity (US\$ per share)**

Equity funding US\$m	Discount rate					
	6.0%	8.0%	10.0%	12.0%	14.0%	16.0%
0	6.58	5.04	3.89	3.02	2.36	1.85
50	5.70	4.39	3.42	2.69	2.13	1.70
100	5.05	3.92	3.08	2.44	1.96	1.58
150	4.55	3.56	2.81	2.25	1.83	1.50
200	4.16	3.27	2.61	2.11	1.72	1.43

Source: Edison Investment Research

Based on the current share price, the market implied discount rate is around 23%.

## Financials

Our FY14 and FY15 earnings forecasts reflect ongoing development spending at the NorthMet project with completion of the permitting expected by the end of 2014. We forecast that the US\$58m raised through the rights offering on 5 July 2013 will provide sufficient working capital through to the end of fiscal FY15 and thus provide flexibility for the timing of the anticipated equity raising.

We forecast that PolyMet's operating expenses will continue at the Q214 run-rate of US\$1.4m per quarter during H214 and FY15. We forecast that capital expenditure will decline from the US\$8.2m in Q214 to US\$4.0m per quarter in H214, consistent with the average run-rate in FY13, and then decline to US\$2.5m per quarter in FY15, ahead of the expected commencement of project construction capital expenditure in Q4 fiscal 15.

### Strong balance sheet

PolyMet had US\$49m in cash and US\$35m in debt at 31 July 2013. US\$31m in convertible debt is owed to Glencore (including accrued interest) with a US\$1.29/share conversion price, bearing interest at 12-month Libor plus 4%. Conversion can be forced when PolyMet secures its environmental permits. US\$4m debt outstanding to the IRRRB is scheduled for repayment on completion of the land exchange, expected when final environmental permits are issued.

Prior to the completion of permitting, PolyMet will seek to secure production debt financing subject to receipt of key permits. In January 2013, PolyMet renewed its shelf registration and prospectus to issue up to US\$500m in debt and equity to fund NorthMet project construction and working capital.

### Cash flow

We forecast that PolyMet will burn cash at US\$5.4m per quarter through the second half of fiscal 2014, declining to US\$3.9m per quarter in FY15. Assuming that environmental permitting will be approved by calendar year end 2014, we forecast a US\$100m equity raising in fourth calendar quarter of 2015 to fund the equity component of the project's construction capital expenditure. The January 2013 technical report offers an estimated US\$312m capital cost for Phase I of the NorthMet Project, based on the 2008 update. Management estimates that cost inflation will increase the capital cost to US\$450m. We assume US\$350m of the project's US\$450m capital costs will be financed with debt with the existing assets providing security and the offtake agreement with Glencore providing additional comfort to lenders.



**Exhibit 12: Financial summary**

	US\$m	2012	2013	2014e	2015e
31-January		IFRS	IFRS	IFRS	IFRS
<b>PROFIT &amp; LOSS</b>					
Revenue		0.0	0.0	0.0	0.0
Cost of Sales		0.0	0.0	0.0	0.0
Gross Profit		0.0	0.0	0.0	0.0
EBITDA		(2.7)	(3.6)	(4.7)	(4.8)
Operating Profit (before amort. and except.)		(2.7)	(3.7)	(4.7)	(4.8)
Intangible Amortisation		0.0	0.0	0.0	0.0
Exceptionals		0.1	0.0	0.0	0.0
Other		(0.7)	(2.2)	(0.7)	(0.7)
Operating Profit		(3.4)	(5.8)	(5.4)	(5.5)
Net Interest		(0.4)	(0.8)	(1.4)	(5.1)
Profit Before Tax (norm)		(3.1)	(4.5)	(6.1)	(10.0)
Profit Before Tax (FRS 3)		(3.7)	(6.6)	(6.8)	(10.6)
Tax		0.7	0.0	0.0	0.0
Profit After Tax (norm)		(2.5)	(4.4)	(6.1)	(9.9)
Profit After Tax (FRS 3)		(3.0)	(6.6)	(6.8)	(10.6)
Average Number of Shares Outstanding (m)		160.4	178.9	235.8	299.2
EPS - normalised (US\$)		(0.02)	(0.02)	(0.03)	(0.03)
EPS - normalised and fully diluted (US\$)		(0.02)	(0.02)	(0.03)	(0.03)
EPS - (IFRS) (US\$)		(0.02)	(0.04)	(0.03)	(0.04)
Dividend per share (US\$)		0.0	0.0	0.0	0.0
Gross Margin (%)		N/A	N/A	N/A	N/A
EBITDA Margin (%)		N/A	N/A	N/A	N/A
Operating Margin (before GW and except.) (%)		N/A	N/A	N/A	N/A
<b>BALANCE SHEET</b>					
Fixed Assets		170.7	226.4	244.2	267.2
Intangible Assets		0.0	6.0	6.0	6.0
Tangible Assets		170.7	220.4	238.2	261.2
Investments		0.0	0.0	0.0	0.0
Current Assets		18.9	9.7	40.4	422.5
Stocks		0.0	0.0	0.0	0.0
Debtors		0.4	0.8	1.1	1.1
Cash		17.5	8.1	38.3	420.3
Other		1.0	0.8	1.0	1.0
Current Liabilities		(2.5)	(7.1)	(5.1)	(5.1)
Creditors		(2.5)	(7.1)	(5.1)	(5.1)
Short term borrowings		0.0	0.0	0.0	0.0
Long Term Liabilities		(54.7)	(86.1)	(83.8)	(398.7)
Long term borrowings		(32.7)	(34.5)	(36.1)	(350.0)
Other long term liabilities		(22.0)	(51.7)	(47.7)	(48.7)
Net Assets		132.4	142.9	195.8	285.9
<b>CASH FLOW</b>					
Operating Cash Flow		(3.0)	(1.1)	(6.9)	(4.7)
Net Interest		(0.0)	(0.0)	(0.1)	(4.1)
Tax		0.0	0.0	0.0	0.0
Capex		(19.6)	(16.3)	(21.1)	(55.0)
Acquisitions/disposals		3.5	(2.1)	0.0	0.0
Financing		30.7	10.1	58.4	100.0
Dividends		0.0	0.0	0.0	0.0
Net Cash Flow		11.6	(9.4)	30.2	36.1
Opening net debt/(cash)		25.8	15.2	26.4	(2.2)
HP finance leases initiated		0.0	0.0	0.0	0.0
Other		(1.0)	(1.8)	(1.6)	32.0
Closing net debt/(cash)		15.2	26.4	(2.2)	(70.3)

Source: PolyMet Mining, Edison Investment Research

Contact details		Revenue by geography					
First Canadian Place 100 King Street West, Suite 5700 Toronto, ON M5X 1C7 Canada +1 416 915 4149 www.polymetmining.com/		N/A					
CAGR metrics	Profitability metrics	Balance sheet metrics			Sensitivities evaluation		
EPS 2011-15e	N/A ROCE 14e	N/A	Gearing 14e	(1.1%)	Litigation/regulatory	●	
EPS 2013-15e	N/A Avg ROCE 2011-15e	N/A	Interest cover 14e	N/A	Pensions	○	
EBITDA 2011-15e	N/A ROE 2014e	N/A	CA/CL 14e	8.1	Currency	○	
EBITDA 2013-15e	N/A Gross margin 2014e	N/A	Stock days 14e	N/A	Stock overhang	○	
Sales 2011-15e	N/A Operating margin 2014e	N/A	Debtor days 14e	N/A	Interest rates	◐	
Sales 2013-15e	N/A Gr mgn / Op mgn	N/A	Creditor days 14e	N/A	Oil/commodity prices	●	
Management team							
<b>President and CEO: Jon Cherry</b>				<b>COO: Joe Scipioni</b>			
Jon Cherry is a professional environmental engineer with a BS in environmental engineering from Montana Tech. Jon has 25 years of experience in the mining industry, mainly within Rio Tinto. He has held executive positions in the mining industry related to environmental permitting, compliance and development. Jon joined PolyMet Mining in 2012 as president and CEO responsible for developing NorthMet into a producing mine.				Joe Scipioni has more than 30 years' experience in mining and plant processing. He worked at U.S. Steel's Minntac Mine, and as plant manager of the Keewatin Taconite operation. Joe joined PolyMet Mining in 2006 and is currently COO focused on operations at the NorthMet project. He earned his degree in civil engineering from the University of Minnesota.			
<b>CFO: Douglas Newby</b>				<b>Executive vice president environment and government affairs: Brad Moore</b>			
Douglas Newby has more than 30 years of experience in the mining industry. He was a top-ranked sell-side mining analyst for many years and has extensive project finance experience, having been involved in structuring gold loans, project financing and M&A. He joined PolyMet Mining in 2005 and is responsible for all aspects of the company's finances. He earned his BS in mathematics from Kings' College London.				Brad Moore has more than 25 years' experience in regulatory and government relations. He has worked for a number of state agencies, including the Minnesota Pollution Control Agency, the Minnesota Department of Natural Resources and the Minnesota Department of Commerce. Brad joined PolyMet Mining in 2011 and is responsible for the NorthMet project's environmental review and permitting process and its government and regulatory relations. Brad holds a BA in political science from St. Olaf College and a MA in public affairs from the University of Minnesota.			
Principal shareholders							(%)
Glencore Xstrata							28.6
Pioneer							1.0
Companies named in this report							
Barrick Gold (ABX)							
Cliffs Natural Resources (CLF)							
Freeport McMoRan Copper & Gold (FCX)							
Glencore Xstrata							
Rio Tinto (RIO)							

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