

# **Financial Analysis: Mary River Iron Ore Mine**

**The viability of current base operations  
vs possible expansion stages**



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## Summary

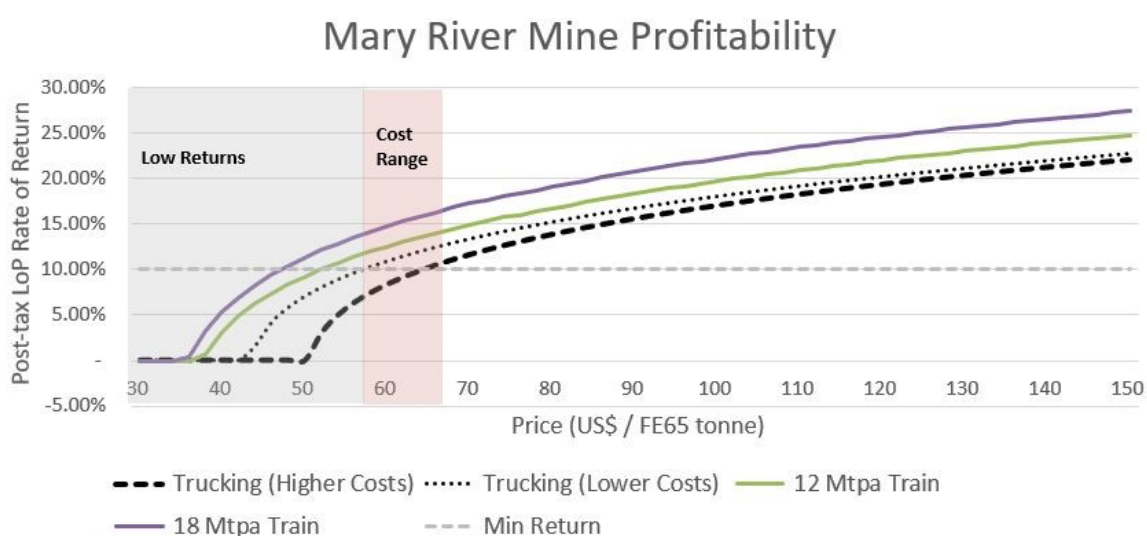
The main objectives of this report are to analyse the viability and profitability of trucking operations for Baffinland Iron Mines Corporation’s (BIMC) Mary River mine at the current rate of production and at a proposed higher rate of production, as well to assess the financial impact of railway expansions (Phase 2 and Phase 3).

This report relies on the company’s own data sources and analyzes more than 10 years of financial analysis and publications regarding cost structures, investments and profitability.

This report aims to serve as a resource to enable a fact-based discussion on the environmental impact assessment process through which BIMC seeks approval to produce and ship 12 MTPA from the Mary River mine by building a railway to Milne Inlet.

The main findings of the model at this stage are:

While claims by BIMC that a rail route to Milne Inlet would improve profitability are correct, a continued trucking operation is commercially viable, especially under market conditions at the end of 2020 which provide greater risk management opportunities (hedging). It is therefore not conclusive that expansion is necessary for the Mary River Mine to continue to be a viable operation. The high-grade quality of the Mary River ore achieves a premium price relative to iron ore benchmarks, therefore ensuring viability under spot prices in the market at any time in the past decade. Even under trucking operations, an internal rate of return of at least 10% could be achieved at as low as \$57<sup>1</sup> per tonne on the benchmark.



<sup>1</sup> Please note that all sums cited here are in US dollars, unless specifically stated to the contrary.

- There are significant gaps and uncertainties in the information in the public domain regarding the economics of the mine, especially surrounding a second capital phase apparently aimed at preparing the rail export to Milne Inlet before it had been formally approved, as well as related to the ongoing costs of a continued trucking operation.
- The decision to apply for a rail route to Milne Inlet rather than develop the already-approved southern route to Steensby Inlet has not been explained in light of the company's earlier rejection of a port at Milne Inlet because of its narrower seasonal shipping window. Steensby would still be a commercially viable export route, even assuming it was over a billion dollars more expensive than Milne Inlet, because of sunk costs.

This study was commissioned by the *Oceans North*. Its contents are the sole responsibility of the author and can in no way be taken to reflect the views and positions of Oceans North.

## Context

### Development adjustments

Situated on northern Baffin Island in Nunavut, Canada, the Mary River mine is an open-pit mine producing high-grade iron ore. The mine has been in commercial production since 2015. It is operated by BIMC<sup>2</sup> which is jointly owned by ArcelorMittal (25.7%) and Nunavut Iron Ore<sup>3</sup> (NIO - 74.3%).<sup>45</sup>

The original development plan for Mary River conceived of 18 million tonnes production per year (MTPA) from Deposit No.1 (one of nine deposits), to be shipped from the southern port of Steensby Inlet year-round.

In 2011, the controversial 150 km railway faced criticism from local communities and environmentalists<sup>4</sup> but the Nunavut Impact Review Board (NIRB) granted the approval. The company's own 2012 assessment of several export routes<sup>5</sup> laid out a lengthy examination of many potential rail routes. Baffin Island's northern and eastern ports, the report explained, must all be discounted because they allowed seasonal shipping of only 70-90 days a year and would be much less economically viable. The report then compared two possible routes to year-round ports, Steensby and Nuviut, and decided that Steensby, only half as far away from the mine as Nuviut, would be less environmentally harmful.

The following year, in 2013, BIMC's plans changed and the Nunavut Impact Review Board (NIRB) was asked to approve an *Early Revenue Phase Proposal (ERPP)* in an attempt to reduce costs and start production as quickly as possible. It consisted of a targeted production of 3.5 MTPA, transported by truck to the northern port of Milne Inlet.

The ERPP constitutes the base of operations at the time of this report (the end of 2020). Further negotiations took place in 2016/17 to allow expanded tonnage along the trucking route, which currently stands at about 6.6 MTPA. This expanded trucking option was negotiated as a temporary option before a rail route could be established.

BIMC's current stated plans for the mine still include Steensby as a future export terminal. In the meantime, the company started to invest in 2017 in a rail route to Milne Inlet running alongside the tote road, and has now developed two plans for expansion by this new rail

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<sup>2</sup> <https://www.baffinland.com/about-us/who-we-are/>

<sup>3</sup> <http://www.emgtx.com/about.html>

<sup>4</sup> Baffinland ownership composition has been changing progressively since 2011, mostly due to NIO constant increase in funding and consequently decrease of ArcelorMittal share.

<sup>5</sup> [https://www.cbc.ca/news/canada/north/baffin-communities-fight-steensby-inlet-port-plan-1.103763\\_3](https://www.cbc.ca/news/canada/north/baffin-communities-fight-steensby-inlet-port-plan-1.103763_3)

[https://s3.amazonaws.com/isuma.attachments/Baffinland\\_Final\\_Alternatives\\_Assessment\\_May2012.pdf](https://s3.amazonaws.com/isuma.attachments/Baffinland_Final_Alternatives_Assessment_May2012.pdf)

route. Company accounts suggest that over \$500 million were spent in the 2017-19 period on preparations for this expansion.

No explanation exists in the public domain as to why the company subsequently decided against building the railway to Steensby Inlet, given that land permissions for that route have already been given. Milne Inlet was rejected in 2012 by BIMC itself on the grounds that a short shipping window would make it unviable compared to Steensby. Yet the company's 2014 application to expand Milne Inlet was based on the idea that the season would be extended at that location for months by using ice-breakers, and petitioning for an exemption to rules which normally preclude this. This application was first rejected, and then subsequently accepted by the Nunavut Planning Commission.

The proposed expansion through Milne Inlet, called Phase 2, consists of building the railway and approval to extract 12 MTPA. This phase is currently under an environmental assessment review with the Nunavut Impact Review Board. The Phase 2 Hearing, which was adjourned and suspended in 2019 without completion, is scheduled for January/February 2021. According to ArcelorMittal financial statements, BIMC has already internally approved a Phase 3, which would further extend production to 18 MTPA, exported by the railway to Milne Inlet, and requiring \$1,385 million of capital investment in total.<sup>6</sup>

## **Costs perceptions and divergences**

There is uncertainty over whether the Mary River mine's current trucking operations are commercially viable.

Gary Vivian, for example, President of the Chamber of Mines for Canada's Northwest Territories and Nunavut, stated in 2019 that the mine required much larger production to be sustainable, and urged those involved in negotiations to reach a deal quickly.

"While Mary River is arguably the best iron ore deposit in the world, it is also in the worst location to be mined profitably. It needs a much better iron ore price, or much larger production levels, in order to achieve the economies of scale required to be sustainable in a highly competitive market and ultimately be profitable,"<sup>7</sup> he said.

On the other hand, BIMC's own published documents to investors<sup>8</sup> in 2018 suggest strong cost advantages in areas other than the transportation question.

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<sup>6</sup> Page 336 <https://corporate-media.arcelormittal.com/media/prse0kuz/annual-report-2019-1.pdf>

<sup>7</sup> <https://nunatsiaq.com/stories/article/iron-ore-mining-not-for-the-faint-of-heart-its-a-tough-business/>

<sup>8</sup> BIMC Preliminary Offering Circular, June 2018, p22 (pdf)

“Our low strip ratio, coupled with our geographic proximity to customers, results in low unit cash operating costs. In addition to requiring limited processing before sale, our reserves are located approximately 100 kilometers (60 miles) from our port, which is significantly closer than most of our competitors. The shipping distance from our Milne Inlet port to our primary customers in Europe is shorter than that of our competitors in Brazil and South Africa, improving further our relative cost position on a delivered basis.”

While rail-led exports would result in lower costs, it is not clear if continued trucking is itself commercially unviable, rather than simply offering a lower rate of return to the investor.

In order to document the issue and provide some light for further discussions, this study is based on the different financial analyses carried out by BIMC in the years leading to 2020, in which divergences can be observed. These are addressed in the model design (see *Model Assumptions*).

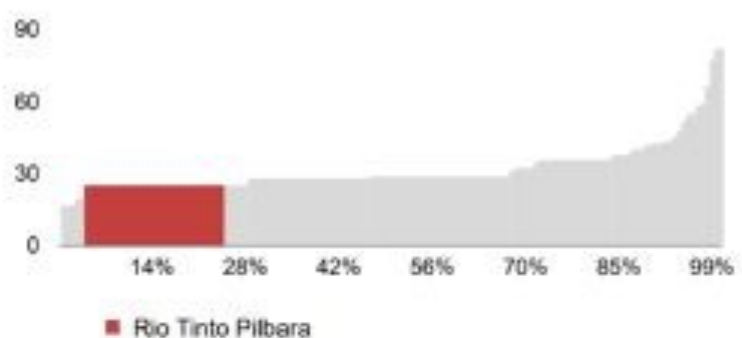
### Low-cost operations

On the one hand, the company claims to have “low unit cash operating costs” and a “large fixed cost structure.” However, its own Preliminary Offering Circular from 2018 indicates operating costs in around \$40- \$42 per tonne FOB and \$16- \$19 supplementary as ocean freight.

These values would position Mary River operations at the high end of the Iron cost curve (see graphic) and could suggest the mine is at a relative competitive disadvantage against global iron ore miners.

However, given the mine’s high-grade ore, BIMC has consistently achieved an average 21% premium price to the spot market price.<sup>8</sup> The iron ore prices have been consistently growing in the last five years and especially so during the Covid crisis.

**Steep Iron ore cost curve supports healthy margins for low cost producers**  
2019, CFR China Value in Use Adjusted Cash Cost \$/dmt



<sup>8</sup> Rio Tinto Iron Ore curve 2018

During December 2020, iron ore reached the \$152 mark.<sup>9</sup> Under such prices BIMC could achieve an average of \$183/tonne, leaving a 77% margin between the operating costs at port (FOB) and sale price.

### Fixed-cost structure

BIMC states it benefits "significantly from producing more tonnage at lower marginal costs" given a "relatively large fixed cost structure." However, estimated operating costs have varied substantially across their various financial analyses when analysing trucking operations.

The following table shows the operating costs (already adjusted by inflation) involving the same activities, showing a difference of 35%.

Trucking only operation				
	Early	Revenue	Phase	Base operations disclosed by
	Proposal	(2008 <sup>10</sup> )		Baffinland (2018)
Production		3.2 MT		4.6 MT
Operating costs per tonne (adjusted to 2020 values)		\$32.03		\$43.82 <sup>11</sup>

<sup>9</sup> <https://www.cnbc.com/2020/12/11/chinas-iron-ore-prices-spike-10percent-to-a-record-high-on-supply-concerns.html>

<sup>10</sup> Created in 2008 as preparing for the negotiations of 2013.

<sup>11</sup> BIMC Circular Offering 2018.

<sup>13</sup> Offering Circular 2018.



Minor differences in operating costs are also present when looking at operations supported by railway to Steensby Inlet and to Milne Inlet.

<b>Railway operation</b>		
	To Steensby Inlet (2010)	To Milne Inlet (2018)
Production	18 MT	18 MT
Operating costs (adjusted to 2020 values)	\$14.79	\$16.89 <sup>13</sup>

Expected capital costs have, however, followed similar lines.

## **The Global Iron Ore Market**

The iron ore market has evolved considerably over the last decade, since BIMC entered the first stage of capital development. Although iron ore prices are finishing the decade on record highs (with spot prices of \$160 per tonne achieved on the benchmark of CFR 62), miners have experienced price volatility over the last decade, as with other commodities.

Nevertheless, beyond normal market volatility, there have been several underlying trends over the last few years and indications of how they may develop in the 2020s. Some of these have direct relevance to analysing BIMC’s business case at the Mary River Mine.

### **Chinese domination of the market**

Although China was already the world’s largest importer of iron ore in 2010, Chinese ascendancy as the “swing consumer” continued throughout the decade until by 2020 it accounted for nearly 70% of all traded iron ore purchases. This suggests that iron ore prices are going to depend more narrowly on the Chinese economy than on a global economic outlook. The continued hunger of China’s steel industry for iron ore comes against a changing context of the Chinese economy as a whole, seeing faster growth in development of infrastructure, driven by an internal market, as compared to the export-dominated model of the last couple of decades. This suggests that Chinese demand for iron ore is likely to be more resistant to up-and-down swings in global economic confidence.

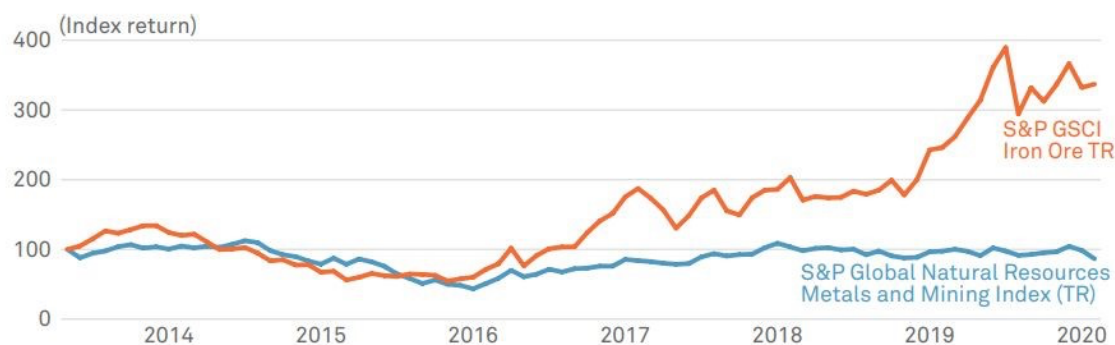
The needs of the Chinese market also suggest continued relative strength for iron ore produced at Mary River, since the premium on high grade iron ore is increasing in the Chinese market. This is because China’s own ore resources are deteriorating in quality as they have been “mined out.” The premium on pellet-form ore such as from Mary River compared to fine powder is also strong, playing to the fact that Mary River produces almost three quarters of its ore in pellet form.

## Financialisation

The second major structural change has been the “financialisation” of iron ore markets – the trading of futures, options, and other financial derivatives that are backed by iron ore in the same way as they were by oil in the 1980s.

In 2010, a minimal amount of iron ore was traded in financial instruments. Volumes of iron ore futures on the Singapore Exchange jumped by over 100 times from 2010 to the end of 2019<sup>12</sup> . But the Singapore exchange was itself eclipsed by the opening of a new financial market in iron ore futures at Dalian, within China, in 2013, whose volume of trading now exceeds Singapore by 10 to 1. This has led to considerable investment flows based directly on iron ore as a commodity, rather than as equity in the shares of companies that mine it.

### Iron ore futures performance vs metals and mining equities



Data from May 2013 to February 2020. Past performance is no guarantee of future results.  
 Chart is provided for illustrative purposes.  
 Source: S&P Dow Jones Indices LLC.

The growing financialisation of the market means that it is significantly easier to hedge physical supply at the end of 2020 than it was a decade ago, when the first plans for Mary River were drawn up<sup>13</sup> -- although the industry analytical firm Platts has suggested that mining companies have avoided hedging to allow their own shareholders to trade the share price against the spot market. It is also the product of much greater transparency around

<sup>12</sup> [Financialization through Futurization \(cnbc.com\)](https://www.cnbc.com)

<sup>13</sup> [Iron-ores-growing-appeal.pdf \(plattsinsight.com\)](https://www.plattsinsight.com) p6

the iron ore market that existed a decade ago, which in turn has led to tighter markets, and narrower spreads between bid and offer prices.

What these overall developments suggest is that whoever controls a major production asset such as the Mary River Mine is now able to modulate against severe price uncertainty on spot markets, in a way which was not possible even only a decade ago, when the Mary River project was conceived.

## Model Assumptions

### Production phases and operating costs

The model contemplates three future production scenarios -each one with a different cost structure as published by the company- and provides one option for users to test alternative scenarios. The model integrates the actual production rate of previous years and costs as reported by the company.

Future production scenarios and operating & sustaining costs structures are as follows:

Scenario	Explanation
<p style="text-align: center;"><b>Base</b></p>	<p><b>Production:</b> The model assumes 6.6 MTPA as base future production, from now until 2055.</p> <p><b>Costs:</b> Two cost scenarios, of high (\$40 per tonne plus shipping) and low (\$32 per tonne plus shipping)</p> <p><b>Transport to port:</b> Trucking.</p>
<p style="text-align: center;"><b>Constant</b></p>	<p><b>Production:</b> This option provides the user the possibility to test any given production rate, from now to 2033.</p> <p><b>Costs:</b> Two cost scenarios, of high (\$40 per tonne plus shipping) and low (\$32 per tonne plus shipping)</p> <p><b>Transport to port:</b> Trucking.</p>
<p style="text-align: center;"><b>Phase 2</b></p>	<p><b>Production:</b> 12 MTPA with a one-year ramp up period.</p> <p><b>Costs:</b> \$18 per tonne plus shipping.</p> <p><b>Transport to port:</b> Railway to Milne Inlet.</p>

<b>Phase 3</b>	<p><b>Production:</b> 18 MTPA with a two-year ramp up period.</p> <p><b>Costs:</b> \$17 per tonne plus shipping.</p> <p><b>Transport to port:</b> Railway to Milne Inlet.</p>
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A source consulted for the report estimated larger annual exports of 10.5 million tonnes would be challenging to achieve through Milne Inlet port due to shipping window constraints. According to Baffinland, the shipping window is currently 70 -90 days per year. It is unknown what BIMC would do to move any tonnage shortfall. The model assumes the export of 12 MTPA and 18 MTPA.

## Capital Costs

The model integrates capital costs the company has incurred up until now and projects future capital costs based on BIMC's projections in its 2018 Preliminary Offering. For either Phase 2 (12 MTPA) or Phase 3 (18 MTPA) the model assumes remaining capital expenditure would be split evenly between 2021 and 2022.

An alternative development of Steensby has been explored in the model by assuming an additional \$1.5 billion of capital would be needed to build the rail route from the mine south, and otherwise assumes the same operating costs as were presented for Milne Inlet in BIMC'S Offering.

## Sunk costs

The company has already invested in the expansion connected to its plans to build a railway to Milne Inlet, although approval has not been granted. By 2018, the company reported \$352 million in expenditures. The model projects at least \$527 million in expenditures by the end of 2020. These sunk costs are deducted from the future development budget.

For non-expansion scenarios, the model provides two options: one is to test the project viability including these sunk costs or, second, to test project viability excluding these costs (on the grounds these were made on an expansion plan not yet unauthorised). This option can be altered in the Dashboard by choosing between: BO only / BO and railway financing.

## Financing

BIMC's own financing has not been modelled, as the main objective is to analyse whether the operations are viable under Life of Project rate of return projections.

It may be that because of liquidity issues or onerous project finance loan repayments BIMC's own expected profits could differ from those projected by the model. But the key question for policy makers and local communities is to what extent they feel obligated to assure BIMC commercial viability beyond industry standard rates of return because of BIMC's own particular financial circumstances.

For reference, the following financing for BIMC has been documented.

Loan	Sum	Interest rate	Maturity	Details
Project Loan (Feb 2014) <sup>14</sup>	\$300m	Unknown	September 2018	On January 7, 2017, the Company made its first principal repayment of \$37.5m and the remaining was paid with Notes for 2022.
Notes 2022 (Jan 2017) <sup>15</sup>	\$350m	12%	February 2022  Bond 2018 is supposed to have been used to pay back Notes 2022.	Proceeds from the issuance of \$350 million in Notes were used to prepay a previous \$300.0 million in project loans.  Commissions, fees and the offering discount directly attributed to the issuance of these Notes totalling approximately <b>\$18.2 million</b> . These financing costs are being amortized over the term of the debt using the effective interest method.
Revolving Credit Facility (May 2017) <sup>16</sup>	\$60m + \$15m	LIBOR +4 with a LIBOR floor of 0.00%.	May 26, 2020.	To be paid, pari passu, with Notes. Signed with three financial institutions.
Promissory notes (Sept 2017) <sup>17</sup>	\$ 11.5m	8.5%	Principal repayments commence January 1, 2020.  The promissory note will be fully repaid on October 1, 2021.	To finance the purchase of certain locomotives for the Rail Expansion project

<sup>14</sup> Preliminary Offering document p 660 (pdf)

<sup>15</sup> Preliminary Offering document pp 180 and 659 (pdf)

<sup>16</sup> Preliminary Offering document p 180 (pdf)

<sup>17</sup> Preliminary Offering document pp 180 and 659 (pdf)

## Iron Ore prices and price differentials

The model proposes two different future price scenarios for an iron ore benchmark. One is based on the International Monetary Fund projections of Iron Ore prices and the other proposes a constant price (which is escalated by inflation) that can be modified by the user. Based on this, the model assumes a premium of 21% over the spot price, given high iron ore grade and the average differential price obtained by BIMC, and BIMC's own methodology for price projections in the 2018 offering document. The model also integrates reported realized prices, relating to historic production.

## Fiscal regime

Revenue Stream	Description	Note
Inuit Remedial Payments	Assumes \$C26.50 / hour average payments on 283,000 hours pa short of Minimum Inuit Employment Goals.	ICA: conditional on approval of Phase 2.
Milestone Payments	\$C2m payments over 24 months after Phase 2 is approved	ICA: conditional on Approval of Phase 2.
IIBA Implementation Plan Payments	Historic payments of \$C3m per annum (pa), rising to \$C10m for two years following approval of Phase 2, dropping back to \$C8m pa afterwards.	ICA: conditional on approval of Phase 2.
Wildlife Compensation	\$C750k pa.	ICA: conditional on approval of Phase 2.
Pond Inlet Training Center	\$C10m over three years following Phase 2 approval.	ICA: conditional on approval of Phase 2.
North Baffin Daycare Centers	One center built per year 2021-2023, each costing \$C5m.	ICA: conditional on approval of Phase 2.
Land Lease	\$C3m pa ongoing basis.	
IIBA NSR Royalty	Two rates: lower flat rate of 1.19% from IIBA, higher rate starting at 1.5% but escalated over time and also according to price to a maximum of 3.75%	ICA: higher rate conditional on approval of Phase 2.
Nunavut Royalty	11.2% effective rate on operating profits post other charges <sup>18</sup>	

<sup>18</sup> Preliminary Offering p609

Corporate Income Tax	22.1% effective tax rate <sup>19</sup> on revenues after other charges have been deducted. Split 55% to federal level and 45% to Nunavut province.	
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The model integrates the fiscal regime as described by BIMC’s Preliminary Offering circular of 2018, and also the Inuit Certainty Agreement of July 2020. A range of revenue streams accumulate to the local community and the provincial and federal governments. Revenue flows at the community level depend strongly on approval of the Phase 2 extension. The Inuit Certainty Agreement announced in mid-2020 specifies that a large range of revenues are liable only if there is approval of the rail road to Milne Inlet.

The largest two streams are the royalty payable to Nunavut Tunngavik Inc. (NTI) and corporate income tax. The model adopts the approach of the technical assessment carried out by Roscoe Postle Associates (RPA) and included within the Preliminary Offering document published by BIMC. RPA says that on the advice of the BIMC they modelled an effective corporate income tax rate of 21.2%, compared to the statutory level of 27%, to account for various allowed deductions. Similarly, although the Nunavut Mineral Royalty is based on a sliding scale measured against pre-tax profits of between 5% and 14%, RPA modelled an effective royalty rate of 11.2%.

## Profitability Analysis: Lead Results

Since the public hearings scheduled for January/February 2021 are concerned with expansion of the Mary River Mine, the most significant question the model addresses is how profitable the mine is to the investor under various market and development scenarios.

### There are four leading conclusions:

- 1) While railway expansion would clearly be more profitable for BIMC than continued trucking, trucking would nevertheless yield rates of return that are considered normal in many mining businesses, under all realistic price scenarios looking forward to 2020.
- 2) A rail expansion to Steensby would be highly commercially viable even if it required an additional billion US dollars in capital than would be needed for Milne Inlet.
- 3) Developing both export rail routes to produce 30 MTPA would generate significant extra cash for the company over the decades to come, but only marginally increase the Life of the Project (LoP) rate of return from already high levels achieved by only one rail route.

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<sup>19</sup> Preliminary Offering p609

- 4) There are uncertainties around the costs of ongoing BIMC operations and expansion possibilities which create a high degree of uncertainty around potential rates of return, and it would advance public debate if BIMC and the relevant authorities were to make more information available.

## **The metrics: Life of Project Rate of Return**

In this report, the metric used to establish bankability is the Internal Rate of Return (IRR), one of the metrics most widely used by investors in projects like the Mary River Mine.

The model factors IRR over the entire life of the project from 2011, since this represents a reasonable measure of whether the terms offered to BIMC at Mary River are in line with industry norms and commercial considerations. This totals \$2.38 billion of capital and operating costs to the end of 2020, including \$788 million of capital investment in the 2011-13 period before the mine started producing. It should be noted that if the economics of the mine were considered only from today forward in time (so-called “point forward” economics), Mary River would achieve very high profitability under all scenarios.

In order to calculate this, the model has incorporated all data in the public domain related to costs, prices and sales since the development of the mine started in 2011 and up to the present day. Then the models builds projections of the future based on estimated costs of operations and the capital needed to build a railway line to Milne Inlet, measuring them against the tax regime applied to the mine and different scenarios for the future price of iron ore.

The model further defines 10% as the minimum acceptable LoP IRR for the mine. This is based on industry norms, where a 10% discount rate (equivalent to 10% IRR) is often applied to the Net Present Value of an asset in the absence of more detailed investor-specific information.<sup>20</sup> As one comparison, such a rate of return is also above average returns on stock market investment in the United States.<sup>23</sup>

## **Comparison of Expansion to Continued Trucking**

Profitability for BIMC and its backers is enhanced under all price scenarios if either Phase 2, at 12 MTPA, or Phase 3, at 18 MPTA is approved. Under the IMF price scenario for the iron ore benchmark, for example, a Phase 2 approval would achieve a rate of return of 18.1% over the life of the project (LoP) and a Phase 3 approval would achieve LoP of 20.6%. But

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<sup>20</sup> See, for instance, the discount rates embedded in the International Monetary Fund’s extractives modelling tool, FARI (<sup>23</sup> [Fiscal Analysis of Resource Industries \(FARI\) \(imf.org\)](https://www.imf.org/)).

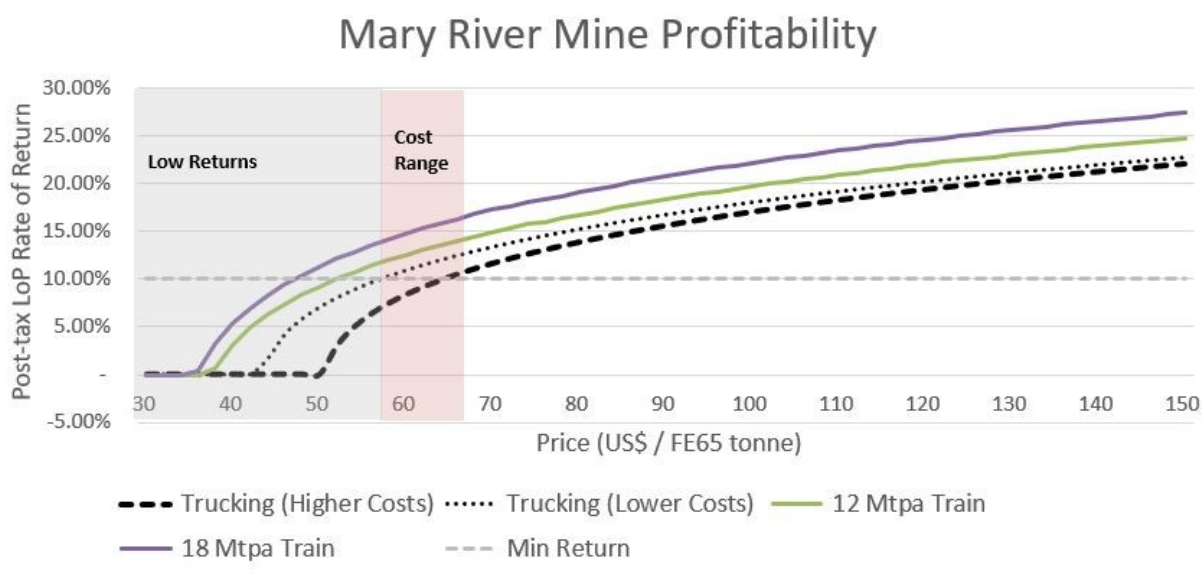
Credit Suisse 2018 Global Investment Returns Sourcebook



continued trucking (at the rate of 6.6 million tonnes per year) would still achieve a LoP rate of return of 16.3%.

Another way of reviewing profitability in modeling is to look for the “breakeven price” of iron ore which would assure the 10% IRR. A Phase 2 expansion under the plans published by BIMC in mid-2018 would require a breakeven price of \$51 per tonne on CFR iron ore at 62% grade, while Phase 3 would require a breakeven of \$46 per tonne.

The continued trucking scenario would require a breakeven price of between \$57 and \$64 per tonne on the benchmark iron ore price, depending on what assumptions are made about operating costs (see the discussion below).



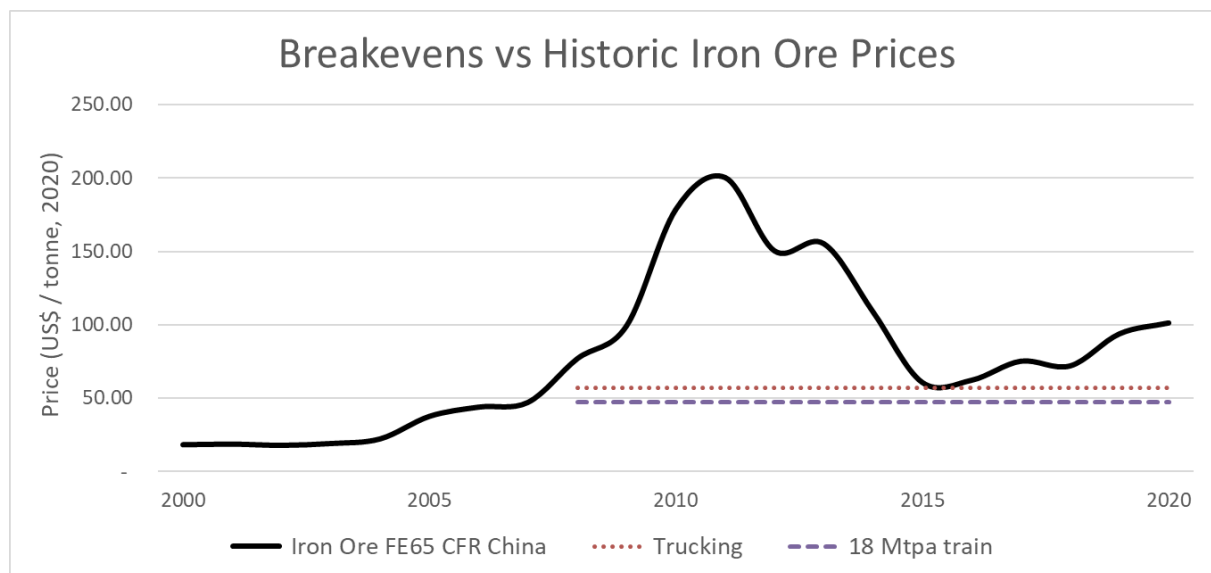
The graphic above illustrates the dynamic. The minimum IRR of 10% is shown by the horizontal dotted line, and the curves represent the rates of return achieved by different development pathways against different price assumptions. Even under trucking, therefore, that IRR could be achieved at as low as \$57 per tonne.

### The Hedged Price Scenario

The breakeven at constant price in the long-term drops still further if we construct a price scenario that takes the state of the market at the end of 2020 into account. Iron ore prices on the spot market hit their highest figure since 2011 in December 2020, at over \$160 per tonne. Prices are unlikely to remain that high into 2021, and prices were already constrained in the last days of 2020 by intervention from Chinese steel producers, limiting the amount of

financial speculation in iron ore instruments that could take place.<sup>21</sup> But the wide expectation of analysts in the market is that prices will continue at well above \$100 per tonne into 2021 and perhaps further. Current high prices, and short-term expectations already signalled in the market by futures, allow a hedging scenario. Under this scenario, we assume an average price of \$110 for the benchmark in 2021, then \$105 in 2022, \$100 in 2023, and \$95 in 2024.

When the model is interrogated assuming these benchmark prices over the short- and medium-term, the constant price required to achieve the minimum rate of return in the period after that drops to \$45 (if higher operating costs are assumed, or as little as \$35 per tonne if lower costs are assumed). This scenario represents only a modest capture of windfall rents that have already manifested in the market, leveraged by hedging which is widely available.



While the breakeven metric is useful to give some indication of the relation between price and profitability, the reality is that iron ore prices, like all commodities, are volatile. The graphic above accordingly places the rate of return of the Mary River mine, under trucking and rail expansion, against benchmark prices over the last 20 years. The FE62 CFR China benchmark which RPA used in the technical analysis published by BIMC is plotted since 2000, adjusted up for inflation. Then the two breakeven prices of trucking (under lower price assumptions) and a Phase 3 expansion to 18 MTPA are drawn across the price fluctuations to see how often the price would take the returns above the minimum.

The chart shows that iron ore pricing changes fundamentally at the end of the 2000s, and despite continued fluctuation have stayed higher throughout the second decade of the century than in the first. Under a railway expansion, the Mary River Mine would hit the

<sup>21</sup> [Iron Ore Rattled as Crackdown Plea From China Mills Spurs Slump - Bloomberg](#)

minimum rate of return at any time after 2008. The same is also true for trucking, although in 2015, when prices were at their lowest in the 2010s, the two lines get close.

These charts show rates of return summed over the life of the project, combining the nine years of building and operating, and the future. This is to give insight on the question of whether the terms offered the investor at MRM are within global industry norms. It is important to understand, though, that since MRM is already operating, a decision about if to continue production or not is likely to be guided simply by operating profits. This relates to the structure of investment in mining, with high upfront costs. Even if a bear market means investors are unlikely to obtain the hoped-for overall rate of return over the life of the project, they will keep the mine going as long as they are not operating at a loss.

The Mary River mine has several advantages which make it viable under a wide range of price scenarios, even if the most profitable development path is not chosen. The quality of its iron ore gives it a considerable premium in price, avoids expensive onsite processing, and despite the remote location of the mine, it has relative proximity to markets in Europe.

## Inuit Rightsholder Benefit Levels

The Inuit Certainty Agreement announced in mid-2020 announced an increase in many factors to Inuit rightsholders (listed in the analysis of the fiscal regime above), but made most of them conditional on approval of the rail expansion to Milne Inlet on the grounds that they would not be sustainable under a scenario of continued trucking. The model has demonstrated that trucking is sustainable, depending on more precise data on costs, at price levels well below end of 2020 spot prices and market averages for the last decade.

**The table below demonstrates under the hedged scenario that these higher levels of benefits to Inuit rightsholders would still leave room for commercial viability.** The ICA could be applied with the long-term benchmark price at \$60 per tonne on continued trucking, and BIMC could still achieve a 12% post-tax rate of return.

<b>Stage 2 Not Approved</b>	<b>\$60 / t CFR62</b>		<b>\$80 / t CFR62</b>		<b>\$100 / t CFR62</b>	
<i>(Inuit rights in USD)</i>	<i>Rights</i>	<i>IRR</i>	<i>Rights</i>	<i>IRR</i>	<i>Rights</i>	<i>IRR</i>
ICA Not Applied	\$335m	13.4%	\$392m	15.7%	\$449m	17.3%
Royalty-Only Applied	\$623m	13.1%	\$909m	15.4%	\$1,086m	17.1%
ICA Applied	\$1,131m	12.0%	\$1,416m	14.7%	\$1,593m	16.5%
<b>Stage 2 Approved</b>						
ICA Applied	\$1,354m	18.9%	\$1,805m	20.6%	\$2,086m	22.0%

Of the many revenue streams that could flow to Inuit rightsholders under the ICA, the IIBA royalty is both the biggest by far – and also the one which has the least impact on investor

profitability. This is because they are price and time-indexed, and so most of the difference in the higher levels is only triggered when BIMC has earned more profit, later in the project.

The royalties agreed in the ICA are *fiscally progressive*. Under all long-term constant prices, applying the higher royalty in the ICA under trucking would at least double the level of benefit to Inuit rightsholders, but reduce the company's rate of return by no more than 0.2-0.3%. More benefits flow if Stage 2 is approved, as the higher royalties are then applied on a higher volume of production. But it is clear that rightsholders could gain substantially greater benefits without the need to create conditionality on the approval of Stage 2.

## **Expansion to Steensby**

Precise estimates for the capital costs of expansion to Steensby are difficult to find in the public domain. BIMC changed its development plans first to early revenue by trucking to Milne Inlet in 2014 and then by preparing for a rail route there beginning in 2017. Although various routes to Steensby were reviewed, and one was finally settled on for the rail corridor that was granted, nevertheless there are no published costs recent enough to be reliable.

The model therefore explores the Steensby route using sensitivity analysis on production and development costs. Profitability was examined assuming that a route to Steensby would require \$1.5 billion of capital over three years, and that none of the \$527 million already spent on expansion in the period of 2017-19 could be transferred. With the prices for 2021-2025 hedged against the spot markets at the end of 2020, and standing at \$80 per tonne thereafter, BIMC could achieve a LoP IRR of 22% under this scenario. A Steensby development option also carries considerable buffer against downside price due to the 2020 state of the market.

## **The Two Railway Scenario**

A development scenario under which both Milne Inlet and Steensby are operating is also explored using sensitivity analysis. Production is adjusted to 30 MTPA and future capital costs to \$2.45 billion to cover the costs of developing both routes. Cash earnings for BIMC rise from \$24 billion to \$38 billion over the life of the project. But because the greater production has required proportionately greater capital investment, the impact on the rate of return is much more modest. BIMC's Internal Rate of Return rises to 25.2% under this scenario, compared to 22% for just Steensby (with its extra \$1.5 billion capital requirement), and a 23.5% rate of return assuming a Phase 3 expansion was approved for 18 MTPA to Milne Inlet.

## Cost Uncertainties

There are three significant uncertainties in costs that the model has to accommodate. The first is capital costs which BIMC has undertaken since 2017, and the second is estimates of ongoing costs if a trucking operation continues.

BIMC annual reports state that \$352 million was spent on preparing expansion for the rail export route. The model estimates another \$175 million spent during 2019. This means a second capital phase has already taken place of over 500 million dollars. It is important to distinguish the fiscal treatment of such costs from a financial analysis which seeks to estimate what rates of return would be under normal operational practice. Even if the regulations of Canada and Nunavut allow those costs to be written down against profits, it does not follow that an analysis of whether investors have a reasonable path to profitability needs to admit them in estimates of rates of return. The model offers a switch on the dashboard to include or exclude these costs. Under the trucking scenario, allowing these costs makes a 3% difference in the rate of return of the project.

The second uncertainty is around operating costs under a trucking scenario. The Preliminary Offering document quotes different numbers at different places, and it is unclear which are definitive. For example, the analysis of the forward-looking expansion plans estimate operating costs in 2018, before the rail expansion has happened, at \$42 per tonne, including an \$11 trucking charge, implying underlying operating costs at the mine site of about \$30 per tonne.<sup>22</sup> Earlier in the same document, a summary of earlier annual reports shows operating costs of \$45 in 2016 and \$42 in 2017 before an \$11 trucking fee to Milne Inlet.<sup>23</sup> Earlier studies indicated lower operating costs at the mine site. As with the capital expansion costs, the model offers a switch on the dashboard which shows the impact of higher or lower operating costs. Under the trucking scenario, allowing these costs makes a 2% difference in the rate of return of the project.

The third uncertainty relates to BIMC's own financial situation. The model creates estimates of investor rates of return after tax without regard to financing. In most major extractives projects, project financing is a major component which increases the rate of return of the mining company. This is because the internal cost of capital is higher than the interest rate at which mining companies can borrow money for capital projects (which is the reason companies seek project finance). For a mining major, for example, an IRR at the project level of 10% post-tax could typically lead to a return on the company's own equity of between 12% and 15%, depending on the amount of leverage and the interest rate charged. As mentioned above, BIMC has taken on at least four loans for a total of about \$700 million with interest rates as high as 12%. This could lead to project finance costs forming a

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<sup>22</sup> Preliminary Offering p600

<sup>23</sup> Preliminary Offering p35

considerable part of the overall costs of MRM. However, since the purpose of the financial analysis is to determine what rates of return would be using industry norms, it would not be normal practise to adapt rates of return to higher than average project finance costs. **The communities of Baffin Island, and government at the territorial and federal levels, do not need to accommodate unusually high leverage and interest rates to ensure a fiscal and operational regime that would normally be considered viable.** The model does not project finance costs, although these could be added at a later stage.

The difference in outcome between the lowest and highest range of assumptions in these uncertain areas is considerable. Breakeven price under lower operating cost assumptions, and excluding the second capital phase, are \$57 per tonne, whereas breakeven under higher assumptions is \$74 per tonne.

## Recommendations

The model and this report do not seek to determine what the appropriate development path of Mary River mine is. Rather they seek to determine what would provide optimal insight on the business model of the mine, and BIMC, to inform public discussions. Recommendations are therefore about the process of evaluation, not the final outcome.

- **Capital Costs:** BIMC should provide detailed information about the second phase of capital costs from 2017-19, estimated at over half a billion dollars. In particular, what proportion of that related purely to an increase of production that has already happened from the initial levels of the ERPP of 3.5 MTPA to the current 6.6 MTPA, and how much related to preparation for further expansion in production to 12 MTPA under the Phase 2 plan.
- **Operating Costs:** BIMC should provide a separate estimate of operating costs under a continued trucking operation, and relate it in clear fashion to past estimates and reports of operating costs.
- **Steensby:** BIMC should provide an explanation of what the capital and operating costs would be under its original expansion scenario of building a railway south from the mine to Steensby. Preliminary indications are that capital costs to Steensby would be in the same order of magnitude as those for the route now suggested north to Milne Inlet, and therefore similar (and higher) rates of return could be achieved. The Steensby option seems to have been removed from operational consideration for the moment. But since it achieved the approvals the route to Milne Inlet has not so far been granted, and could be more acceptable to Inuit rightsholders, it is incumbent on the company to explain why it believes Milne Inlet is preferable to Steensby, in contrast to its earlier analysis.

- **Longer term plans:** Since the Steensby route was already approved, it is possible that BIMC would intend to develop it as well as Milne Inlet, for a total production of 30 MTPA out of Deposit 1. An earlier BIMC study estimated measured and inferred mineral resources across Deposits 1 to 3 at 850 million tonnes.<sup>24</sup> BIMC should publish any economic evaluation it has made of possible expansion both at the current site to 30 MTPA, and also neighbouring deposits.
- **Initial Public Offering:** the Inuit Certainty Agreement of June 2020 specifies that a payment would be made to local communities in the event of an Initial Public Offering of shares in BIMC on a stock exchange. Such an IPO would have the potential to raise large amounts of investment on the expectation of expanded operations, allowing initial shareholders to realise substantial profits on partial or complete sale of their interest. BIMC should make available to Inuit rightsholders and other stakeholders any internal deliberations it has had about an IPO.

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<sup>24</sup> Preliminary Circular p353