



# Joyce Lake DSO Iron Ore Project

---

NI 43-101 Technical Report  
Feasibility Study  
December 13, 2022



# Joyce Feasibility Study Top KPIs *(NI 43-101, Dec 13, 2022)*

**C\$185M**

*Post-tax NPV<sub>8%</sub>*

**20.01%**

*Post-tax IRR*

**3.7 Years**

*Post-tax Payback*

**C\$270M**

*Initial Capex*

**C\$61.32**

*FOB Opex/dmt*



*General study management, mining, processing, site infrastructure, estimation, financial analysis, report integration*



NI 43-101 Technical Report

**Feasibility Study for the  
Joyce Lake DSO Iron Ore Project**  
Newfoundland and Labrador, Canada

Prepared for:  
Century Global Commodities Corporation  
Joyce Direct Iron Inc.

Effective Date: October 31, 2022  
Signature Date: December 13, 2022

Prepared by the following Qualified Persons:

• Derek Blais, P.Eng.	BBA Inc.
• Joanne Robinson, P.Eng.	BBA Inc.
• Sheldon Smith, P.Geo.	Stantec Consulting Ltd.
• Claude Duplessis, P.Eng.	GoldMinds Geoservices Inc.
• Byron O'Connor, P.Eng.	Pinchin Ltd.
• Guillaume Joyal, P.Eng.	Englobe Corporation



*Mineral resource estimate*



*Environmental permitting*



*Geotechnical considerations  
including pit slopes*



*Hydrogeology*



*Iron ore market study*

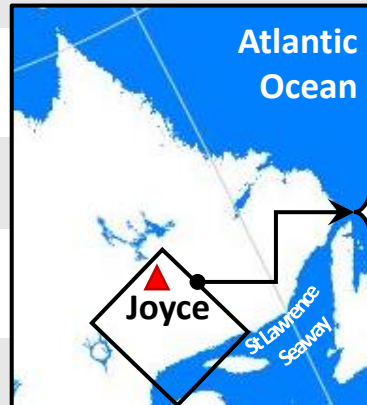
- 3-year look back 62% Fe fines iron ore price, CFR China, of US\$124.95/dmt and FOB Sept Iles US\$98.89/dmt
- Full NI 43-101 feasibility study report published on December 13, 2022 is available on [www.sedar.com](http://www.sedar.com) and [www.centuryglobal.ca](http://www.centuryglobal.ca)



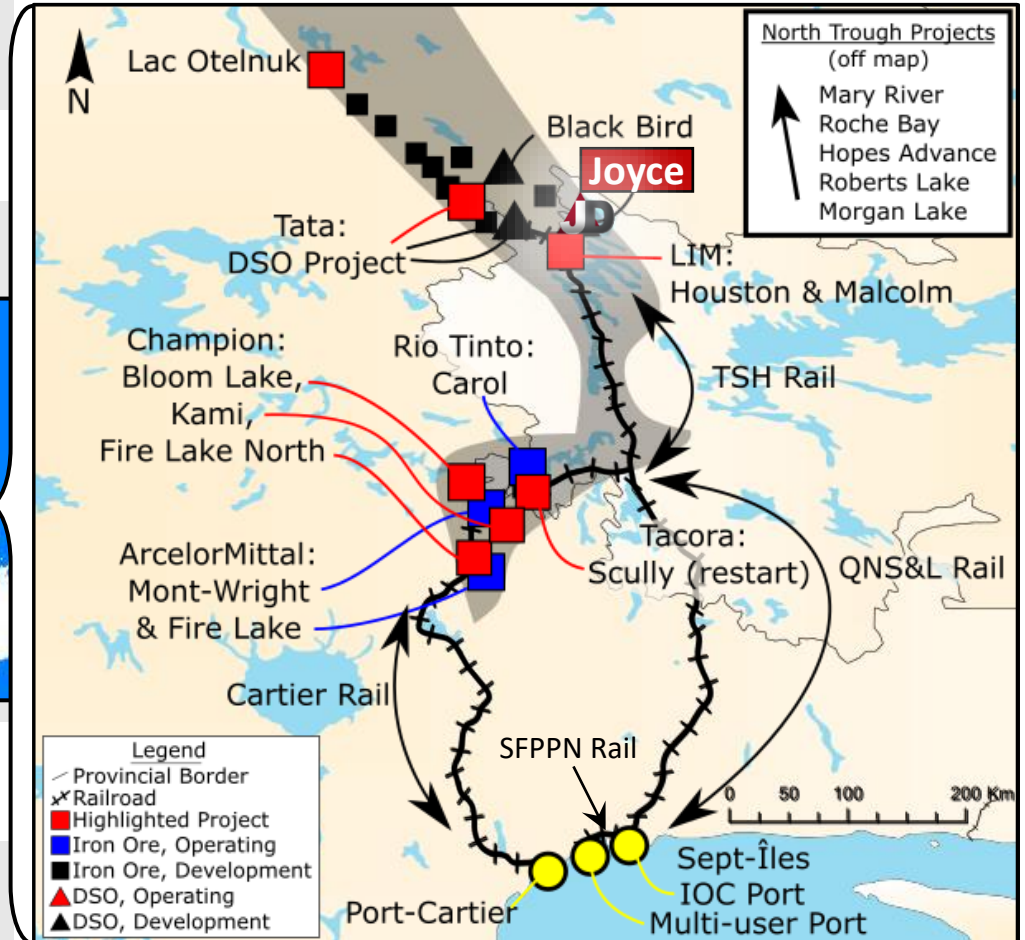
# Joyce 2022 Feasibility Key Parameters

## Definitive Feasibility Study Highlights

<b>24Mt+</b>	24Mt M&I resources @~59% Fe + inferred of 0.83Mt @>62 % Fe <sup>(1)</sup>
<b>17.4Mt</b>	@~60% Fe reserves <sup>(2) (3)</sup>
<b>2.5Mtpa</b>	Annual production of ~1/3 lump & ~2/3 fines for 7+ yrs (~5 yrs > Fe 61%, ~2yrs Fe sub-55%)
<b>1.5 years</b>	Construction time without any production ramp up
<b>C\$15.57/t</b>	Initial Capex/t
<b>C\$95.25/t</b>	Opex/t (CFR, China, frt: \$33.93/t) = US\$73.28/t (frt: US\$26.06/t)
<b>Logistics</b>	Rail & expanded port in operation
<b>No tailings</b>	Dry crushing & screening with lump only drying (4 to 2% moisture) during non-winter months
<b>Exploration Potential</b>	Exploration targets in immediate area with substantial geophysical surveys & orientation drilling



## Schefferville, Labrador Trough



(1) @50% Fe cut-off

(2) @52% Fe cut-off

(3) 1:4.25 strip ratio

# Feasibility Study Resources and Reserves

## Joyce Lake Mineral Resources <sup>(1)</sup>

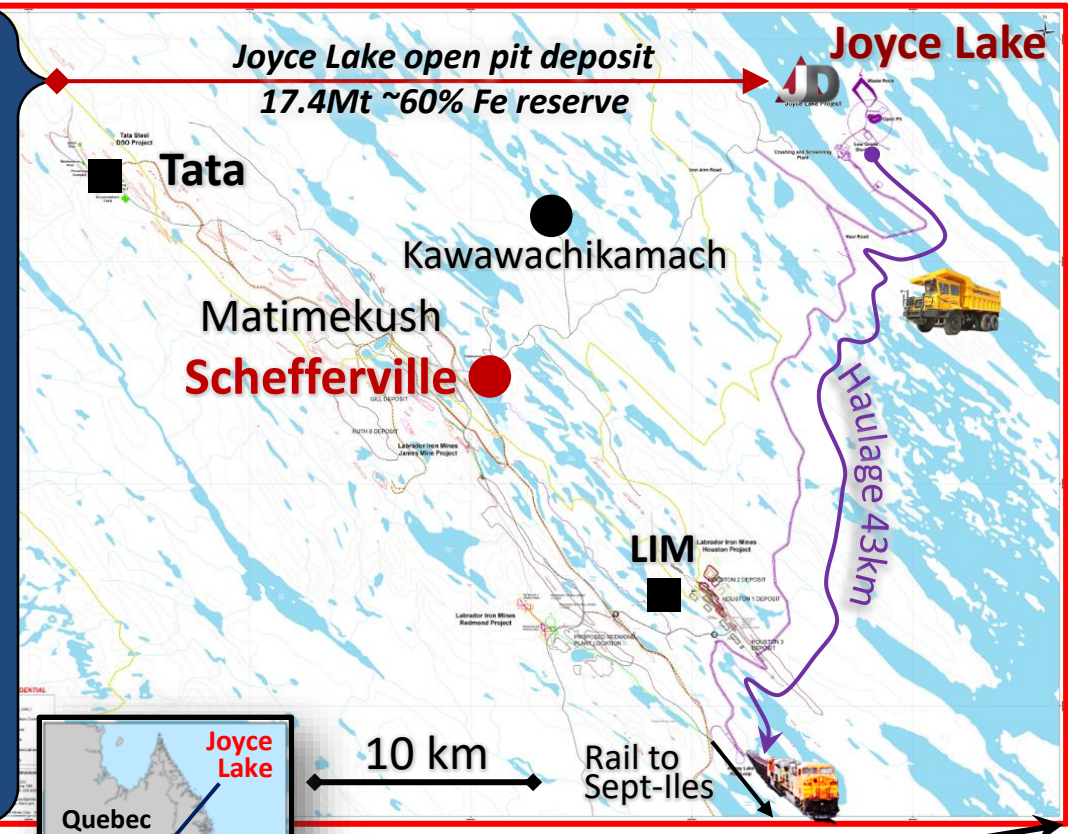
Category	Cut-off Fe	Tonnes	Fe	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Mn
Measured & Indicated	50% Fe <sup>1</sup>	23,970,000	58.63%	13.22%	0.54%	0.75%
Inferred	50% Fe <sup>1</sup>	830,000	62.10%	8.3%	0.43%	0.78%

## Joyce Lake DSO Proven & Probable Reserves <sup>(2)</sup>

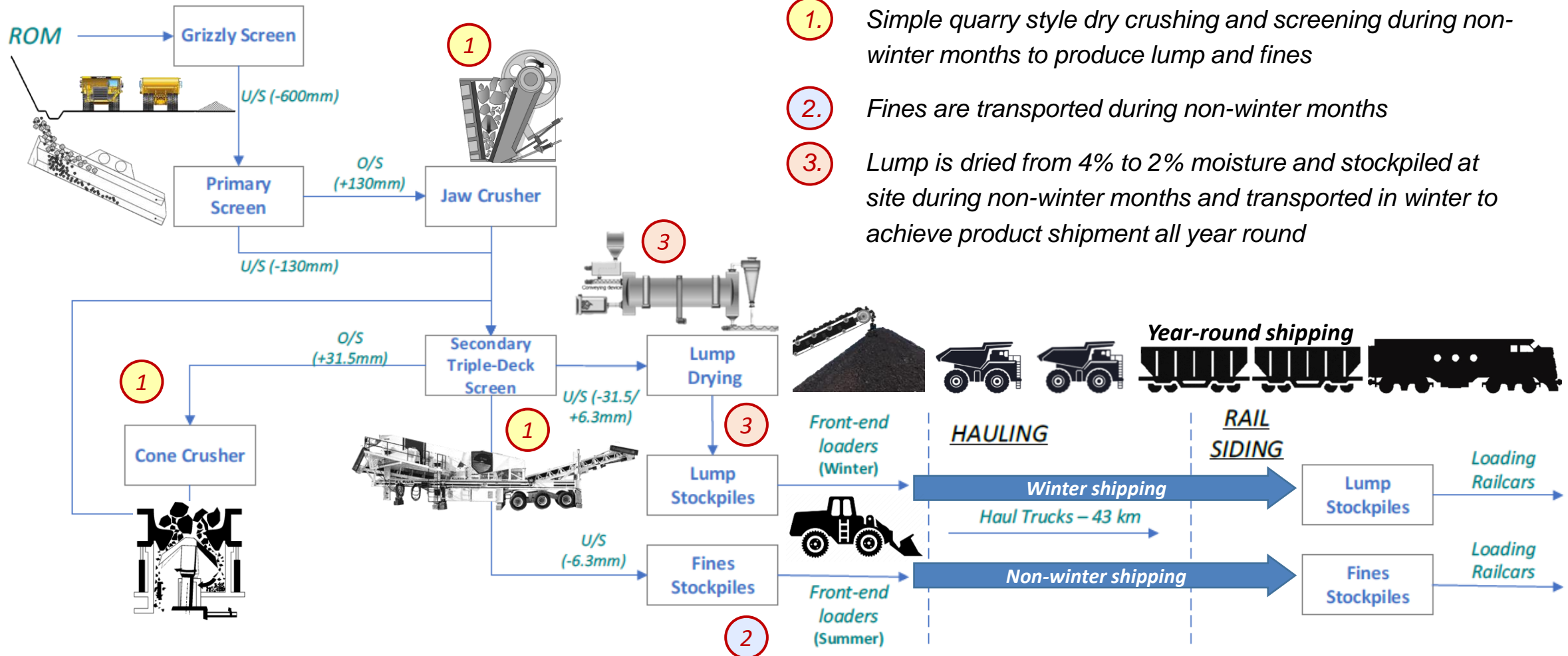
High Grade	above 55% Fe	13,810,000	61.62%	8.85%	0.54%	0.80%
Low Grade	52%-55% Fe	3,560,000	53.45%	20.67%	0.61%	0.61%
Total Reserves		<b>17,370,000</b>	59.94%	11.28%	0.55%	0.76%

(1) NI 43-101 Mineral resources estimated based on the cutoff grade of 50%

(2) NO 43-101 Mineral reserves estimated for Joyce Lake



# Quarrying with Dry Crush/Screen (Non-winter months only)

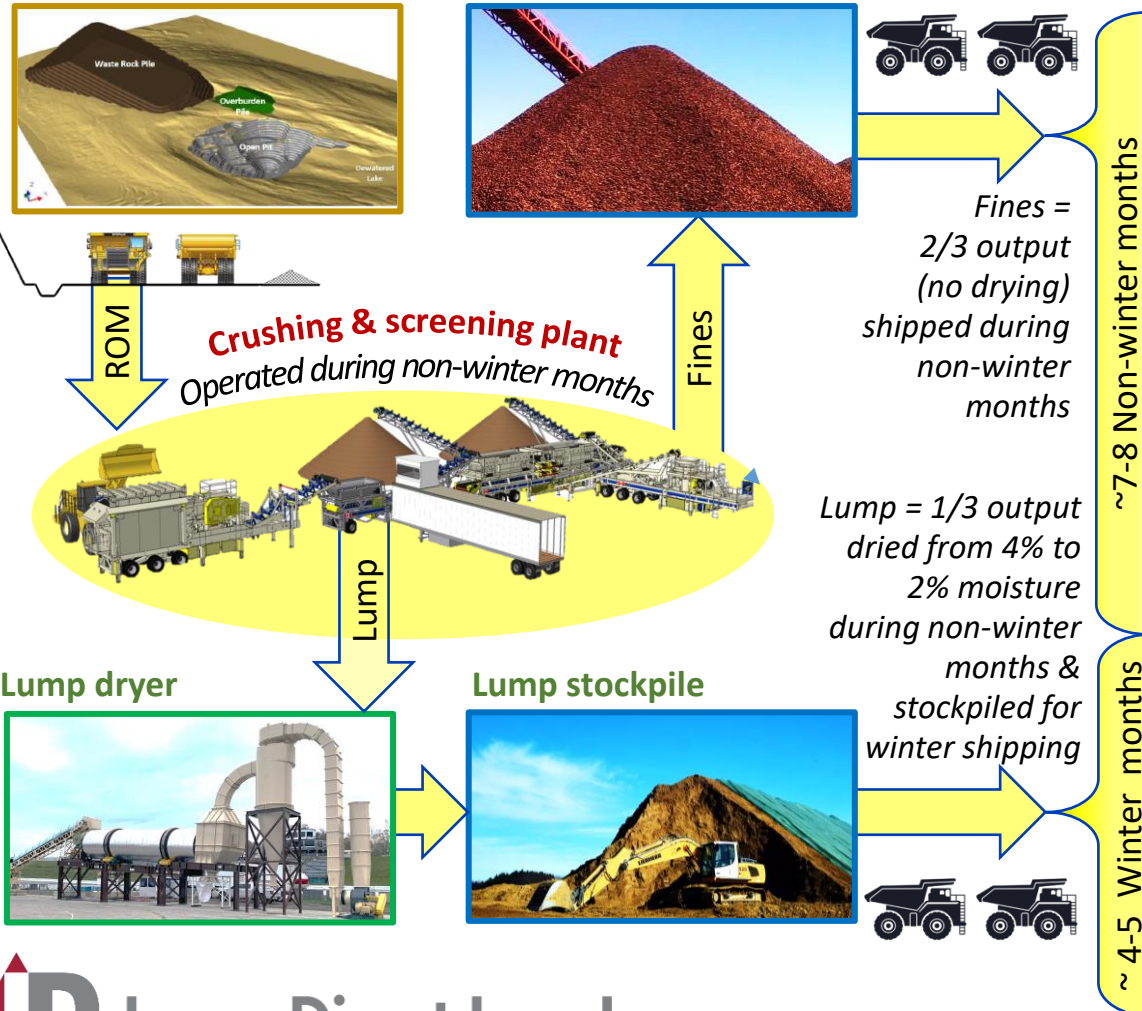




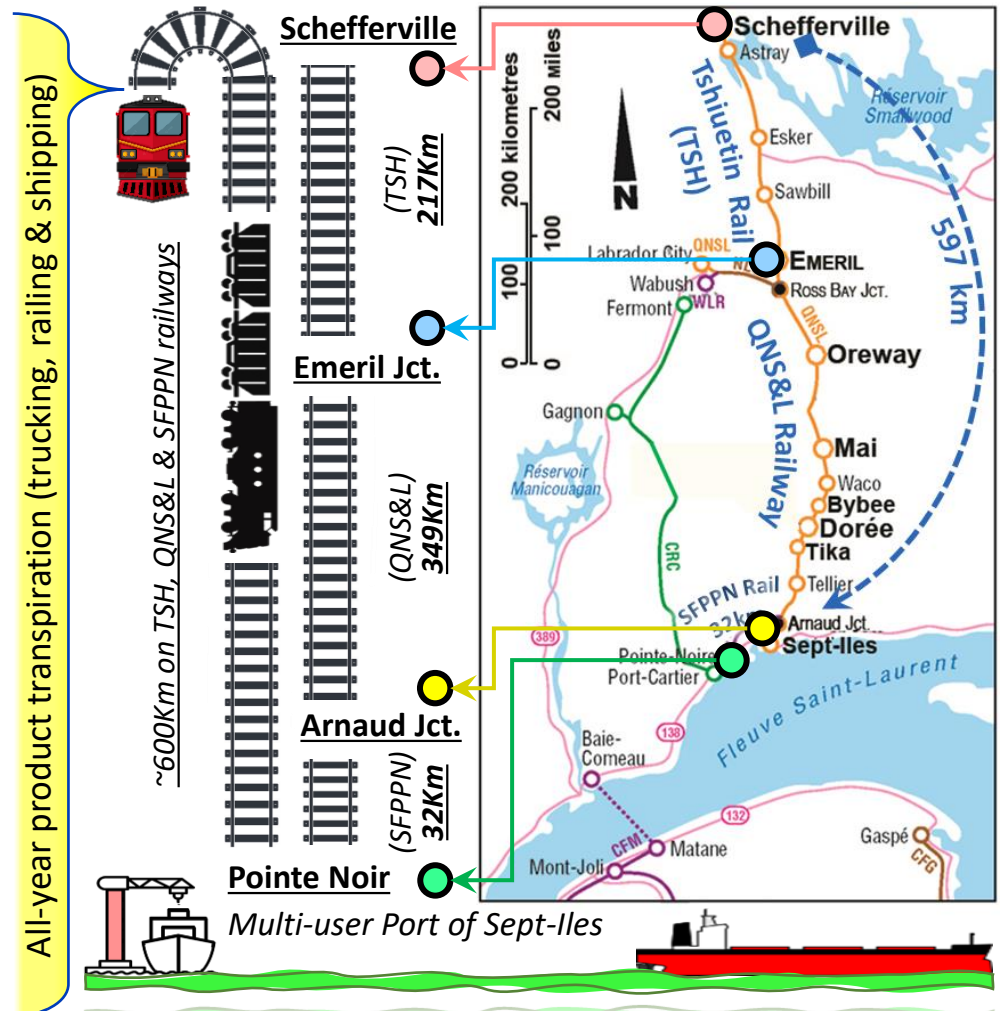
# 2.5 Mtpa Crushing / Transportation Strategy

Transporting fines and drying lump (4% → 2% moisture) during non-winter months for year-round product transportation

## Crushing, Screening, Lump Drying

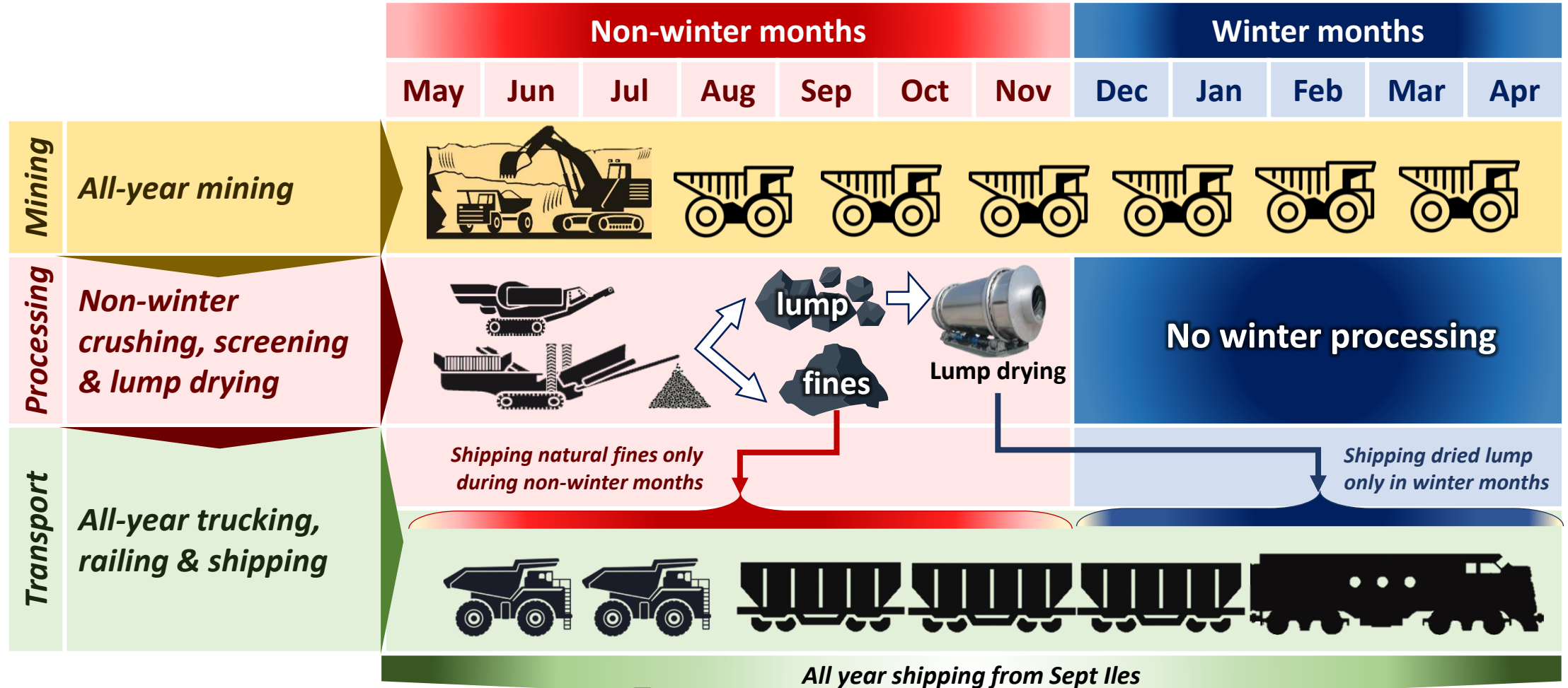


## All-seasons Transportation



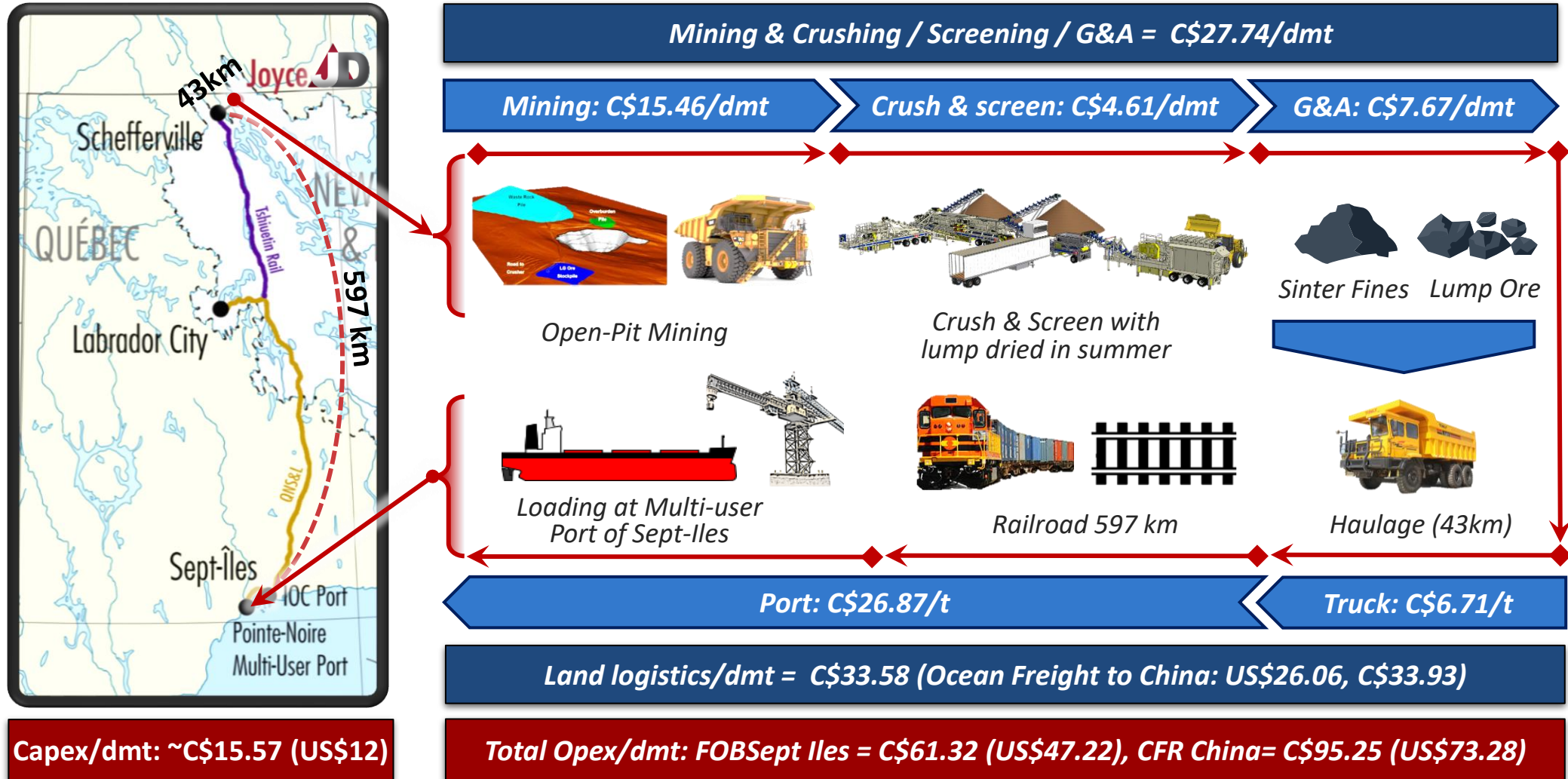
# Innovative Crushing & Logistic Strategy

*Drying 1/3 low moisture (4% → 2%) lump products in summers for winter shipping*



# Simple 2.5Mtpa Quarry Operation

Dry crushing & screening with lump dried in summer to enable all-year transportation





# Joyce 2022 Feasibility Economics Summary

Product Operating Cost		C\$/dmt	Initial Capital Cost		C\$M	Subtotals (C\$M)		
Mining	\$	15.46	<div>Mine &amp; Plant</div> <div><div>Mine Preparation</div><div>Processing Plant</div><div>Mine Mobile Equipment</div></div> <div>\$</div> <div>59.57</div>					
Crushing Plant	\$	3.72						
Drying Plant	\$	0.89						
Mining/Processing Subtotal		\$					20.07	
G & A Subtotal		\$	7.67	<div>Mine Services</div> <div><div>Telecommunications</div><div>Power Plant</div><div>Maintenance Shop</div><div>Camp</div><div>Laboratory</div><div>Drying Plant</div></div> <div>\$</div> <div>60.97</div>				
Product Truck Hauling	\$	6.71	<div>Infrastructure</div> <div><div>Railroad and Yard</div><div>Rock Causeway</div><div>Haul Road &amp; Infrastructure</div></div> <div>\$</div> <div>69.53</div>					
Rail Yard Operation	\$	1.81						
Rail Transportation	\$	25.06						
Logistics Subtotal		\$					33.58	
Total FOB Sept-Îles (C\$)		\$					61.32	
Total FOB Sept-Îles (US\$)		\$					47.22	
Oceanic freight to China (US\$)	\$	26.06	<div>Cars &amp; Trucks (Initial Leasing Payments Only)</div> <div><div>Haul Trucks</div><div>Rail Cars</div></div> <div>\$</div> <div>19.18</div>					
Total CFR China (US\$)	\$	73.28						
CFR China Fe 62% Price Assumed (US\$/dmt) (= 3-Year Lookback Average to March 31, 2022)	\$	124.95						
2022 Average	\$	120.73						
Capex & Opex in US\$			<div>Total Direct Cost</div> <div>Indirects</div> <div>Contingency 10% (excl. leasing)</div> <div>Total Project Capital Cost (C\$15.57/dmt)</div> <div>\$</div> <div>209.26</div> <div>42.79</div> <div>18.39</div> <div>270.43</div>					
Current FX (BFS for C\$1)	\$	0.77						
Opex FOB per tonne	\$	47.22						
Capex (Millions)	\$	208.23						
Total LOM Production (Mt)		17.371	Pre-production capital				\$	80.40
Capex per dry tonne	\$	11.99	Life of Mine Sustaining Capital				\$	18.30

**NPV<sub>8%</sub>**  
**\$357.2M**  
 (Pre-tax)  
**\$184.6M**  
 (Post-tax)

**IRR**  
**27.72%**  
 (Pre-tax)  
**20.01%**  
 (Post-tax)

**Payback**  
**3.2 yr**  
 (Pre-tax)  
**3.7 yr**  
 (Post-tax)

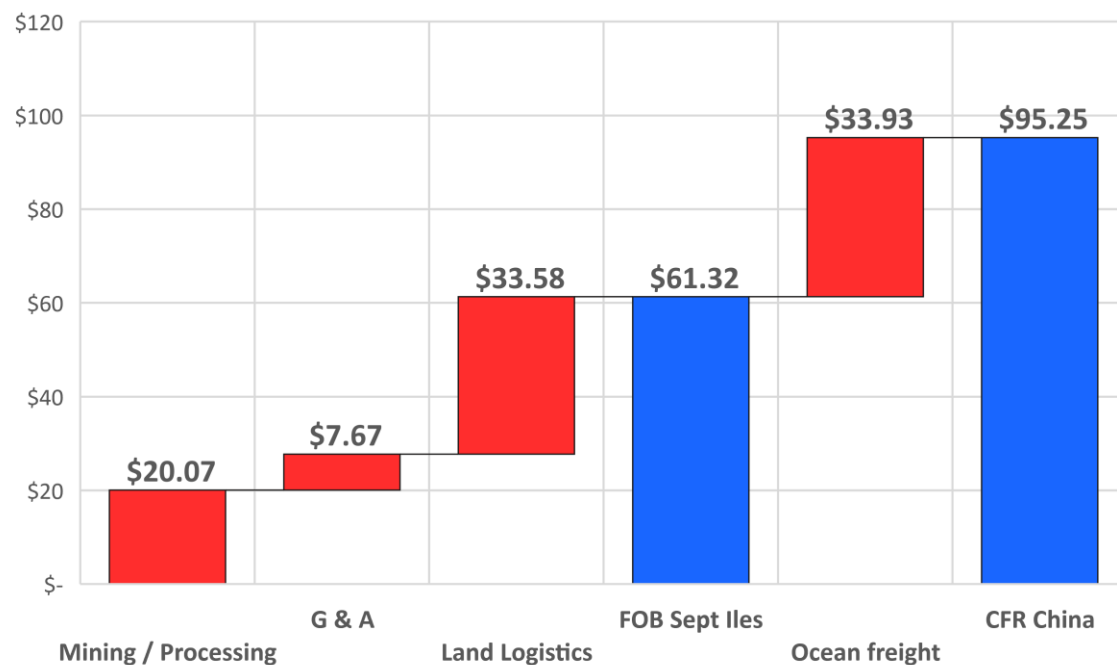
# Joyce Feasibility: CFR (China) Opex Breakdown

## FOB Opex (C\$61.32 /dmt) Breakdown

## CFR China Opex (US\$73.28/dmt) Breakdown

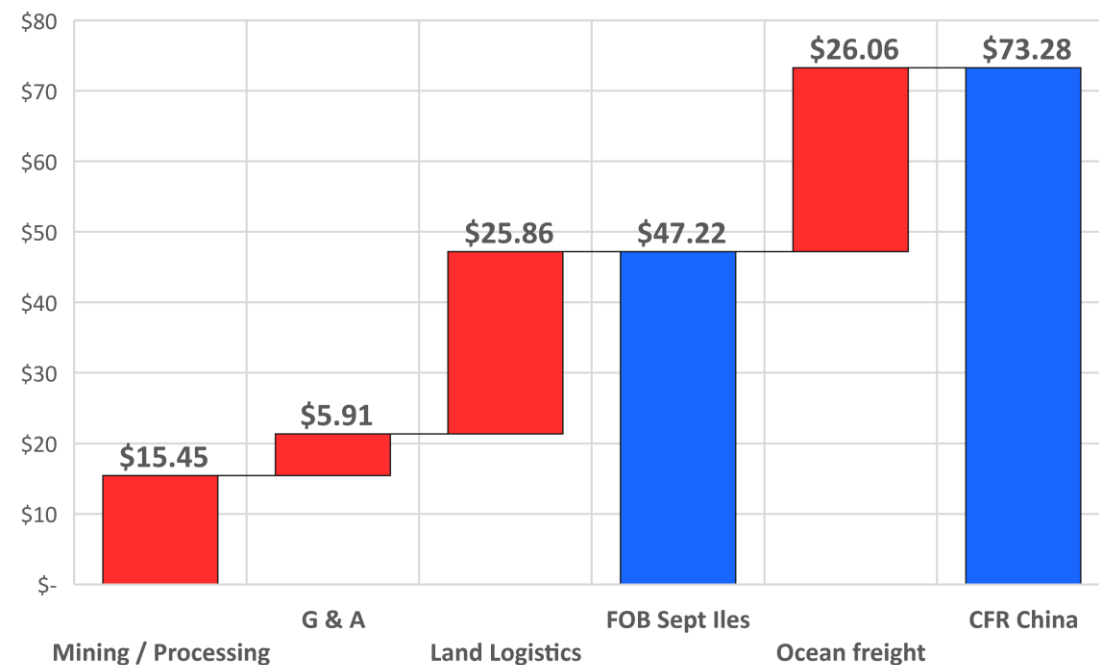
### Opex in C\$/dmt

■ Increase ■ Decrease ■ Total



### Opex in US\$/dmt

■ Increase ■ Decrease ■ Total

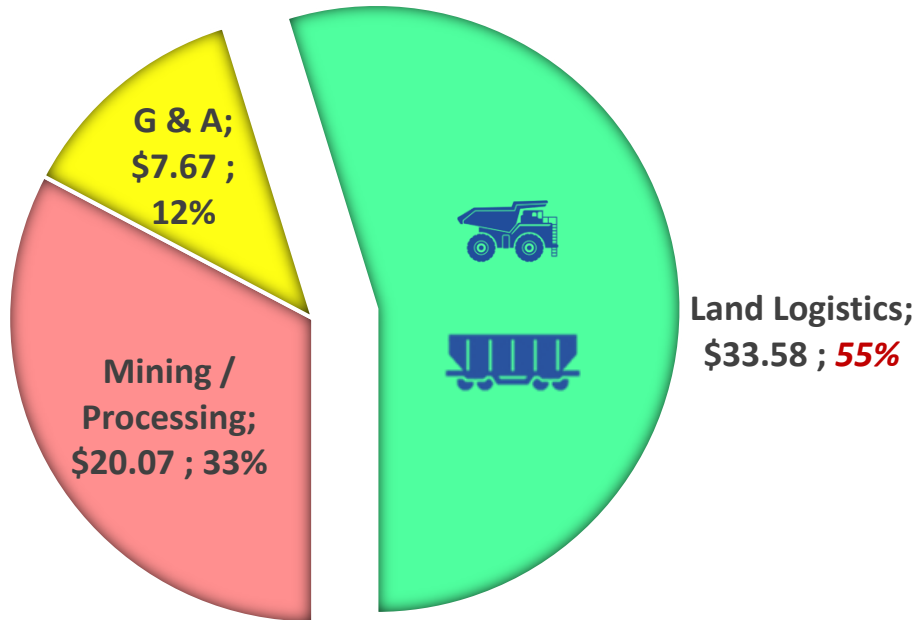




# Logistics: The Major Component in Opex

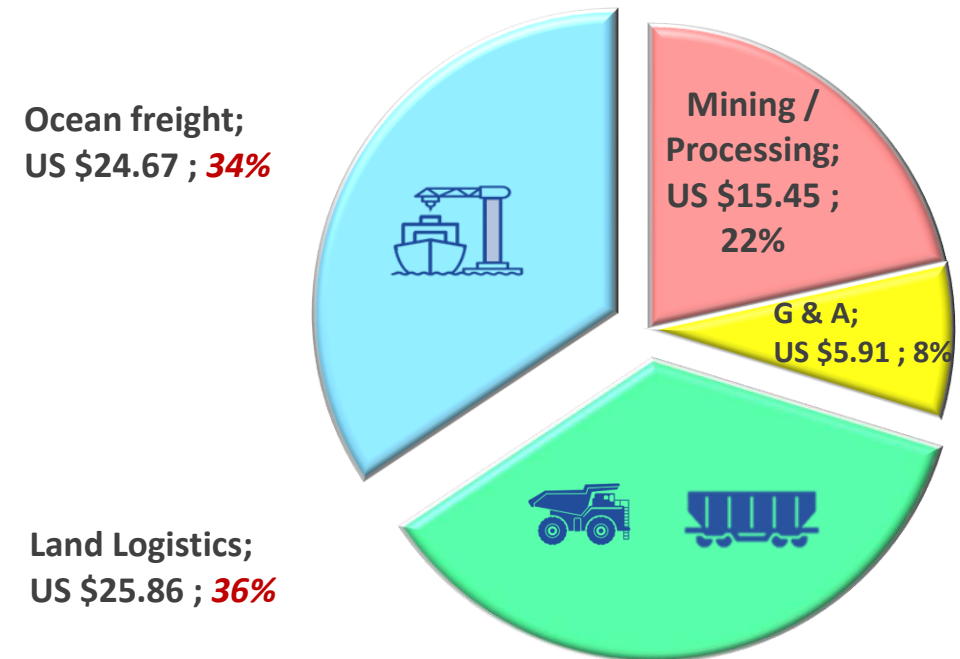
## FOB Opex (C\$61.32 /dmt) Breakdown

Land logistics Opex is **55%** of FOB (Sept 1les) Opex

















## CFR China Opex (US\$73.28/dmt) Breakdown

Land & ocean logistics Opex represent **70%** CFR (China) Opex



- Most of iron ore mining Opex in the bulk sector is logistics costs as demonstrated in the study
- Controlling logistics costs is to effectively control cost competitiveness of project
- Ocean freight costs (global market driven & beyond project control) also drive the spot (CFR China) iron ore price

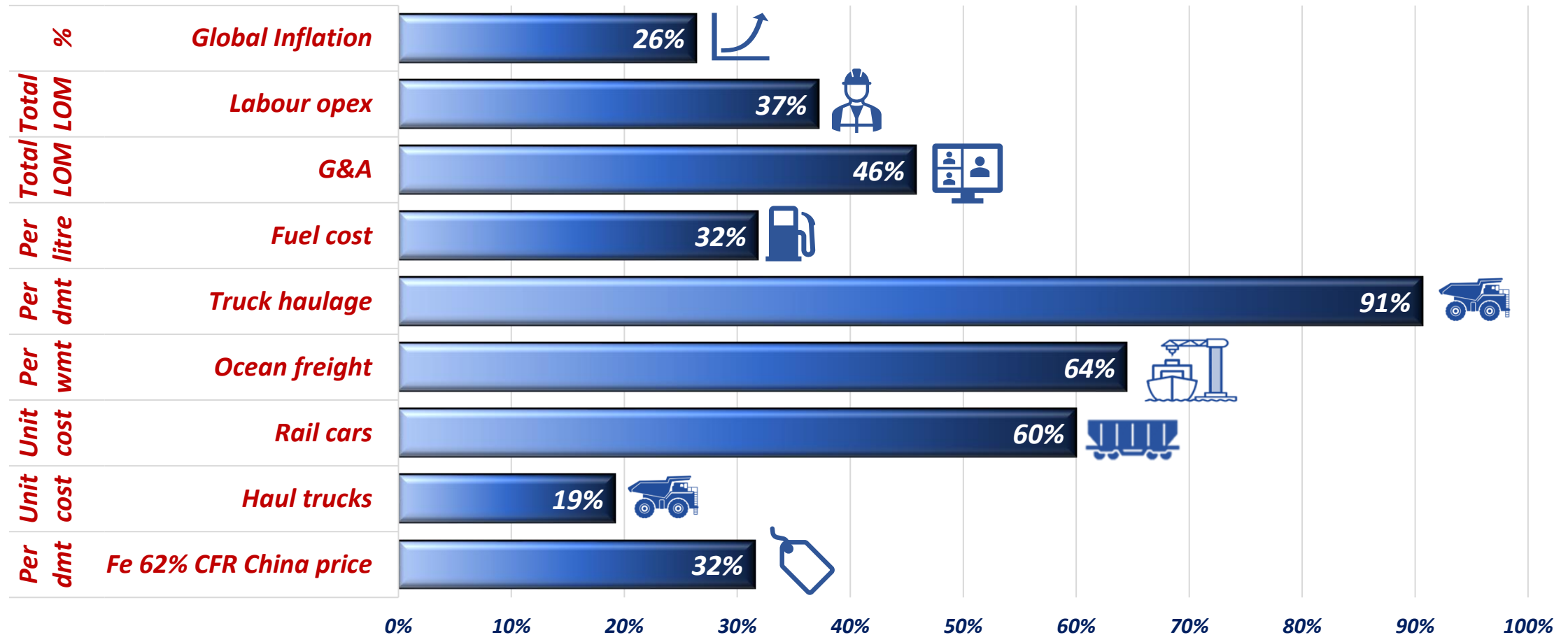
# 2015 vs 2022 Joyce Feasibility Studies

Market Conditions & Actions		Impact on Results	
	<b>Inflation</b>	<i>Substantial cost and price inflation since 2015</i>	
	<b>Iron ore price</b>	<i>Inflation elevates iron prices as well Return of oligopoly sets favourable price dynamics</i>	
	<b>Innovation</b>	<i>Crushing and lump drying strategy reduces moisture for all-season product transportation</i>	
	<b>Improved port conditions</b>	<i>Multi-user dock completed in 2018 with port infrastructure acquired by government</i>	
	<b>Advanced environmental assessment</b>	<i>Compliant draft EIS under federal IAAC technical review and NL initial comment</i>	
	<b>Leasing vs outright purchase</b>	<i>Mobile equipment is leased to reduce initial capital</i>	
	<b>Better project in NPVs &amp; IRRs</b>	<i>Improved project after tax NPV (C\$185M) &amp; IRR (20.01%)</i>	



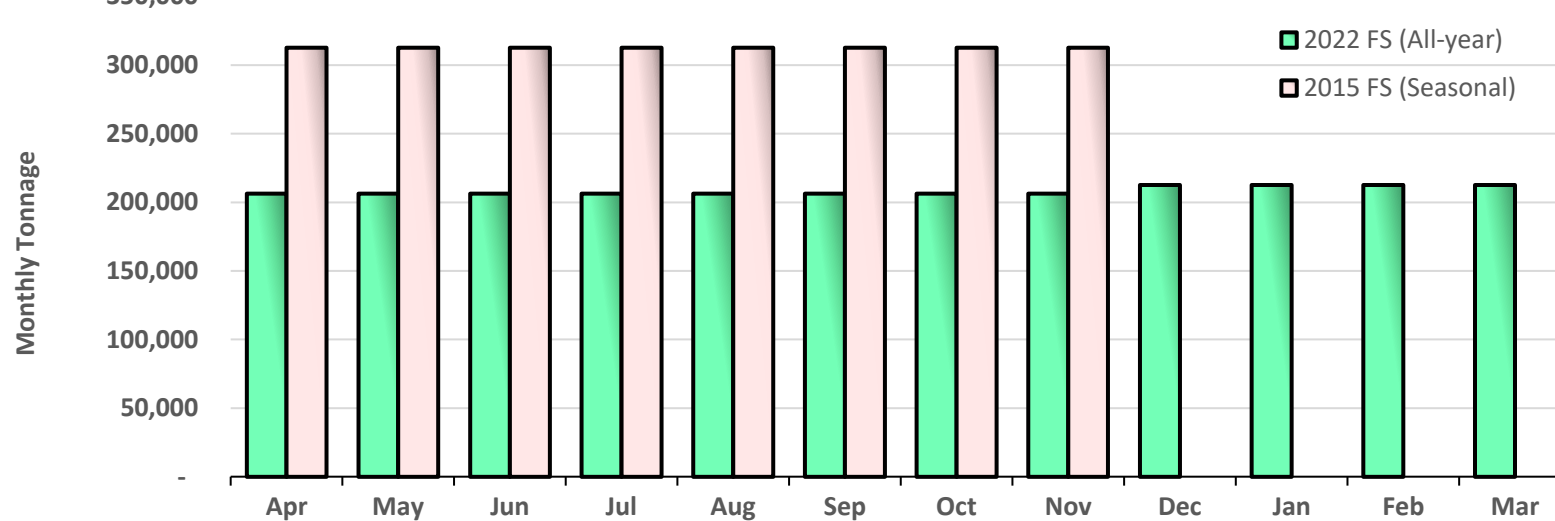
# Inflation Impact: 2015 vs 2022 FS

## 2015 – 2022 Cumulative Cost Inflation impacts of Major Components



# 2015 vs 2022 FS Ore Transportation (2.5Mtpa)

2015 vs 2022 Annual Ore Transportation Distribution Illustration



- All-year transportation of ore in 2022 FS is made possible by drying & stockpiling lump during non-winter months from 4 to 2% for winter transportation
- Substantial opex savings (~\$100M) achieved by mainly avoiding take-or-pay (ToP) penalties and at the rail car off-loading and ocean port facilities
- Capex savings by reducing # of trucks & ore cars with further initial capex savings by leasing vs outright purchase

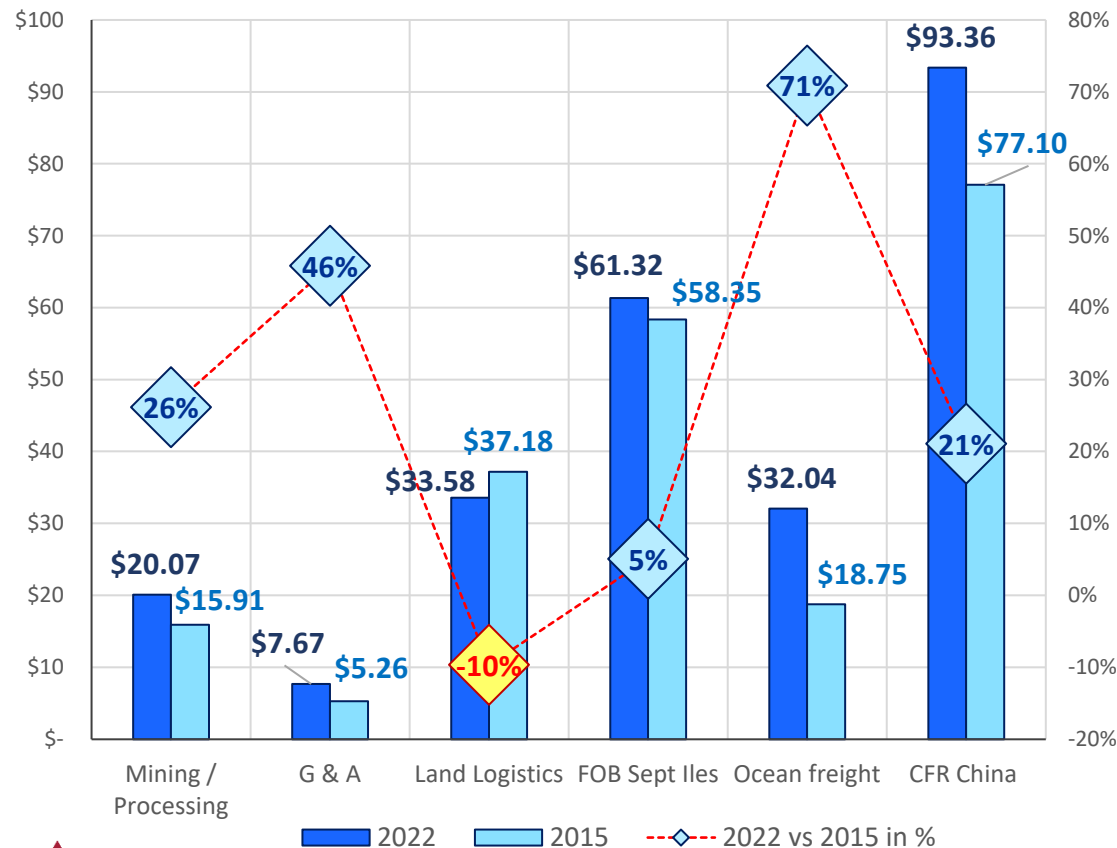
	Non-winter months	Winter months	Capex	Opex
2015 FS	<ul style="list-style-type: none"> <li>▪ Seasonal (~7-8 months) ore transportation</li> </ul>	<b>No transportation (ToP penalties applies)</b>	<ul style="list-style-type: none"> <li>▪ ~500 ore cars</li> <li>▪ 12 haul trucks</li> <li>▪ 6 locomotives</li> </ul>	<ul style="list-style-type: none"> <li>▪ ToP penalty payable</li> </ul>
2022 FS	<ul style="list-style-type: none"> <li>▪ Year-round ore transportation avoiding ToP penalty</li> <li>▪ Thus reducing the # of ore cars, locomotives and trucks required</li> </ul>		<ul style="list-style-type: none"> <li>▪ ~330 ore cars</li> <li>▪ 10 haul trucks</li> <li>▪ 4 locomotives</li> </ul>	<ul style="list-style-type: none"> <li>▪ &lt;\$1/t drying cost</li> <li>▪ No ToP penalty</li> </ul>
2015 – 2022 inflation	<ul style="list-style-type: none"> <li>▪ Ore car unit cost increased by -----&gt;</li> <li>▪ Truck cost increased by -----&gt;</li> </ul>		~60% ~20%	<ul style="list-style-type: none"> <li>▪ Big increases e.g. &gt;30% fuel cost</li> </ul>



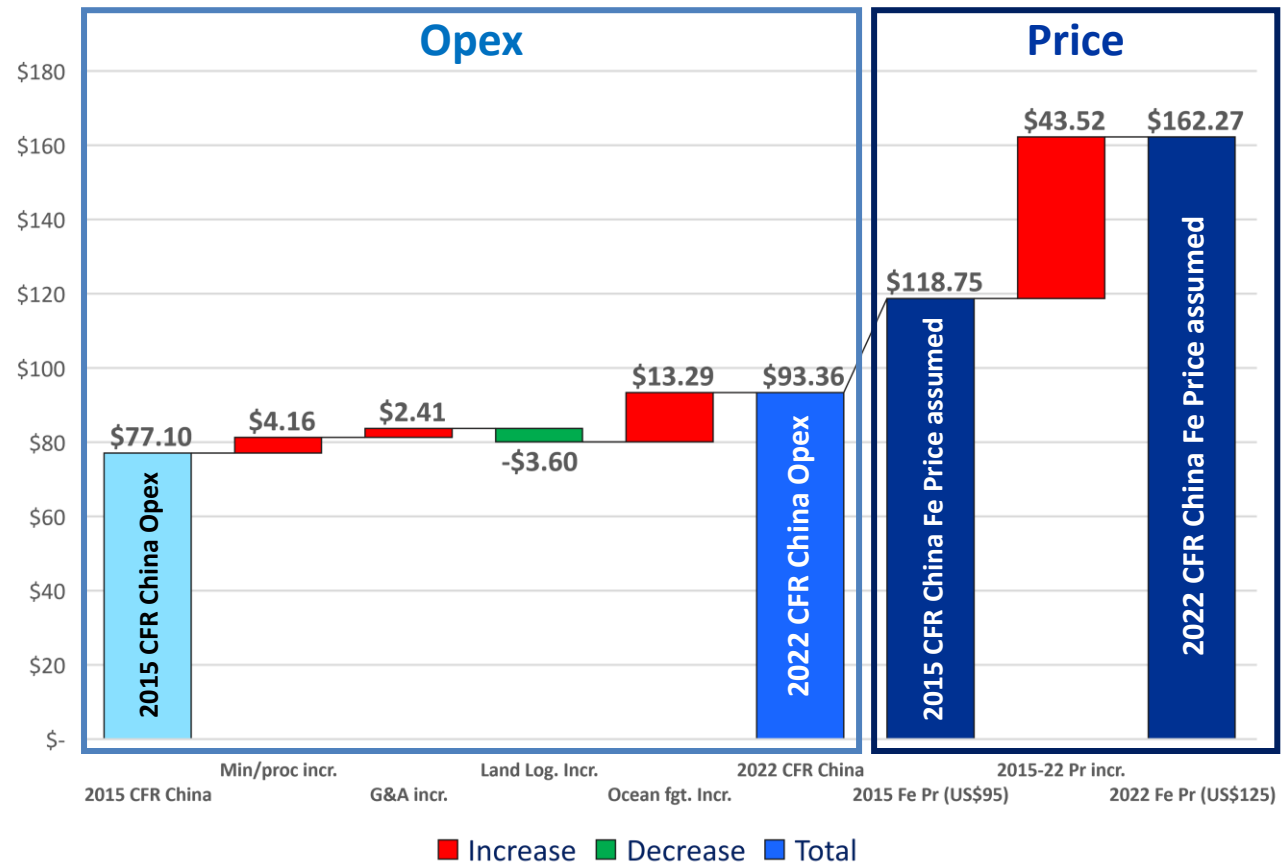
# 2015 vs 2022 Feasibility Opex Changes

To counter high inflationary environment, the project introduces innovative measures making possible all-year product transportation to substantially reduce opex (by drying lump in non-winter months allowing year-round product transportation)

## Changes in Opex (C\$/dmt) between 2015 and 2022



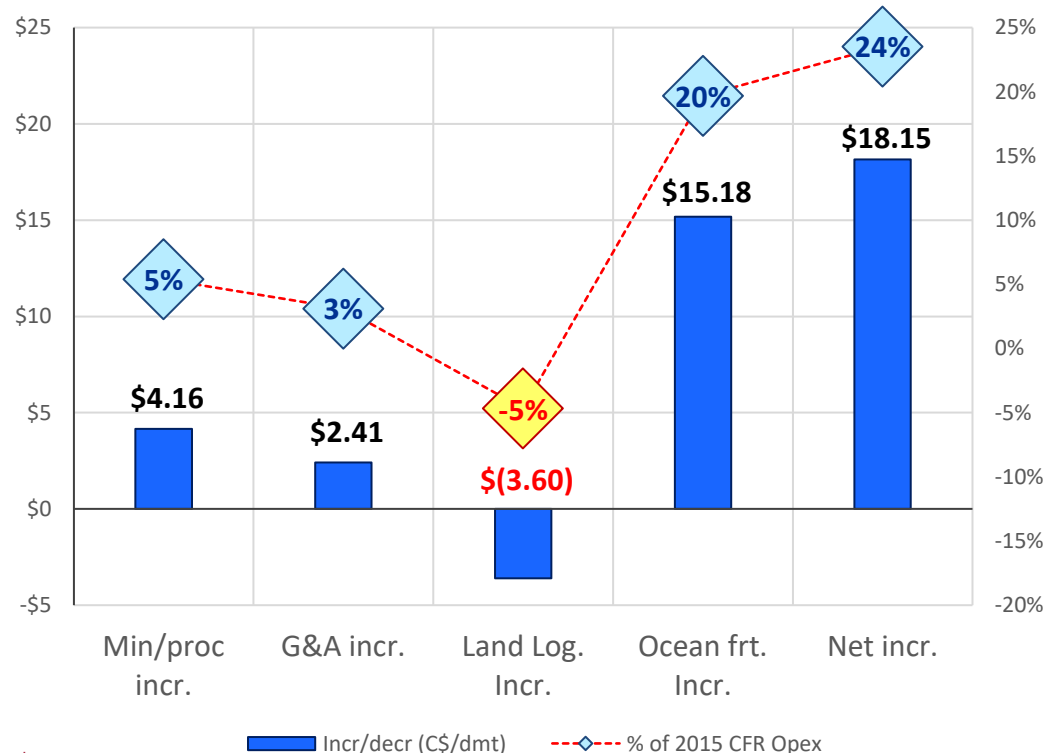
## 2015 vs 2022 Opex and Iron Ore Price Assumption (C\$/dmt)



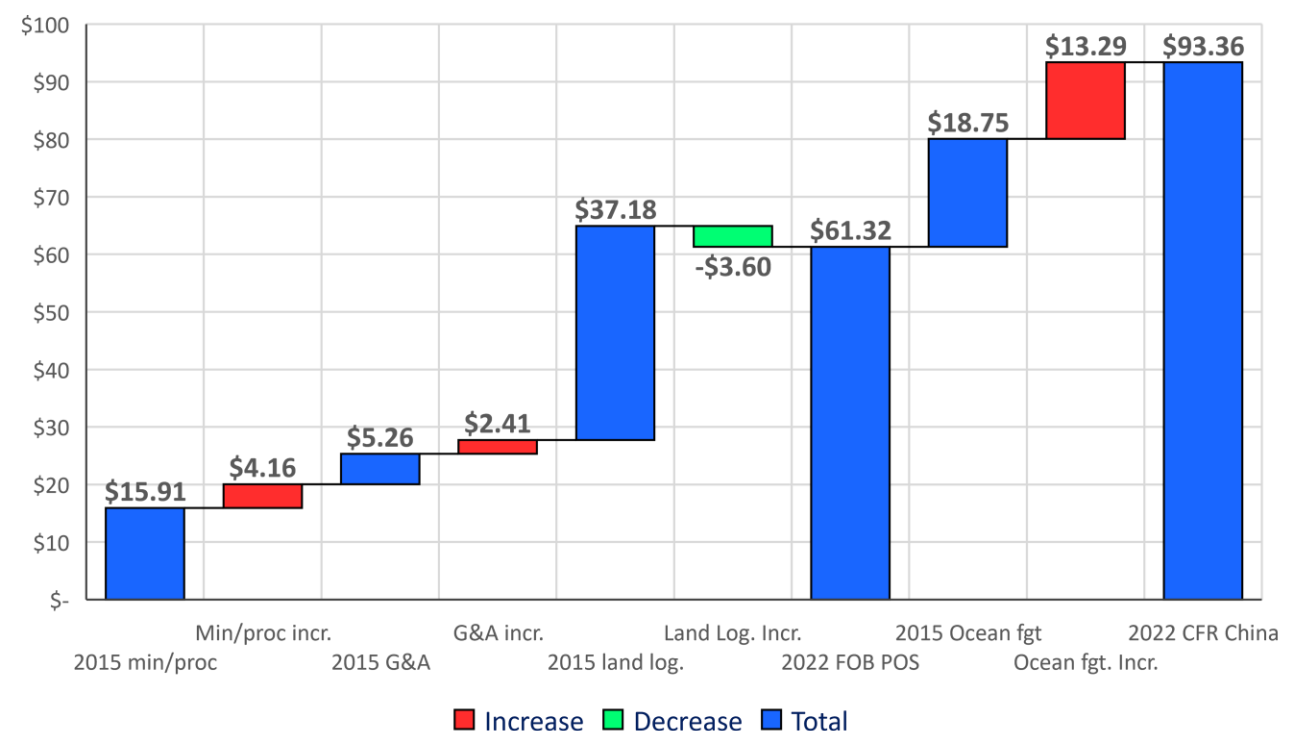
# 2015 vs 2022 Study Opex & Price Changes

*All-year transportation reduces land logistics costs mitigating cost increases due to inflation making Joyce Lake competitive compared to traditional operations in the area*

## Opex Major Component Change Analysis in C\$/dmt

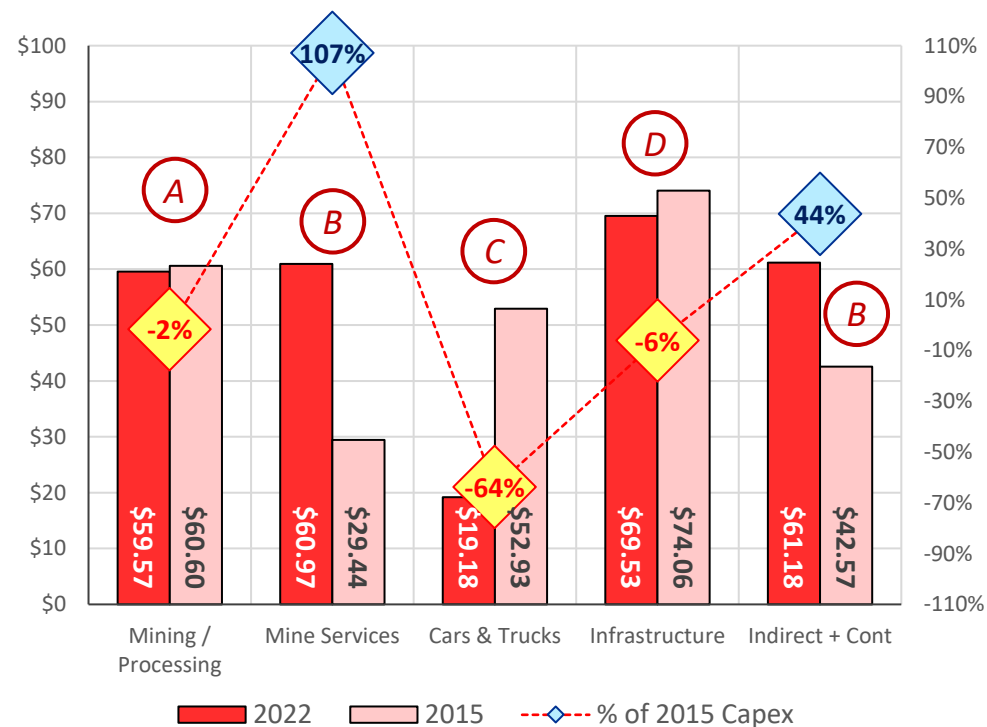


## Changes in Opex (C\$/dmt) between 2015 and 2022

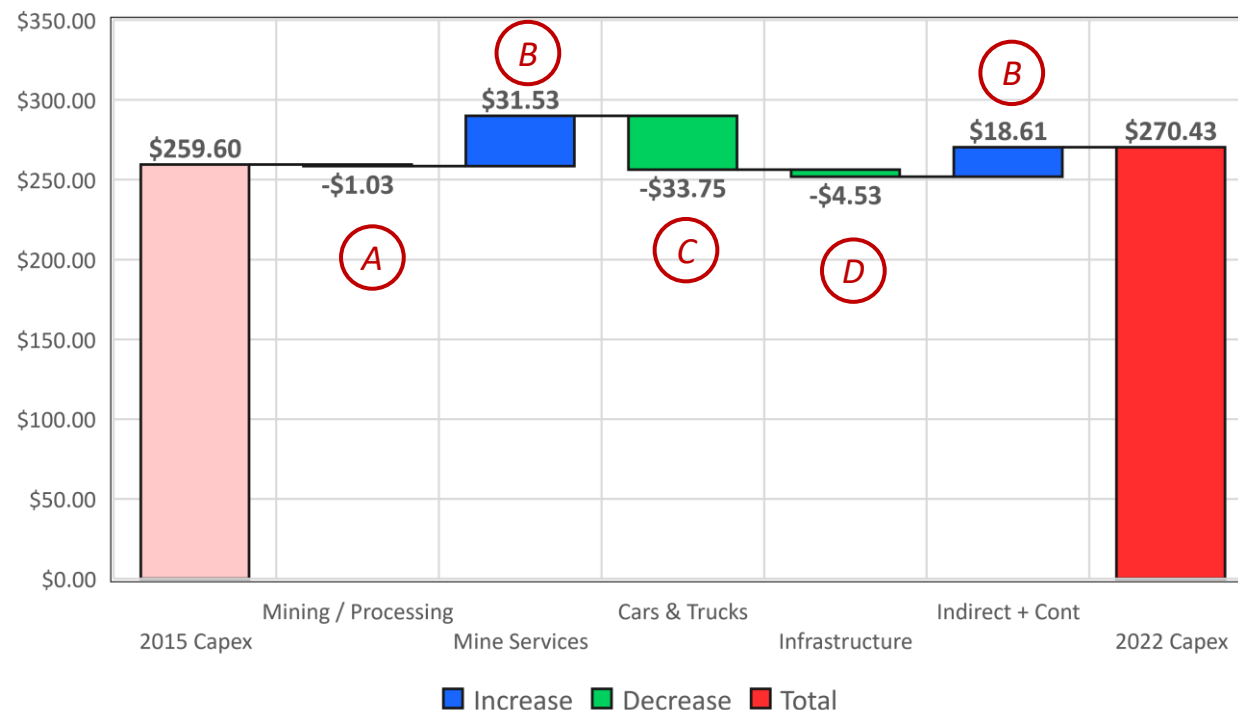


# 2015 vs 2022 Feasibility Capex Changes

## 2015 vs 2022 Major Capex Component in C\$M



## 2015 vs 2022 Capex Component Net Change in C\$ M



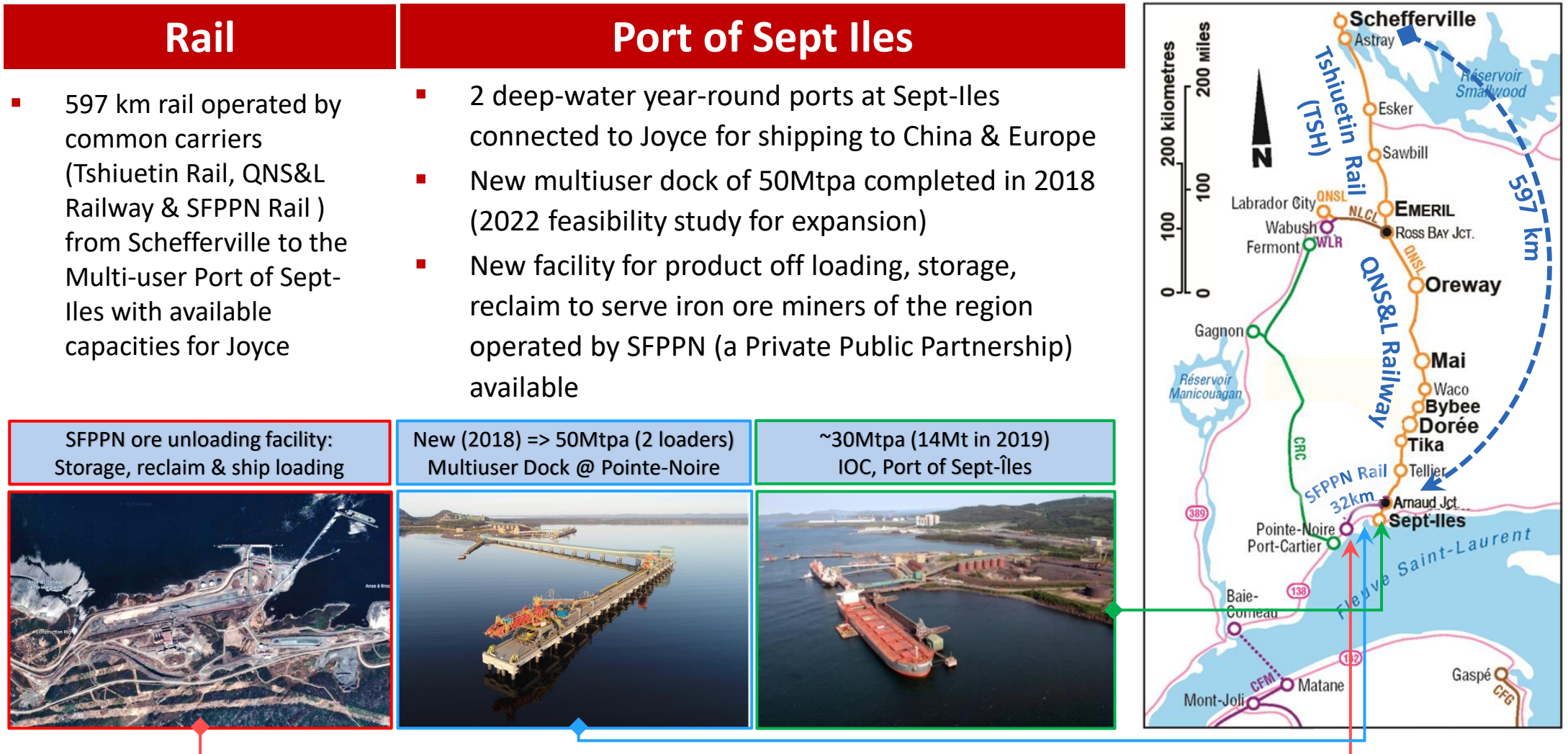
- Notes:**
- A.** Mining initial capex reduced by leasing mining fleet and other mobile equipment
  - B.** Mine service, major indirect and contingency increases are a reflection of the inflationary market environment

- C.** Reduction due to (1) all-year transportation with fewer rail cars & trucks compared to summer only transportation, (2) leasing (vs buying)
- D.** Reduction due to partial single lane design of haul road and rail siding (vs loop) loading plan



# Complete Transportation Infrastructure

*Capesize bulk carrier accessible ports available to ship to seaborne markets*



# Development Roadmap

Major milestones	2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
IAAC (+NL) draft EIS technical review												
Combined (IAAC+NL-ECC) EIS												
EIS public review & decision												
Negotiate IBAs & BAs												
Hydro & geotech tests												
Misc. permitting												
Pre-construction												
Construction												
Production												

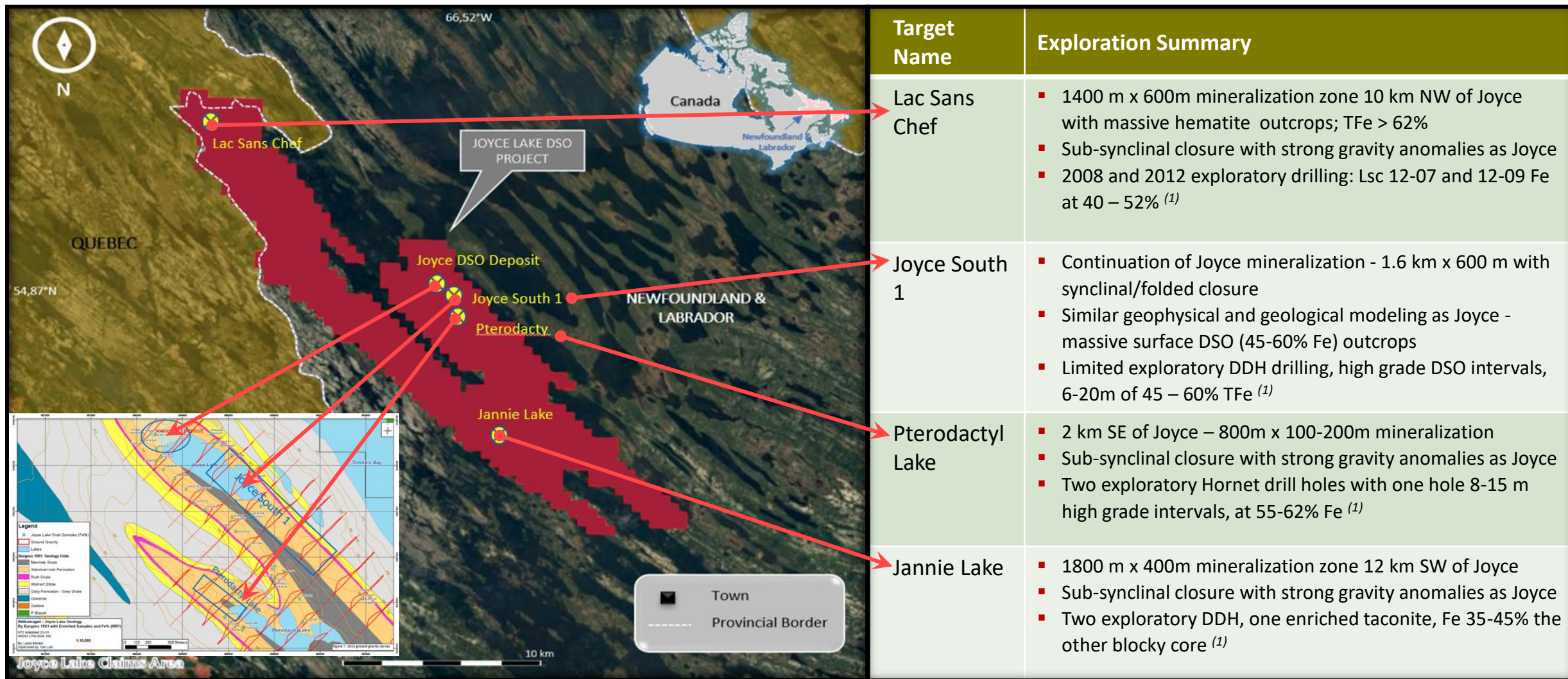
Construction decision window

## Major milestones recently accomplished:



- Feasibility study (published Dec. 13, 2022) ----- ✓
- IAAC compliant EIS submitted & approved (Nov. 2022) for technical review ----- ✓
- NL-ECC guidelines issued (Aug. 2022) ----- ✓
- IAAC extension granted (Jul. 2022) to Dec. 31, 2025 ----- ✓

# Area DSO Exploration Targets at Joyce Lake

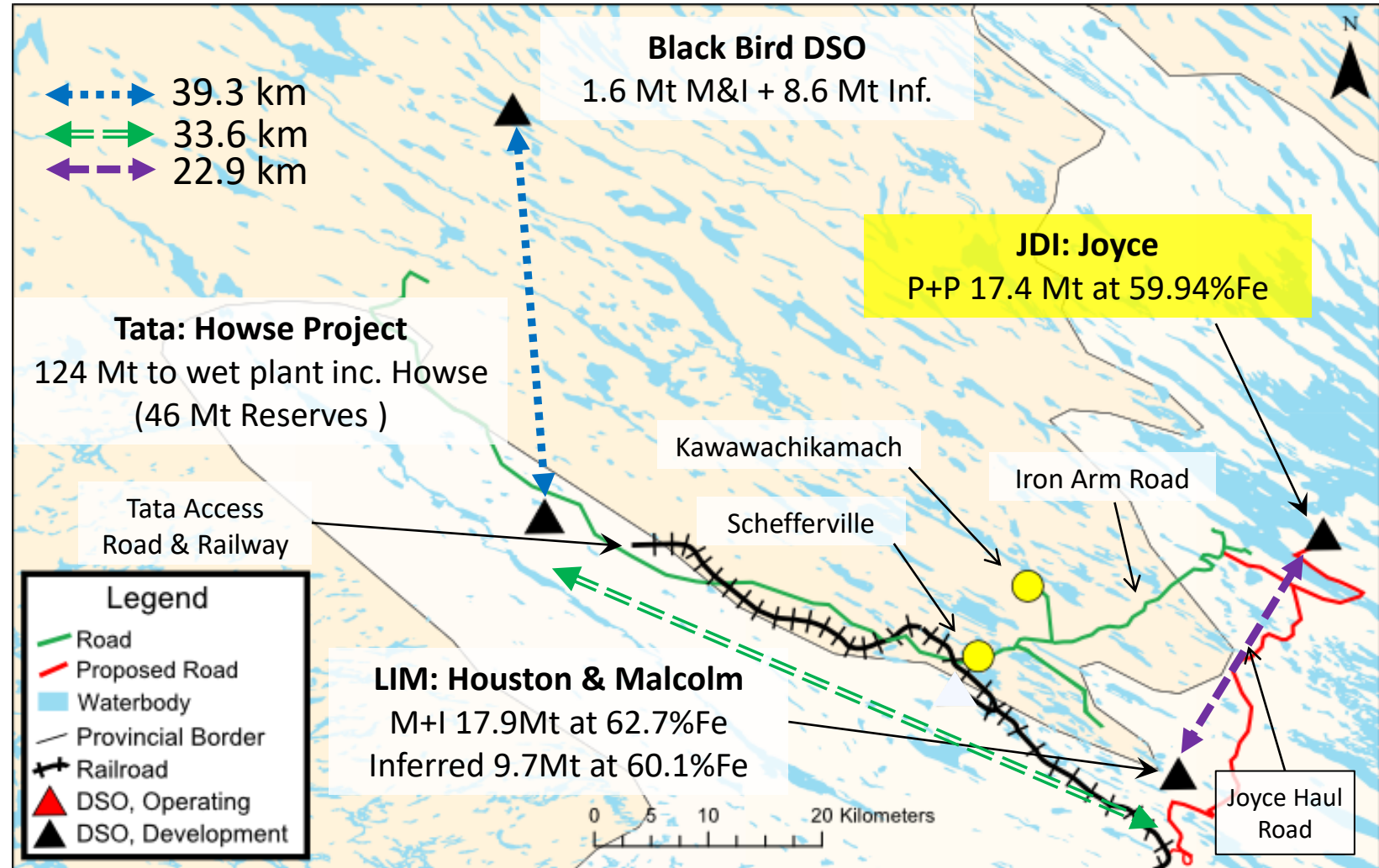


(1) Targets to be further explored with appropriate triple-tube drilling



# Major DSO Deposits in Schefferville District

- *Schefferville was built in 1950s solely for DSO mining as a fully-integrated IOC operation*
- *IOC halted operations in early 80s; various projects have since individually restarted*
- *Three companies currently own DSO properties in the Schefferville area which was operated by one company (IOC)*





# Joyce Lake – Investment Thesis

## Favourable Market Conditions

Strong market fundamentals for seaborne iron ore sector to sustain the average price level it has been trading at over 2022 (~US\$120/t)

- The Big 4 (an oligopoly) supply has been tight with China being the largest user buying 3/4 of global supply. No emerging large disrupting suppliers in view (like FMG in last cycle)
- The Big 4 have paid record special dividends boosting equity value without worrying about keeping capital for expansion – further keeping supply tight
- The spot/futures market initiated by BHP in 2009 is mature and highly liquid with a handful of well established indices drawing financial players to a bulk commodity sector enhancing suppliers' power
- Unlike precious or base metals, iron ore cannot be stocked for typically more than ~30 days (limited by space) – making demand timing highly predictable where suppliers have more room at much less cost to maneuver

## Competitive Advanced Project

Bite-size (C\$270M initial capex) advanced project in an established iron ore region (Labrador Trough, Eastern Canada) well supported by existing infrastructure

- C\$45M invested (over 10 years) in Joyce to date from discovery to development – well drilled and studied – ~\$10-15M more to complete EA process, IBAs and permitting etc.
- Feasibility study (initially completed in 2015) updated by BBA as of December 13, 2022
- Federal Environmental Impact Statement filed and under review – in process of coordinating a harmonized review between the feds and NL to streamline review / approval (~18 months to complete provided no political issues)
- Initial discussions indicate existing rail systems and multi-user port have capacity / capability to handle Joyce tonnage with extended capital contribution