



JORC & Iron Ore Reporting
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The following three deposits are owned by companies raising money –

- As an investor, which one would you invest in?
1. 1,600 Mt @ 69% Fe – good grade, big tonnes
 2. 300 Mt @ 61% CaFe – not bad grade, good tonnes
 3. 200 Mt @ 58% Fe – lowest grade, lowest tonnes





- The JORC Code - Materiality & Transparency in Iron Deposits
 - Deposit type – Mt BIF, He BIF, CID, DID, other
 - Ore mineralogy – Mt, He, Go (V-Mt, Ti-Mt)
 - Deleterious elements – Al, Si, P, S, V, Ti, LOI, etc.
 - Calcined Fe - “CaFe” → Grade Equivalent
 - Direct Shipping Ore versus beneficiation ore – DSO/BFO
 - Cutoff grade versus specification grade
 - Fine/Lump/concentrate - final product
 - Infrastructure and Market
- Basic understanding:
 - Style iron deposits and mineralogy
 - Iron making processes
 - Logistics

Iron ore Minerals

Magnetite

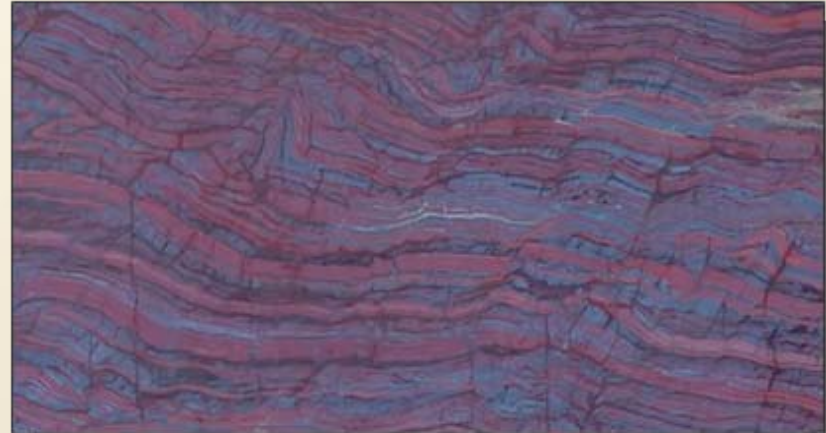
- Fe_3O_4
- 72% Fe & 28% O
- Pellets

Hematite

- Fe_2O_3
- 70% Fe & 30% O
- Lump / Fines

Goethite

- $\text{FeO}(\text{OH})$
- 63% Fe & ~30% O & ~7% H_2O
- Fines
- *Dehydrates to hematite*





- Iron Ore occurs as THREE main deposit types
 - Banded/Bedded Iron Formations (BIF)
 - Channel Iron Deposits (CID)
 - Detrital Iron Deposits (DID)
- Banded Iron Formation (BIF) aka Taconite
 - Magnetite BIF – low grade, requires beneficiation
 - He BIF – high grade, requires little or no beneficiation
 - Pilbara He BIF = “Brockman” and “Marra Mamba”
- Channel Iron Deposits (CID) aka Pisolite, Robe, Yandi
 - Go – He – lower grade – ‘Pisolite’
- Detritals (DID) aka Canga, Scree
 - Eroded remnants of BIF, clay + iron ore (Mt / He BIF)
 - Generally requires beneficiation to remove clay/shales

OTHER DEPOSIT STYLES

- Iron Ore can also be sourced from non-sedimentary styles but these account for a small amount of total iron ore from Australia *but are no less lucrative*
- Magmatic
 - Magnetite forms within cooling magma chamber (Balla Balla)
 - Vanadium, titanium
 - Process also forms Chromium, Platinum deposits
- Skarn – contact metamorphism
 - Magma comes into contact and reacts with surface rock
 - Process also forms tin, tungsten deposits
- Mineral sand deposits
 - modern day and historical beach sands

Iron ore is not so simple!



Magnetite

- Fe₃O₄
- 72% Fe & 28% O
- Pellets

Hematite

- Fe₂O₃
- 70% Fe & 30% O
- Lump / Fines

Goethite

- FeO(OH)
- 63% Fe & ~30% O & ~7% H₂O
- Fines
- *Dehydrates to hematite*

Calcined Fe - CaFe

1,000 kg Iron Ore
 580 kg Fe
 100 kg H₂O CO₂ C

Original Assay

58% Fe
 10% LOI



Volatiles off

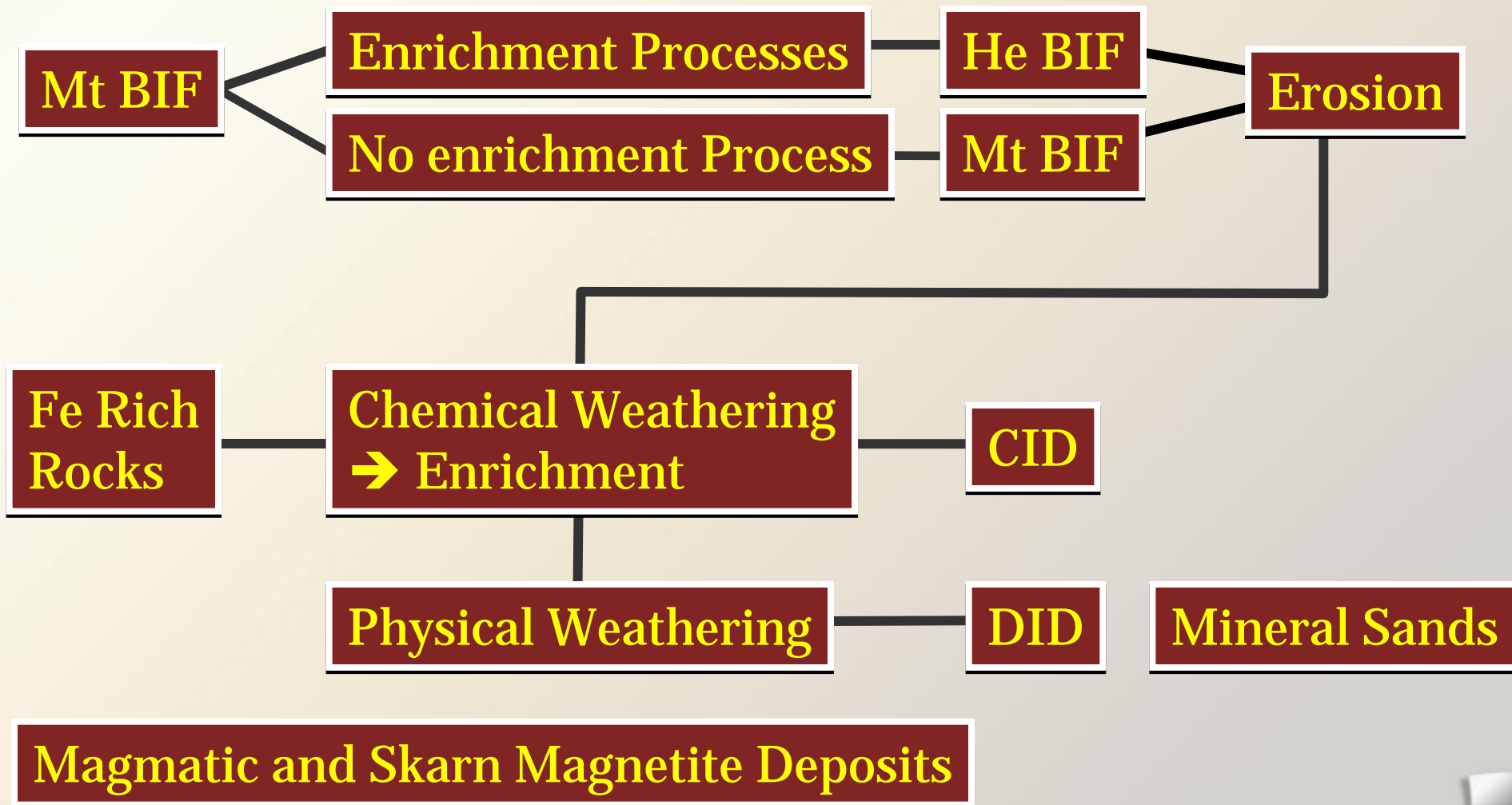
H₂O C CO₂
 LOI = Loss on ignition

900 kg Lump Feed
 580 kg Fe
 580 / 900 = 64%

Calcined Assay

64% Fe

$$\text{CaFe} = \text{Fe} / (100 - \text{LOI}) * 100$$





Iron Smelting

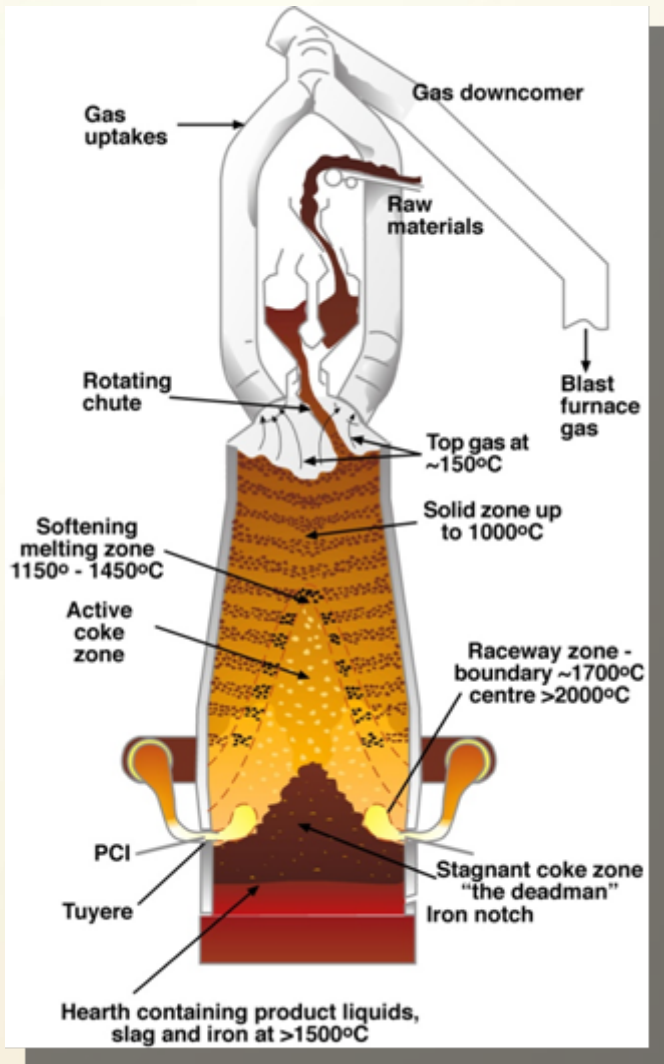
- Iron is main ingredient in steel
- Iron making is carried out in a blast furnace at very high temperatures ($\sim 1400^{\circ}\text{C}$)
- Iron ore (Fe_2O_3) *reduced* to iron oxide (FeO)
- Iron oxide is melted forming molten “pig iron” metal – tapped from bottom
- Molten *slag* removes the waste – *Alumina, Silica, etc.*





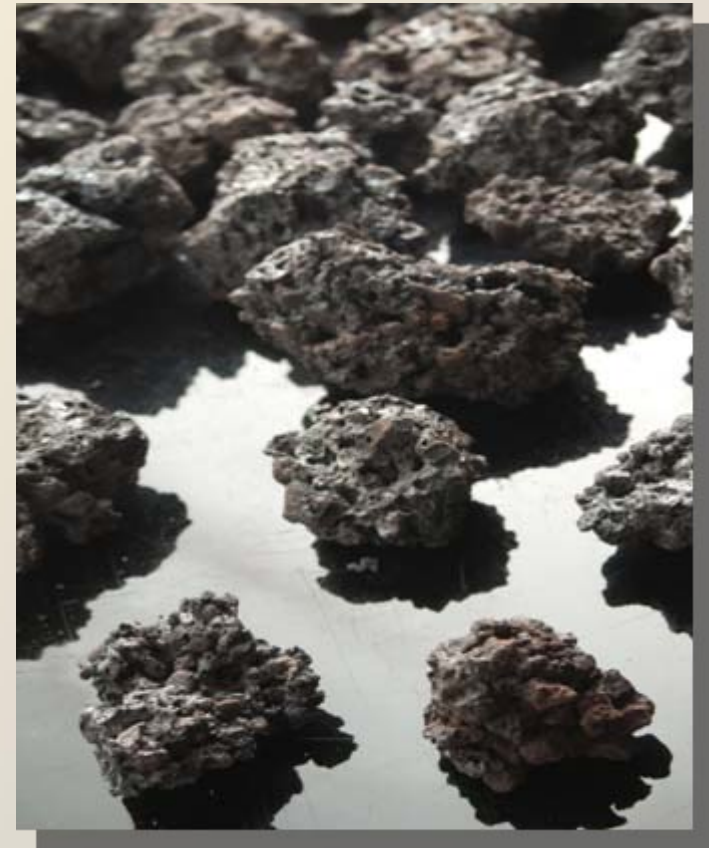
Blast furnace

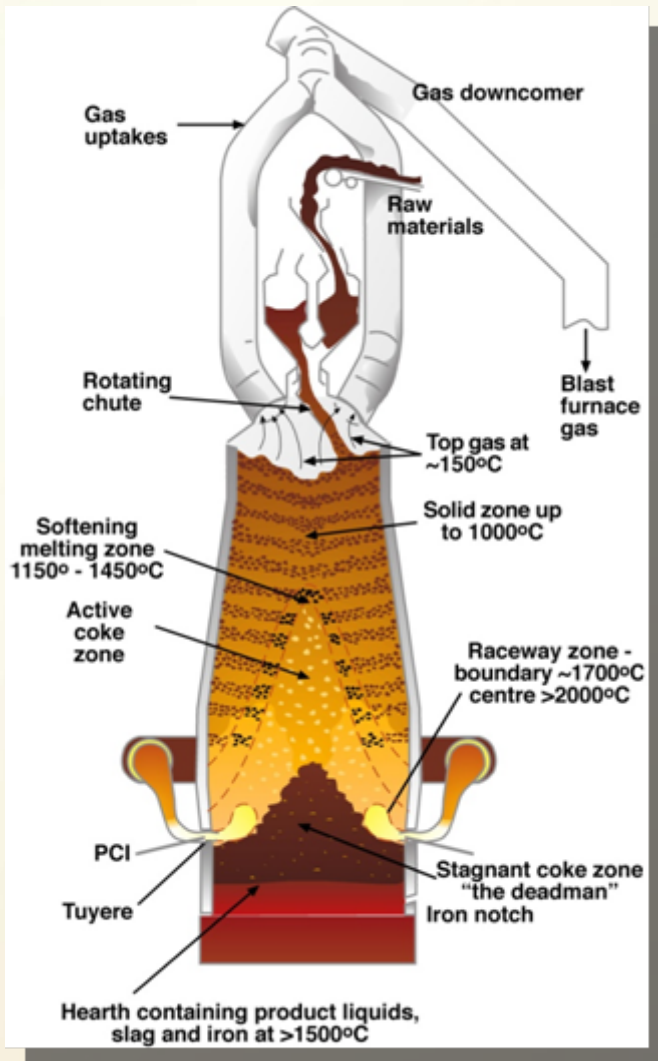
- Iron ore & coal are added at the top in alternating layers – *lump & coke only*
- Hot air is blasted into the bottom of the furnace
- Rising gases provide environment for reducing the iron oxides – $\text{Fe}_2\text{O}_3 \rightarrow \text{FeO}$
- Descending burden melts to create iron metal
- High Al_2O_3 , SiO_2 affect furnace efficiency
- High P affects the steel quality – added costs



Sintering

- All iron ore mines produce a ***lump*** (6 – 30 mm) and a ***finer*** (< 6 mm) product
- Only lump ore can be used in the blast furnace
- Synthetic lump is made by from *finer* by high temperature agglomeration - ***sintering***
- Optimal physical properties of the **sinter** are required for use in the blast furnace
- Sinter test → ***pyrometallurgy***





Deleterious Elements

- Al_2O_3 – affects furnace efficiency → slag
- SiO_2 – affects furnace and iron → slag/steel
- P – affects steel → steel
- LOI – affects fuel use, water in hot furnace
- Other elements affect chemistry of slag/steel
- Options for steel makers include:
 - Flux – prevent formation of undesireables
 - Blending high DE ores with low DE ores
 - Further processing



Element	CID	He Lump	He Fines
Fe	57 – 58.5	61 – 65	58- 64
SiO ₂	3 – 6	4 – 6	3 – 4
Al ₂ O ₃	1.3 – 2.7	1.3 – 2.0	1.3 – 2.0
P	0.04	0.03 – 0.08	0.05 – 0.08

Direct Shipping Ore - DSO

- Hematite/Goethite which only requires simple screening and crushing
- Little or no beneficiation or upgrade – simple screening undersize
- DSO should be at or near to accepted specification or ‘Spec’ – *may be sold as blend*
- Lump/Fines assumptions are important – sub 60% ore is normally crushed to fines



Element	Head Grade	Conc. Grade	Recovery	Head Grade	Conc. Grade	Recovery
Fe	36	69	37% by weight	41	70	43% by weight
SiO ₂	39	4		36	2	
Al ₂ O ₃	0.1	0.01		0.4	0.1	
P	0.09	0.01		0.09	0.01	

Magnetite BIF

- Occurs as low grade but very large deposits – but very high grade final product
- Beneficiation by magnetic separation after fine grinding
- Requires significant infrastructure at mine and port
- Produces an ‘ultrafines’ product requiring agglomeration ‘pelletising’



Infrastructure

- Iron ore is shipped as a bulk commodity
- Most iron ore is shipped to offshore customers
- Requires train/road/pipeline to port for shipping

Marketing

- Australian iron ore shipped to Japan, China, Korea
- Increasing counter party risk with offshore customers
- Value-in-Use – Revenue determined by grade, deleterious elements and pyrometallurgy
- Value adding – pelletising, pig iron, etc.
- Current pricing uncertain and price & ForEx assumptions are important



Total Mineral Resource Estimate – March 2009

DSO Resource Estimate

Class	Mt	Fe	CaFe	SiO ₂	Al ₂ O ₃	P	S	LOI ₁₀₀₀
Measured	1.7	57.0	64.8	3.49	2.15	0.018	0.016	12.0
Indicated	38.6	57.0	64.7	3.15	2.09	0.016	0.011	12.0
Inferred	10.4	57.0	64.8	3.27	2.00	0.013	0.010	12.1
TOTAL DSO	50.7	57.0	64.8	3.19	2.07	0.015	0.011	12.0

CID Resource Estimate

Class	Mt	Fe	CaFe	SiO ₂	Al ₂ O ₃	P	S	LOI ₁₀₀₀
Measured	2.2	54.5	62.1	4.94	3.65	0.018	0.017	12.1
Indicated	68.8	54.0	61.8	4.48	3.08	0.017	0.011	12.7
Inferred	18.1	54.7	62.3	4.27	2.85	0.013	0.018	12.1
TOTAL CID	89.1	54.1	61.9	4.45	3.05	0.016	0.013	12.6

- The DSO resource estimate is a subset of the CID resource
- DSO resource reported at 57% Fe specification grade
- LOI at 1000C – CaFe = (Fe / (100-LOI)) * 100

BC Iron reporting guidelines – resources and exploration results

- Iron deposit type is identified
- DSO reports Fe with significant deleterious elements
- CaFe reported together with Fe, LOI and CaFe formula
- Term 'high grade' is only used for material at upper end of 'typical spec' grade bands
- Specify whether Fe cutoff or spec grade is being used
- Clear indication of the likely final product – lump, fine, sinter blend
- Magnetite reporting to include head grade, concentrate grade and recovery

The following three deposits are owned by companies raising money –

➤ As an investor, which one would you invest in?

1. 1,600 Mt @ 69% Fe (Concentrate – 34% Fe in Mt BIF)
2. 300 Mt @ 61% CaFe (Fe 54.9%, LOI 10%, Al₂O₃ 3.4%)
3. 200 Mt @ 58% Fe – (1.8% Al₂O₃, 0.06% P)

Answer?

1. Depends on your risk profile....



This release may include forward-looking statements. These forward-looking statements are based on management's expectations and beliefs concerning future events. Forward-looking statements are necessarily subject to risks, uncertainties and other factors, some of which are outside the control of BC Iron Limited, that could cause actual results to differ materially from such statements. BC Iron Limited makes no undertaking to subsequently update or revise the forward-looking statements made in this release to reflect events or circumstances after the date of this release.

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Consenting Persons Statement

The information relating to the terms "iron ore", "exploration target", "direct shipping ore", "conceptual pits" and "upgrade" should not be misunderstood or misconstrued as an estimate of Mineral Resources and Reserves as defined by the JORC Code (2004) and therefore the terms have not been used in this context. It is uncertain if further exploration or feasibility study will result in the determination of a Mineral Resource or Mining Reserve.

The information that relates to the drilling data and geological interpretations is based on information compiled by Michael Young who is a Member of The Australian Institute of Geoscientists and a Director of the Company. The information that relates to the Mineral Resource Estimate has been compiled by Mr Richard Gaze who is a member of the Australasian Institute of Mining and Metallurgy and an employee of Golder Associates. Both Mr Young and Mr Gaze have sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity that they are undertaking to qualify as a Competent Persons as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Gaze and Mr Young consent to the inclusion in their names in the matters based on their information in the form and context in which it appears.



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