### Ludvika Mines – Not an Iron Ore Adventure Platts SBB 2<sup>nd</sup> Annual Steel Making Raw Materials Europe

Amsterdam September 28, 2012





## Nordic Iron Ore at a glance

- An iron ore mine development company based in Ludvika, 200 km away from Stockholm
- Established in 2008 through contribution in kind of 12 exploration assets from Kopparberg Mineral AB, Archelon Mineral AB and IGE Nordic AB
- Two out of three main projects are brownfield mines with significant expansion potential between these two mines
- Mining concessions granted and environmental permit application submitted for the brownfield mines
- New improved mine plan being developed for 4.4Mt/y product following internal scoping study
- Production start in late 2015





### Today's agenda

- I. Project highlights
- II. Market overview
- III. Ludvika Mines
- IV. Project financials
- V. Management
- VI. Summary



## **Project Charateristics**

#### **Experienced management**

- Management and Board of Directors with long track record from mine development and steel operations as well as extensive iron ore market knowledge
- Extensive experience from logistics and public development projects

#### Low environmental impact

- Underground mine with minimal environmental impact
- Inert tailings and low impurities from operations
- Classified as low environmental risk by the county administrative board (Länsstyrelsen)



#### High quality iron ore

- High grade/quality iron ore product
- Premium pricing for high Fe-grade
- High processability



## Large mineralisation with unique expansion opportunity

- Väsman a significant expansion opportunity
- Connecting the two brownfield mines creating one whole area of mineralization with economies of scale

#### Brownfield project – existing infrastructure

- Extensive knowledge of mine and product characteristics from previous operations
- Benefits from re-using existing mine infrastructure
- Mine concession approved and environmental application submitted

#### **Competitive logistics and OPEX**

- Centrally located with modern logistics
- Existing rail link to Oxelösund deep water port
- USD 130m (SEK 900m) committed by the government for railway upgrade
- Reduced logistics CAPEX and a highly competitive OPEX

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- VII. Q&A



### Demand for crude steel follows long industrial trends

Crude Steel Production 1900 – 2011



 Demand for iron ore is highly correlated with global steel production (98% of the iron ore supply is used in steel production)



### Developing countries drive demand

Population vs. GDP per capita



#### Chinese steel growth still has a long way to run

- High demand for commodities due to increased build-out in infrastructure
- Critical necessity for infrastructure growth and a vital component in the manufacturing value chain



# Challenges of bringing on new supply will support attractive price levels

## Forecast supply additions relative demand growth

Forecast supply additions relative to anticipated 20 year demand growth (2000 to 2020)



## Share of iron ore prospects realised



High end cash cost curve supportive for high prices



- Pricing will be partly driven by the pace of the supply response
- Far from all announced additional capacity is being realised
- Chinese margin producers usually have very high OPEX costs



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## Overview of mines and exploration target

## Brownfield mines with a sizable expansion opportunity and existing railway



## Mining concessions and exploration permits



### Exploring one of Sweden's largest iron ore assets



Project:	Blötberget	Håksberg	Väsman	Total
Indicated, Mt	14 Mt (43% Fe)	25 Mt (36% Fe)	-	39 Mt
Inferred, Mt	10 Mt (43% Fe)	12 Mt (36% Fe)	-	22 Mt
Exploration Target, Mt	-	-	600-650 Mt (29-30% Fe)	600-650 Mt



## Overview of Blötberget project

- Resources generally open at depth and sideways
- Mining concession granted 2011
- Submitted application environmental permit July 2012 (+Håksberg)
- Historical cut-off grade ~30 % (lowest economic mineable grades)



#### Next steps:

- Infill drilling program of 9,000 m
- Metallurgical tests
- Process layout

Mineral resources (Mt)			
	Indicated	Inferred	
<ul> <li>Tonnage</li> </ul>	14	10	
<ul> <li>Grade (Fe)</li> </ul>	43%	43%	



## Overview of Håksberg project

- Resources are generally open at depth
- Mining concession granted 2011<sup>1</sup>
- Submitted application environmental permit July 2012 (+Blötberget)
- Historical cut-off grade ~30 %



#### Next step:

- Infill drilling program
- Metallurgical tests
- Process layout

#### **Mineral resources (Mt)**

	Indicated	Inferred
<ul> <li>Tonnage</li> </ul>	25	12
<ul> <li>Grade (Fe)</li> </ul>	36%	36%



1) The Mining Inspectorate's decision to grant a mining concession for Håksberg has not yet become final since the decision has been appealed by local residents in the area. The matter will be decided by the Government

## Håksberg Crude Ore Terminal (2,2 mtpy case)





### Processing plant and terminal in Skeppmora (Blötberget)





Processing plant designed for expansion possibility

1) mtpy = million tonnes per year

## Väsman – Significant expansion opportunity

- World-class exploration target
- 600-650 Mt magnetite defined (19-47%Fe), average of 29% Fe
- Additional hematite to be defined ~20%
- Opportunity to increase mine output to 4.4 Mt/y



#### Next steps:

- Ongoing drilling program of 10,000m
- Application for mining concession (Q1, 2013)
- Pre feasibility study (PFS) 2013

#### Historic exploration:

- Magnetic field mapping
- 22 drill holes from surface and 26 drill holes from shaft and 280m level
- Full scale process tests 8,000 tonnes producing high grade concentrate



### Väsman Expansion Target







#### Summary of historical exploration during 1957-64

- Magnetic field mapping
- 22 drill holes from surface
- 26 drill holes in explortaion mine at shaft and on 280 meters level
- 8000 t crude ore mined
- Full scale process test yielded fines grade:
  - 65% Fe,
  - 0,02%P,
  - 0,02% S



## **Development alternatives and integration plans**



1	<ul> <li>Production start of Blötberget in late</li></ul>
2 3	2015 up to a rate of 2.2Mt/y
To be	<ul> <li>Tunnel extension to Håksberg via Väsman</li> </ul>
nvesti-	<ul> <li>Volumes added from Väsman from</li></ul>
gated	as early as 2016 towards 4.4Mt/y
	<ul> <li>Significant capex and environmental savings calculated (no Håksberg rail</li> </ul>



#### Further investigations needed for value optimisation

terminal etc.)

### **Project milestones**



## Key differentiators to other iron ore projects





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### PEA of Brown Field Project (2,2 mdmt)



#### **PEA pricing and margins**

#### **PEA** investment budget

#### **Price assumptions**

- Long-term iron ore price of USD 120/dmt
- Premium of USD 5 per Fe % unit >62 %, as forecasted by RMG
- Assuming no value-in-use premium
- USD/SEK exchange ratio of 7.0

	2013	2014	2015	2016	Total to full production
CAPEX (SEKm)	784	1,584	533	123	3,024
CAPEX (USDm)	112	226	76	18	432
		-γ	J		

CAPEX to first production and revenue USD 338m

	SEKm	USDm	
NPV (8%)	2,907	415	_
IRR	24%	24%	
Payback time <sup>2</sup>	4.0	4.0	



### **Competitive project characteristics**



Peer group cash cost adjusted for Fe %<sup>1</sup>

#### Comparison of average % Fe<sup>2</sup>



- Competitive OPEX compared to similar projects
- OPEX adjusted for Fe % to get comparable costs

 Premium product with high Fe-grade and high processability



1) USD 5/%Fe above or below 62% Fe. P = in production, c=in construction.. Dannemora's and Northland Resources OPEX is adjusted to USD/SEK exchange rate of 7.0 Note: Average OPEX may change. 2) Source: Company reports. Note: Averages may change as new projects are initiated.

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### Experienced management in place



#### Christer Lindqvist, Chief Executive Officer

MSc in Metallurgy, Royal Institute of Technology

- Former Director/Project Manager of Dannemora Mineral AB
- 25 years experience from various managerial positions, including ABB, Åkers and STC Interfinans
- Chairman of Kopparberg Mineral AB, Terra Mining Ltd Botswana, Malmköpings nya Spritbolag AB
  - Board member of the Advisory Board of Kanon AB and AEG Bioetanol spz.o.o



#### Lennart Eliasson, Chief Financial Officer

MBA, Uppsala University

- Authorised Public Accountant 1985
- Partner at KPMG 1989, audit engagement partner in public and private enterprises and specialist in corporate finance and transaction services
- Deputy Board Member of the subsidiary Ludvika Gruvor AB. Sole trader of LE Advisory



#### Paul Marsden, Technical Sales and Marketing Director

BSc, Geological Sciences from Aston University, Chartered Engineer, Chartered Scientist

- 33 years of experience in iron ore product development with a wide range of technical and commercial skills and strategic knowledge of iron ore mine and steel industry developments
- Most recent position as Vice President of Business Development at Northland Resources AB
- Qualified Person according to IMMM (Institute of Metals, Minerals and Mining)



#### Louise Sjögren, Chief Geologist

MSc in Earth Sciences, University of Gothenburg

- 9 years experience from exploration and mining geology most recently from Boliden
- Experience within exploration of Zn-Pb-Ag and Cu-Au from a number of Swedish mining sites
- Certified risk analyst
- Part of the management team for mining work training at a national level



#### Hans Thorshag, Technical Director

MSc in Mining, Royal Institute of Technology

- 36 years of experience in underground mining and construction as Project Manager and Mining Specialist at LKAB, Boliden, Midroc Gold and Lundin Mining
- Iron ore mine development experience
- Appointed "Qualified Person" by the Swedish Mining Association (SveMin)
- Board member of HT Mineral AB and partner in Mining and Milling HB

#### Supporting technical consultants

Project management, technical and financial studies



Geological studies







Logistical studies





#### **Board of Directors**



#### Ulf Adelsohn, Chairman of the Board Bachelor of Law, Stockholm University

- Director of the Swedish Trade Council
- Former Minister of Transport & Communication, former Mayor of Stockholm, former Governor of Stockholm, former Chairman of SJ and former leader of the Swedish Conservative Party



#### Göran Ekdahl, Director

Bachelor of Law, Stockholm University

- Founder and partner of Gedda & Ekdahl law firm, now Bird & Bird Sweden
- Former secretary to the Board of LKAB
- Former Director of Fundia AB



#### Jonas Bengtsson, Director MBA. Stockholm University

- Partner of BTAB Invest
- CEO and Director of Stenbe Fastigheter AB
- CEO and Director of Dala Press AB
- Director of Bengtssons Värdepapper AB



#### Lars-Göran Ohlsson, Director

MSc in Mining, Royal Institute of Technology

[Pictures available?]

- CEO and Director of GEO-Management AB
- Director of Kopparberg Mineral AB
- Former CEO of Dannemora Mineral AB
- Former CEO of Riddarhyttan Resources AB, LKAB Prospektering AB, and Swedish Geology AB



#### Per Storm, Director

Mining Engineer, tech. Licentiate and Tech. Doctor, Royal Institute of Technology, and MBA

- CEO of Kopparberg Mineral
- Chairman of the finnish public limited company Ecca Nordic
- Former CEO of Raw Materials Group
- Former Executive VP of Royal Swedish Academy of Sciences



#### Anders Bengtsson, Director

MBA. Monterrev Institute of International Business

- CEO. Director and owner of DIMITRA AB
- Partner of BTAB Invest
- Director of Bengtssons Värdepapper AB



#### Johnas Jansson, Director

- Founder & Owner, Elbolaget i Ludvika Montage
- Director Elbolaget Produktion AB



- CEO, Lemont Maskin AB
- Chairman Mercapto AB
- Chairman Datorama AB



Christer Lindqvist, CEO & Director

MSc in Metalllurgy, Royal Institute of Technology

See Management



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## Risks & Mitigation – Ernst & Young's Top 10 (2012)

#### Key concerns

**Resources Nationalism** 

**Skills Shortage** 

**Infrastructure Access** 

Maintaining Social Licence to Operate

**Capital Project Execution** 

**Price & Currency Volatility** 

**Capital Allocation** 

**Cost Management** 

Interruptions to Supply

#### Fraud & Corruption



#### **Risk mitigation**

Sweden resource development friendly, low sovereign risk, competitive infrastructure and cost

Long history of mining and engineering to service mines in the region, close to Stockholm

Mine located next to high capacity national rail system, access to dry bulk cargo ports

Support from community and industry incl finance, environmental awareness and corporate governance

Experienced management in iron ore development in region, CAPEX inflation low

Sensitivity analysis in PEA indicated project sufficiently robust to cope with currency volatility

Capital intensity low for high margin product, alternative capital outlay to S.A, AFR, AUS and Asia

Experienced management aware of input costs, low reliance on oil, low costs for logistics

Strong existing infrastructure, alternative routes to market, security of supply

Sweden low corruption country, stable and established mining and environmental codes

# Mineral potential is worthless if the region is not mining friendly



### Ludvika Mines – a low risk industrial project





## Thank you

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