



**KGHM**

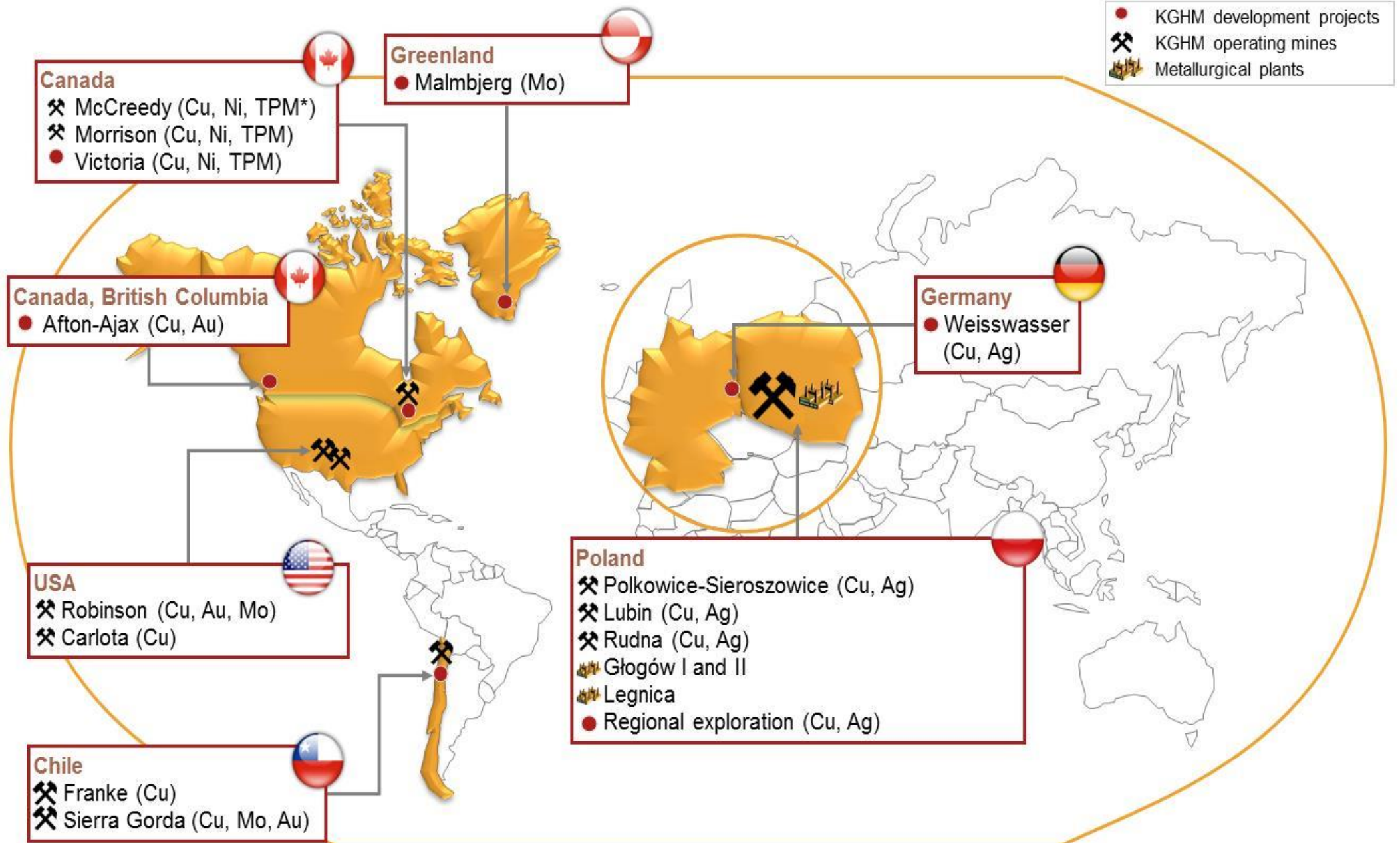
POLSKA MIEDŹ S.A.

# Sierra Gorda

## Start of production

4 August 2014

## KGHM has commenced copper production at its Sierra Gorda mine



\* TPM – precious metals

## KGHM opens a mine in Chile – copper, gold and molybdenum

**64**

**K OUNCES**  
of target annual  
**GOLD** production

**220**

**K TONNES**  
of target annual  
**COPPER** production

**25**

**M POUNDS**  
of target annual  
**MOLYBDENUM** production



## Sierra Gorda – project history



**2004**

Project acquired by Quadra FNX to explore for an oxide ore deposit

**2006**

Discovery of sulphide ore deposit

**2009**

Preliminary feasibility study

**2010**

Full feasibility study begins, environmental impact study submitted to authorities

**2011**

Required permits received, sale of 45% share of project to Sumitomo and start of mine construction

**2012**

Quadra FNX acquired by KGHM and start of pre-stripping

**2013**

Mine construction – 78% completed

**2014**

Completion of pre-stripping and mine construction, start of handover and production

# Sierra Gorda – a world-class copper project with substantial molybdenum and gold

## Ownership

55% KGHM  
45% Sumitomo

## Resources

~1463.3 Mt @ 0.4% Cu  
0.02% Mo, 0.065 g/t Au

## Mine type

Open pit

## Mine life

23 years

## Capital expenditure

~\$4 billion

## C1 cost

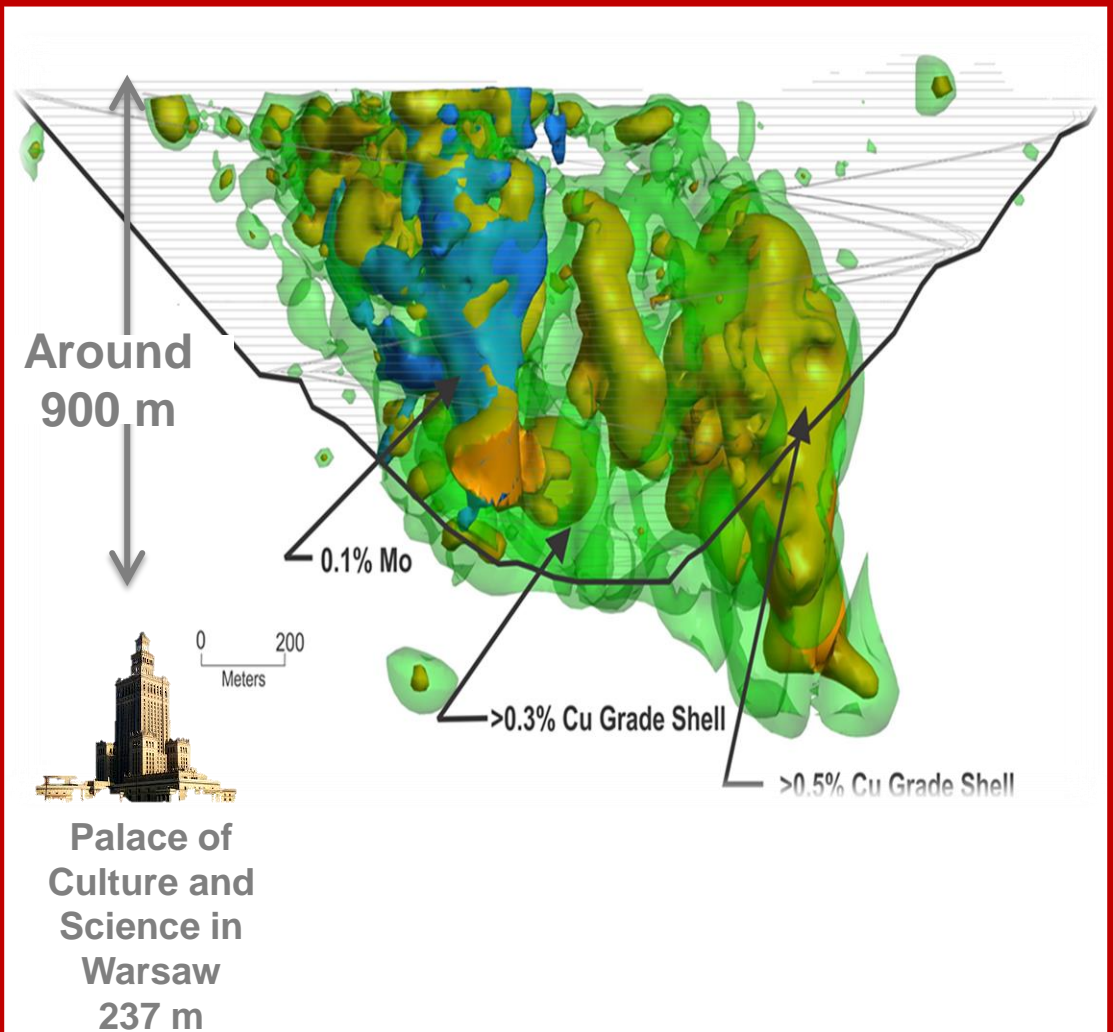
\$2 500/t  
(during the first five years of operation)

## Target production

220kt Cu

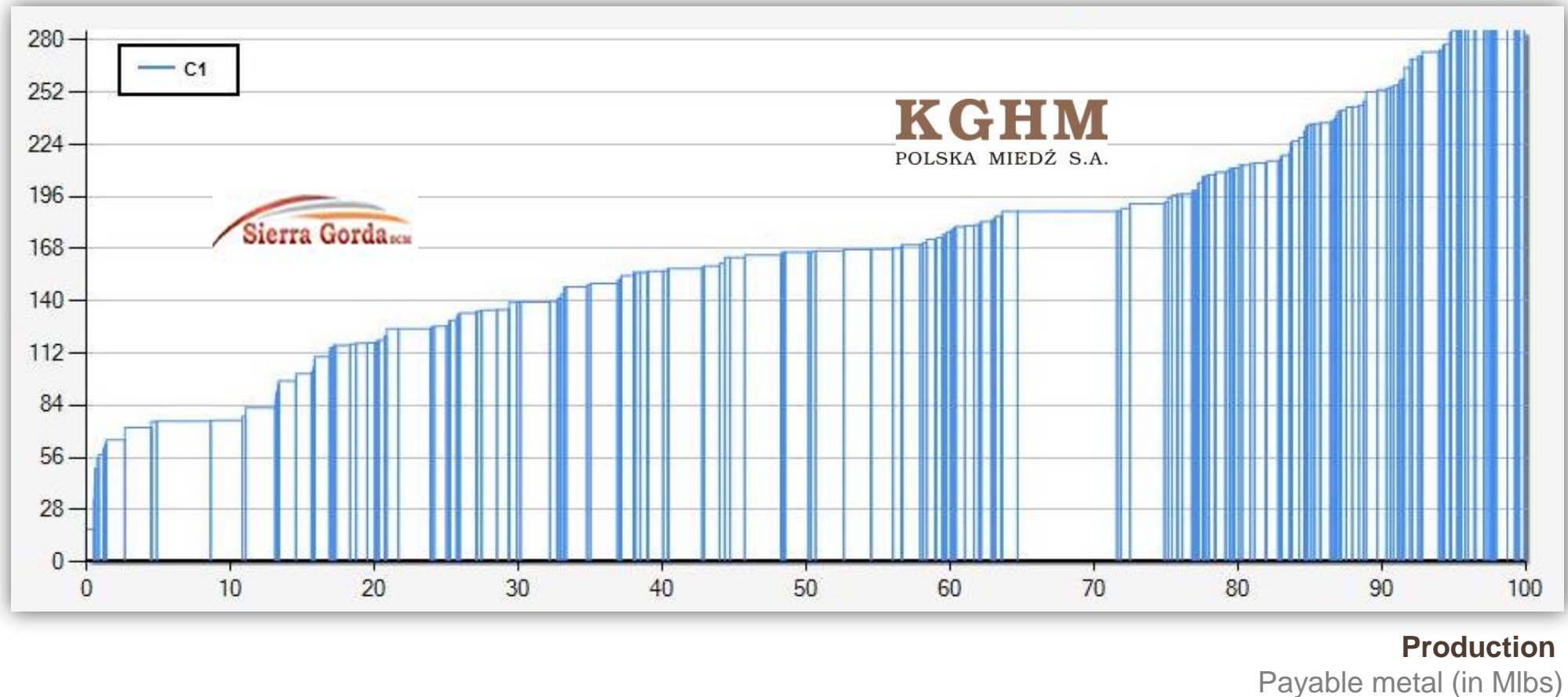


## Target pit diameter approx. 2.5 km



## Sierra Gorda – a low-cost mine

Copper production cost curve in 2015  
USDc/lb



**In its first years of operation, Sierra Gorda will be in the first quartile of the global cost curve, with a cash cost of 1.13 USD/lb.**

## Sierra Gorda – a world-class mine project

- **4th-largest** mine project in the world<sup>1</sup>
- Target daily processing of **190 thousand tonnes of ore**<sup>2</sup>
- Project located at a height of **1 700 m a.s.l.**
- At the peak of construction around **10 000 people** were employed
- Annual ore extraction would fill the national stadium in Poland **80 times**



The project is located 4.5 km from the town of Sierra Gorda in the Atacama desert, in Region II, northern Chile – the most important area in the country in terms of copper production.

<sup>1</sup> SNL-MEG, 2014

<sup>2</sup> per technical report

## Sierra Gorda – snapshot of the pit



- Ore is currently being extracted 180 m below surface level
- Target pit diameter 2 500 m
- Target pit depth 900m



## Overview of the major equipment used at the Sierra Gorda mine



### Komatsu 930E truck

Haulage capacity	303 tonnes
Length	15.6 m
Height	7.4 m
Width	8.7 m
Number	38



### CAT Finning 7495 shovel

Shovel capacity	To 90 tonnes
Length with shovel	28 m
Height	20.1 m
Width	13.01 m
Number	5

## Overview of the major equipment used at the Sierra Gorda mine



### LeToruneau L-2350 loader

Shovel volume	40.5 m <sup>3</sup>
Length	20.9 m
Height	6.5 m
Width	7.6 m
Number	1



### CAT 6640 driller

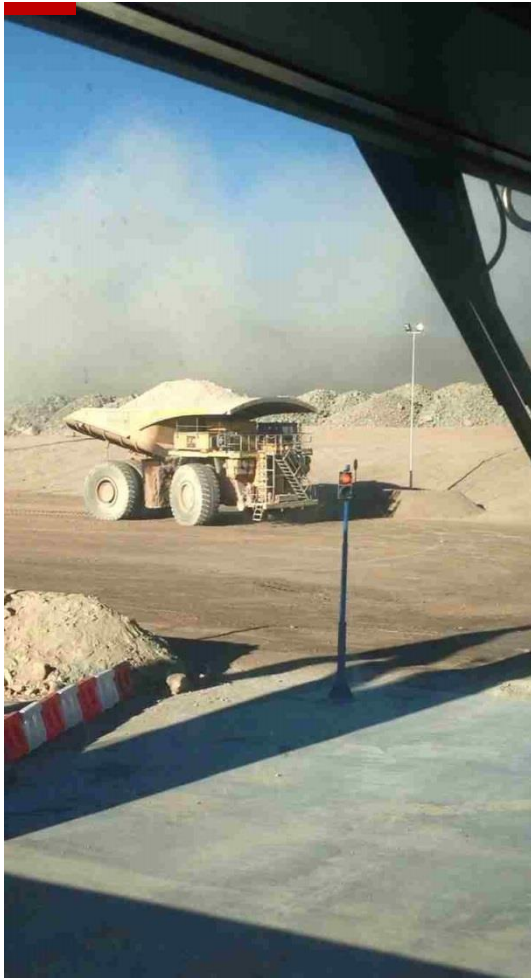
Max drilling diameter	To 16 inches
Height with mast	31 m
Width	6.08 m
Length	6.7 m
Number	4



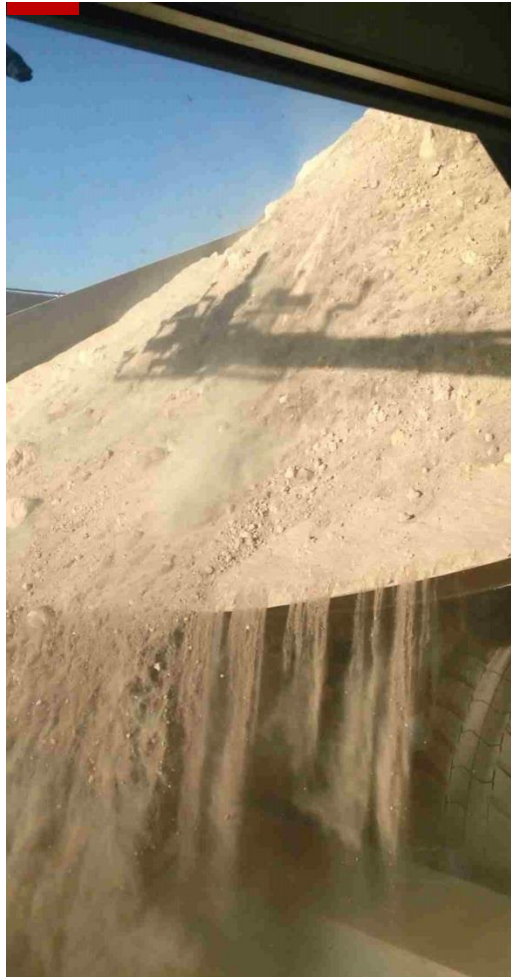
### AtlacCopco PV351 driller

Max drilling diameter	To 16 inches
Height with mast	31.6 m
Width	8.1 m
Length	16.4 m
Number	1

## Ore removal and initial crushing



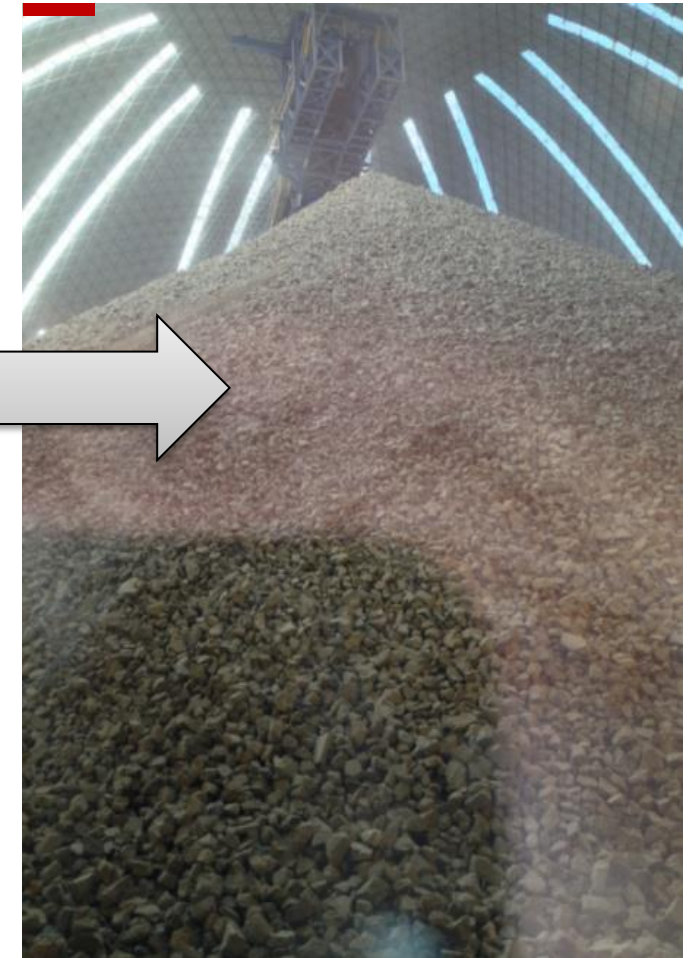
First load of ore delivered by  
KOMATSU truck to primary  
crusher



Primary crusher

## Coarse ore stockpile facility

### First sulphide ore stored



- Storage capacity 180 kt
- Facility height 61m
- Number of exit belts – 4

## Conveyor belts/ Secondary screeners/ Secondary and Terciary Crushers



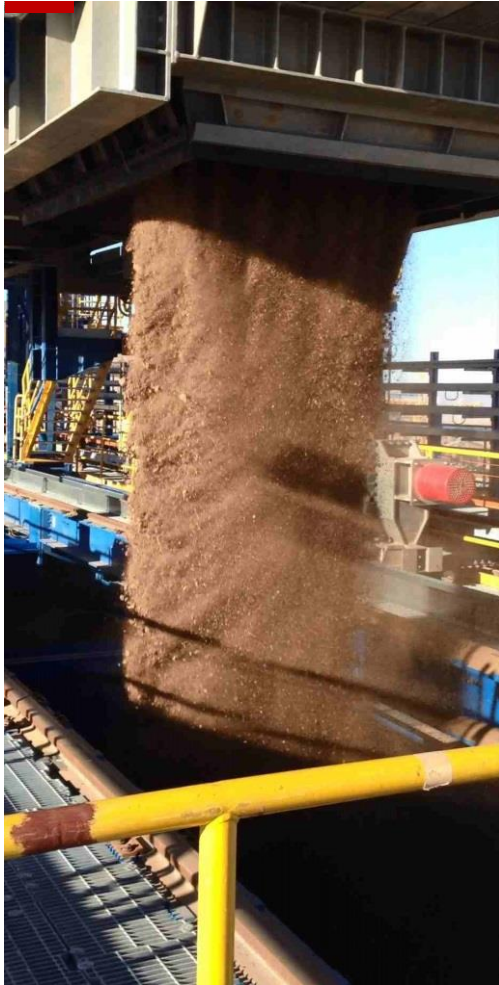
Secondary screener



Secondary and Terciary Crushers

- **Transport of ore from the coarse ore stockpile facility to the fine ore bins over the secondary screener via a CV-120/130 conveyor belt**
- **Material classified by mechanical screening**
- **Material crushed using secondary and terciary crushers**
- **Transport to the fine ore bins**
- **During operation the installations are controlled by the central control facility**

## Conveyor belts / Secondary screeners / Secondary and Tertiary Crushers



CV-150 conveyor belt, transport of ore to secondary crushing retention bin



CV-160 conveyor belt with the first load of fully-crushed ore being transported to the fine ore bin



Secondary crusher in operation



Lighted conveyor belts in operation

## Ball mills/ Flotation / Concentrate thickening



Ball mills (also visible: conveyor belts and tertiary crushers)



Concentrate thickener (max capacity 3,800 m3)



Primary/Cleaning Flotation



Cu concentrate filtration installation

## Sea water pipeline and pumping station/ Sea water reservoir



Sea water pipeline and pumping station



Sea water reservoir with capacity 750 thousand m<sup>3</sup>



## Tailings facility



Tailings facility dimensions 4 x 6 km,

## Sierra Gorda is a well managed, innovative project, with substantial potential for development

- 1** Sierra Gorda is a well managed project ... 

  - **International staff**, managed **by staff from Poland**
  - **Strong partner in Sumitomo**, highly experienced in advancing similar projects
  - **SG is the largest infrastructural project being advanced in Chile**

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- 2** ... innovative... 

  - Modern technology is being applied at SG, such as high pressure grinding rollers (HPGR)
  - SG is building **the world's largest molybdenum plant**
  - Sea water pipeline measuring **143 km long and approx. 90 cm diameter**

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- 3** ... providing opportunities for Polish companies 

  - SG is buying **materials and equipment from Polish companies**
  - Close cooperation with scientific centers in Poland, including Wrocław University of Technology and KGHM Cuprum
  - **KGHM supports the international expansion of Polish companies**, especially in Chile, such as through the organisation of economic seminars and the Think Tank POLAND, GO GLOBAL! Forum initiated by KGHM

## Potential for increasing the value of Sierra Gorda

### Oxide ore



- Apart from the planned processing of sulphide ore, Sierra Gorda also has substantial resources of oxide ore.
- Semi-industrial tests are currently underway, whose results will be used to develop a project feasibility study.

### Photovoltaics



- KGHM is analysing the possibility of building a photovoltaic farm, which would provide 20% of the annual power needs of the Sierra Gorda mine.

### Reserves



- The implemented technical optimisation enabled an increase in available reserves by 15%, from 1 275 million tonnes to 1 463 million tonnes.

### Exploration



- Once Sierra Gorda commences operation, a campaign of exploratory drilling is planned in the potential areas directly adjacent to the project.

## Opening of the I. Domeyko Sierra Gorda mine in Chile



Thank you

