

# **Hautalampi Cobalt-Nickel-Copper Mine Project**

**Revitalisation of the Outokumpu Mining  
Camp**

**Aiming to produce Traceable and Responsible  
Co-and Ni-chemicals for the battery industry**



# Disclaimer

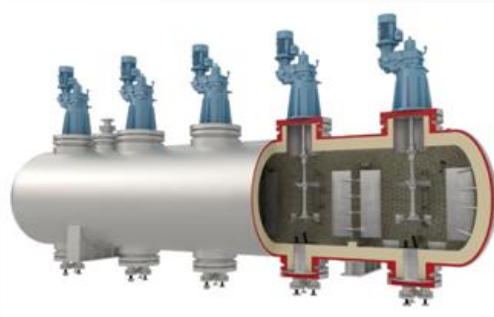
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*Such risks and uncertainties include fluctuations in metal prices, unpredictable results of exploration activities, uncertainties inherent in the estimation of mineral reserves and resources, fluctuations in the costs of goods and services, problems associated with exploration and mining operations, changes in legal, social or political conditions in Finland, and lack of appropriate funding, all of which could, among other things, prevent any of the forward-looking statements in this news release from coming to fruition or lead to a delay in the commencement of mining operations.*

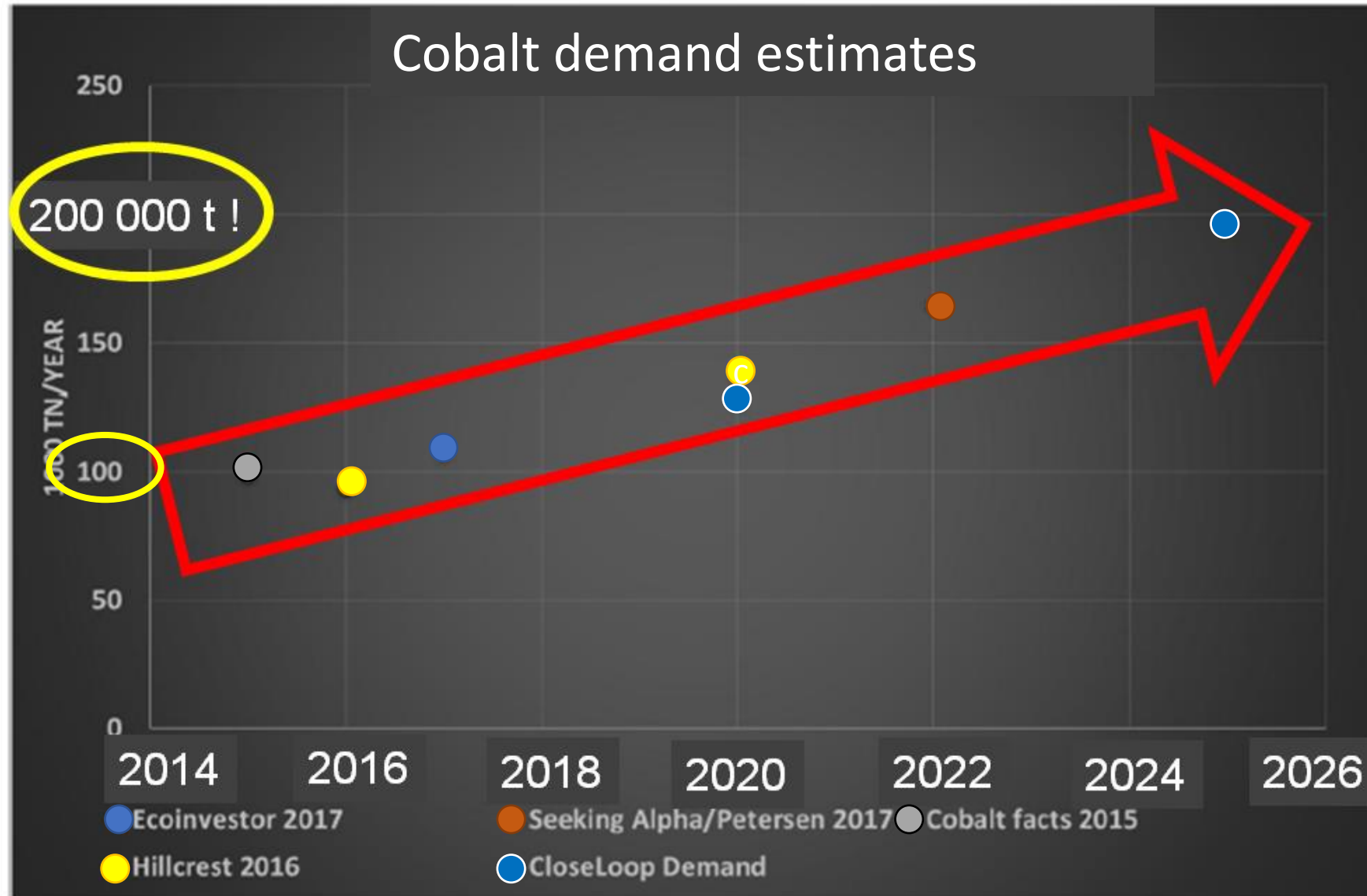
*This statement is prepared by Mr. Markus Ekberg (Eurogeologist), a person qualified under the terms of Canadian National Instrument 43-101.*

# Business Idea

- Develop and mine Hautalampi Co-Ni-Cu mine
- Benefit from previous investments for the project:
  - sunk cost 10 - 15 M€
- Significant pre-production development completed:
  - an 850 metre decline and 1,250 metres underground development
- Produce and upgrade Co-Ni-concentrate to technical or battery-grade chemicals by leaching
- Produce conventional Cu-concentrate for smelting



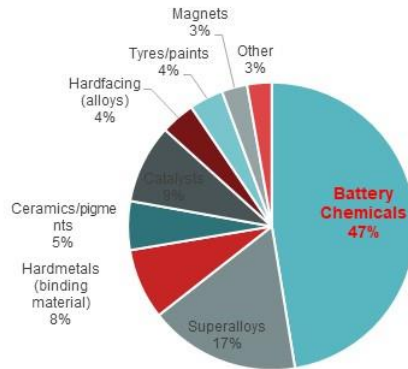
June 13<sup>th</sup> 2018 Roskill: Cobalt Demand in Batteries Set to Grow at 14.5%py to 2027, raising total demand from 118,000t/yr to 310,000t/yr by 2027



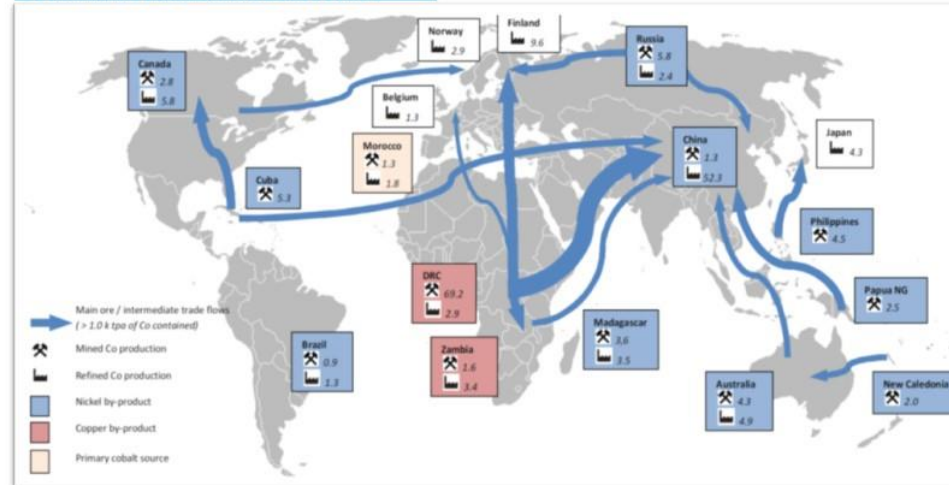


## Cobalt Cathode

Demand For Cobalt By Application



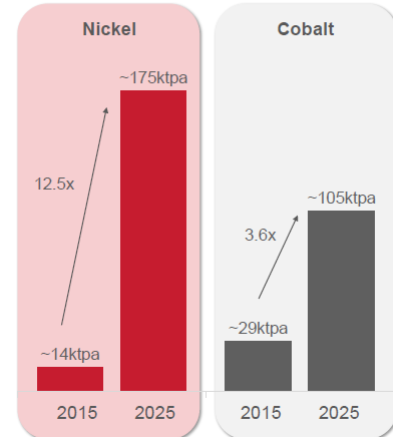
Cobalt Mined And Refined Production



CORE CONSULTANTS | 2017

Core Consultants

## Implied Contained Metal Demand

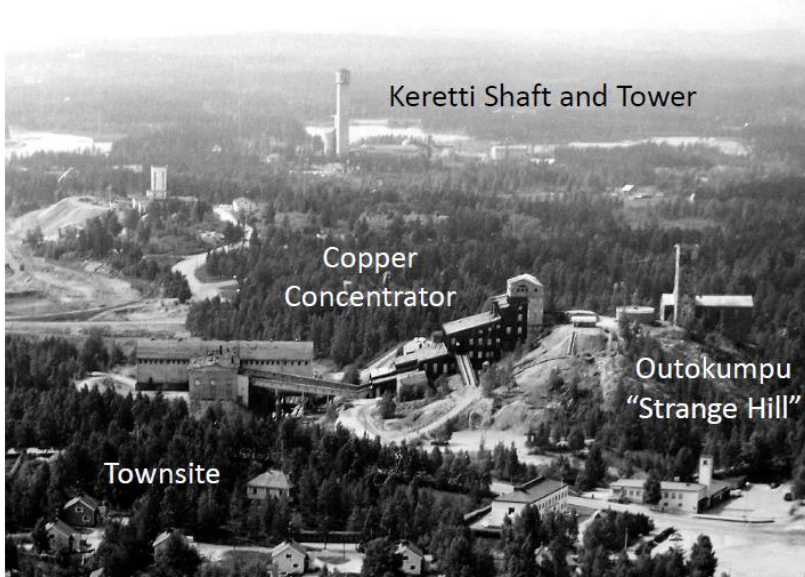


base based on internal company estimates, utilising an EV

- Battery demand has become the single biggest use for cobalt. The limiting factor with cobalt is that it is produced as a by-product of either nickel or copper and there are no significant production hubs outside of the DRC.
- As such, cobalt is vulnerable to supply insecurity. This was seen in 2008 when cobalt prices increased from \$11/lb to 52/lb on the back of country instability.

# Hautalampi – excellent location

- Hautalampi Co-Ni-Cu deposit is located in the renowned Outokumpu Mining cap area, eastern Finland
- The town of Outokumpu has a population of 7,700 and lies 40 km west of the main population center Joensuu (pop 70,000) and 100 km East of Kuopio (pop 90,000)



- Outokumpu is comprised of the closed Keretti and Vuonos copper mines
- During years 1913-1989 a total of 28,5 Mt@ 3,8% Cu was mined from Keretti mine





# Outokumpu town and Hautalampi deposit

## - excellent location for mine development

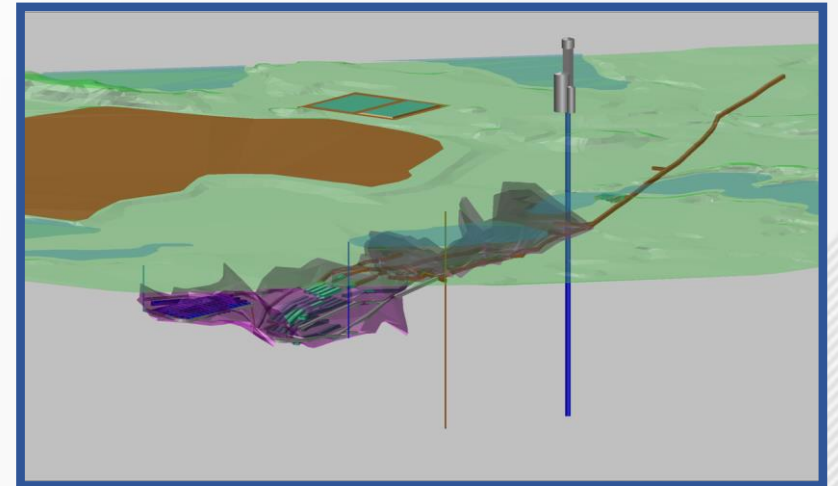


- There is a strong local support for mining activities
- The municipality has evolved from a mining town into a prominent industrial machinery and manufacturing center
- Finland consistently ranks at the top of the Fraser Study of mining jurisdictions



# Hautalampi History, from discovery to development

- Hautalampi Co-Ni-Cu deposit was discovered by early prospecting
  - Located parallel to and vertically 150-200m above the past producing Outokumpu (Keretti) copper mine
  - 1960's drilling produced first resource estimate
  - 1980's metallurgical work revealed Cobalt import
- 
- 1985-1987 significant work:
    - Core drilling 10,000 m
    - The mineralisation was delineated to be 1000m long, up 150m in width and 30 m in thickness
    - Totally 2,1 kms underground development including 1200 meters declined and initial stoping The ore from the development work was blended with the production from Keretti deposit
  - The sudden fall of Ni and Co prices and closure of Kokkola Cobalt roaster put the Hautalampi Mine project on halt in 1986



**FINNCOBALT**



# Further project development

- In 2007 FinnNickel Oy purchased the ground, mining rights and mining lease from Outokumpu Mining Oy
- FinnNickel Oy drilled 92 DDH's, totally 10.1 km during 2007-2008
- Full Feasibility Study was completed 2009:
  - Planned mining rate 350,000 t/a
  - Processing at the nearby Luikonlahti processing plant
- Vulcan Resources Pty Ltd purchased the mineral rights and ground together with the Luikonlahti plant from the FinnNickel bankruptcy estate
- Vulcan Resources Pty Ltd (Perth, Australia) has withdrawn from Finland and sold the Luikonlahti plant and Kylylahti Mine to Boliden AB
- The remaining asset, Hautalampi Mine (via Vulcan Hautalampi Oy), was sold to Alandra Oy and Kiviralli Oy in September 2016. Tetra Ekberg Oy joined the company as the third owner in June 2017
- The deal was “clean” - there are no royalties or redemption rights for the previous owners
- Vulcan Hautalampi Oy owns all mining rights (100%) of the Hautalampi CoNiCu deposit and 280 hectares of the ground (~94% of the mining lease area).
- The Outokumpu Golf course is also owned by VHOy

2009 drilling campaign

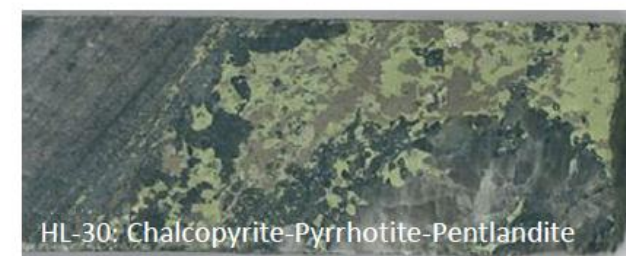
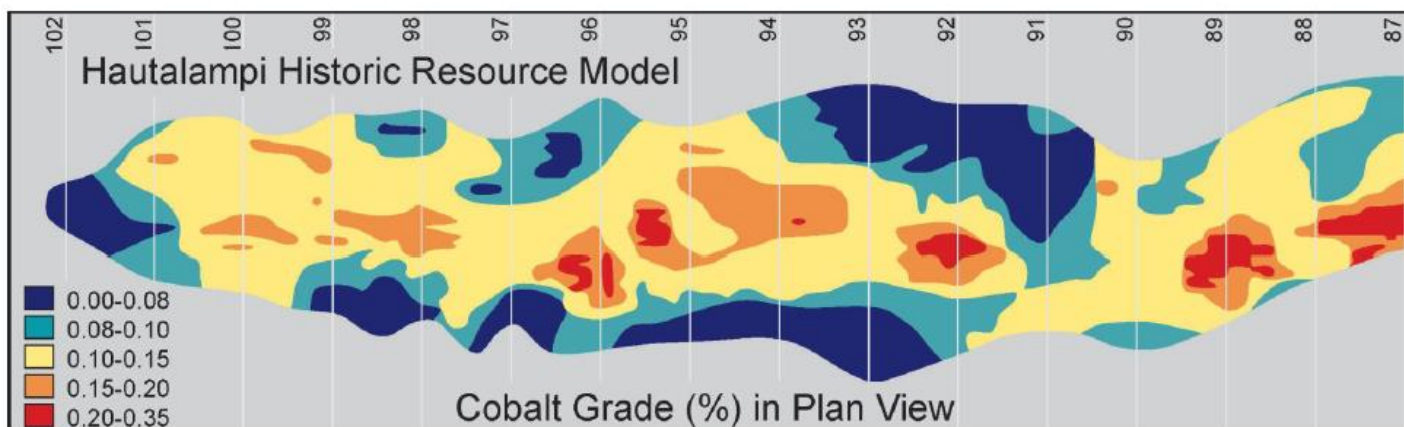
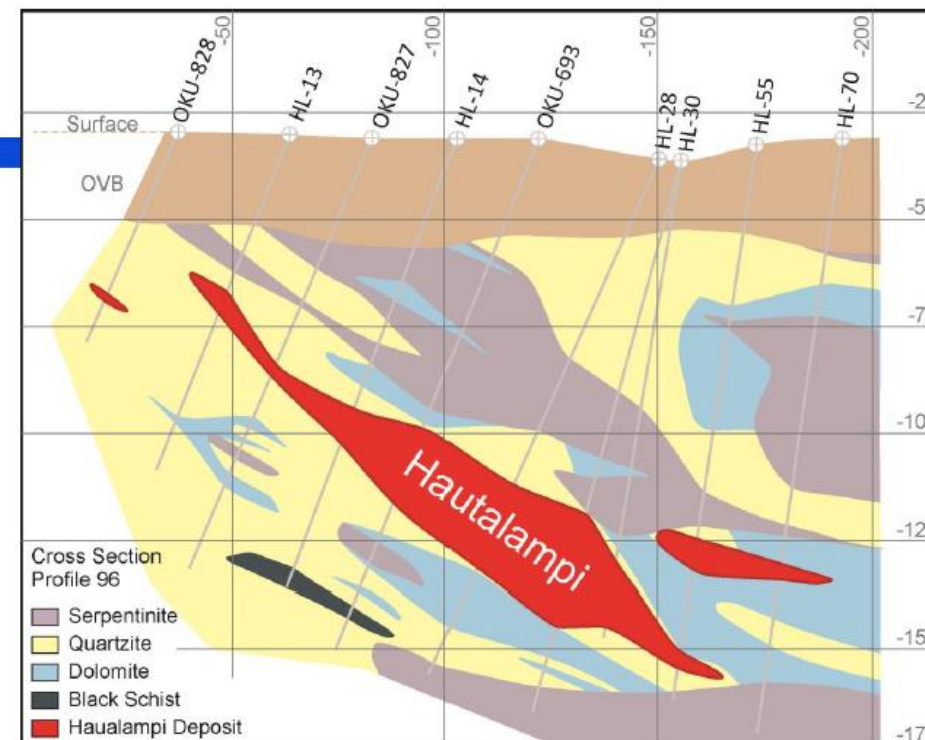


# Hautalampi Deposit

Technical reports centered on the Hautalampi deposit were produced in 2008 and 2009 and utilized as the basis for a Feasibility Study completed in 2009 by FinNickel:

A Mineral Resources Estimate was Prepared:

Mineral Resources	Tonnes	Ni %	Cu %	Co %
Measured	1,030,000	0.47	0.47	0.13
Indicated	1,226,000	0.42	0.30	0.13
<b>Measured &amp; Indicated</b>	<b>2,256,000</b>	<b>0.44</b>	<b>0.38</b>	<b>0.12</b>
Inferred	895,000	0.40	0.30	0.10



verified the work to consider this a current mineral resource.



# Basic facts

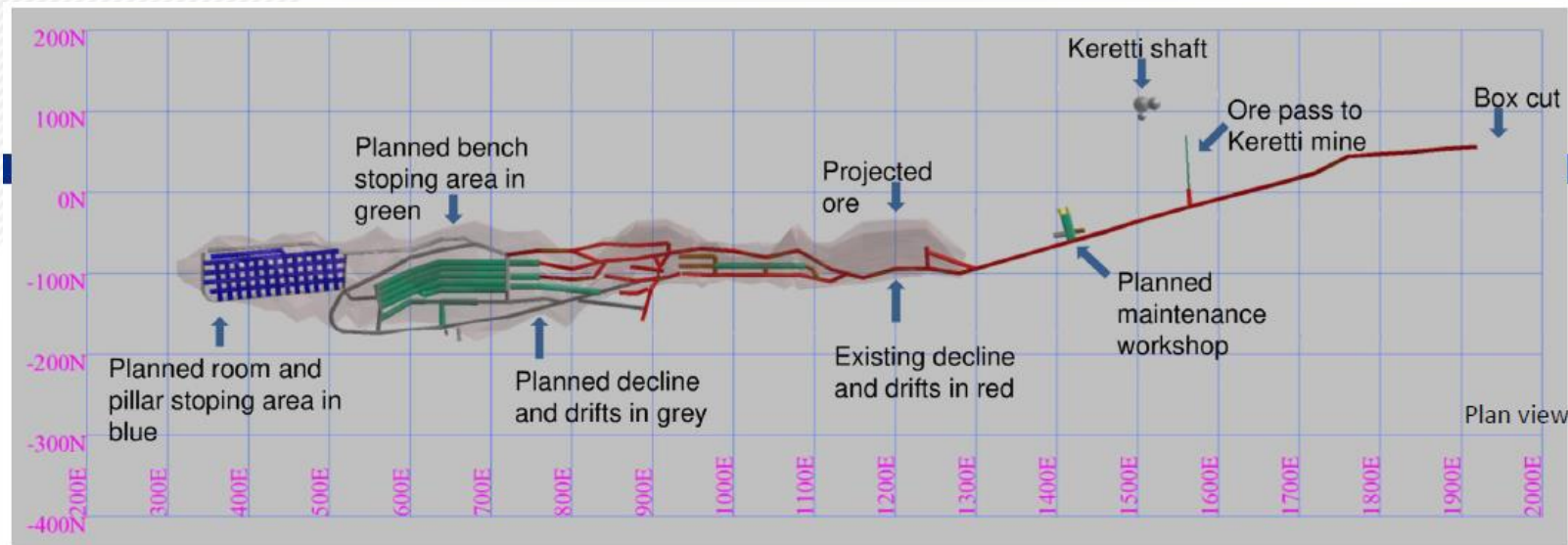
- Main ore minerals:  
Cu : Chalcopyrite  
Ni & Co: Pentlandiitti, linneiitti-polydymiitti

NI-43-101 (historical, year 2008)	Tonnes	Ni%	Co%	Cu%
Measured and Indicated resources	2,256,000	0.44	0.12	0.38
Inferred	895,000	0.40	0.10	0.30
Mining Reserve	2,220,000	0.38	0.10	0.32

- Mine production 350 000 tpa @ Ni 0.38%, Co 0.10%, Cu 0.32%
- Metals production: Ni 1 100 tpa, Co 300 tpa, Cu 930 tpa
- Assumed 10 year production
- Potential for much longer lifetime with additional resources and reserves
- 150 employees

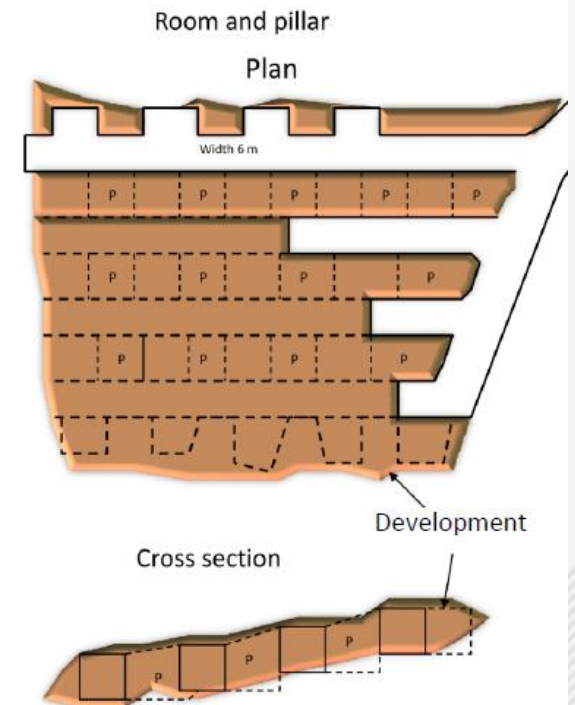
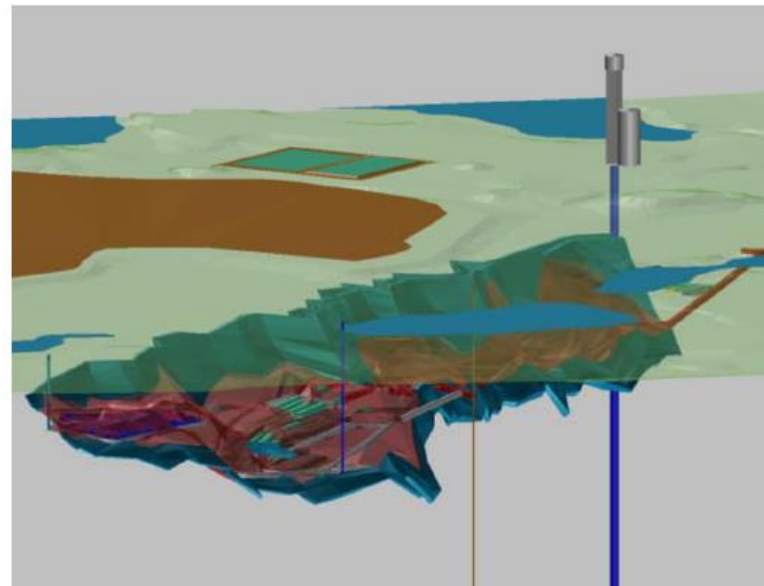
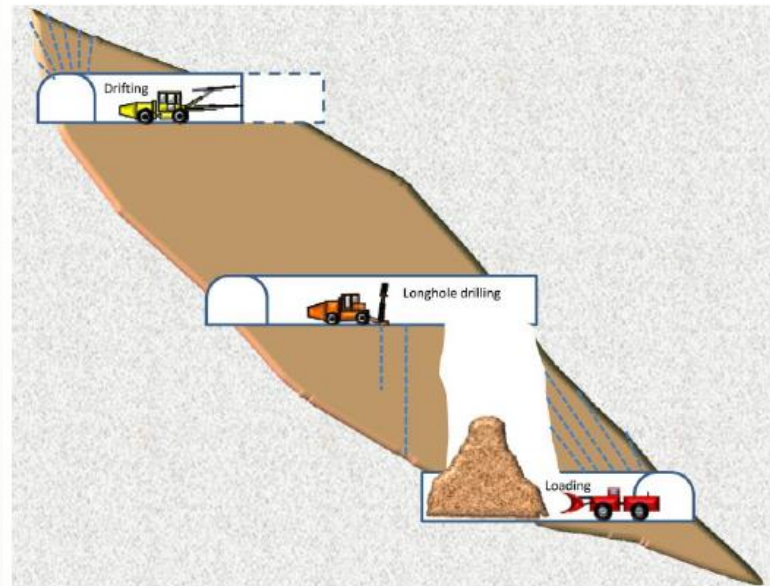






## Potential Development

The plan proposed in the FinNickel 2009 feasibility is a combination of Long-hole Stopping and Room & Pillar

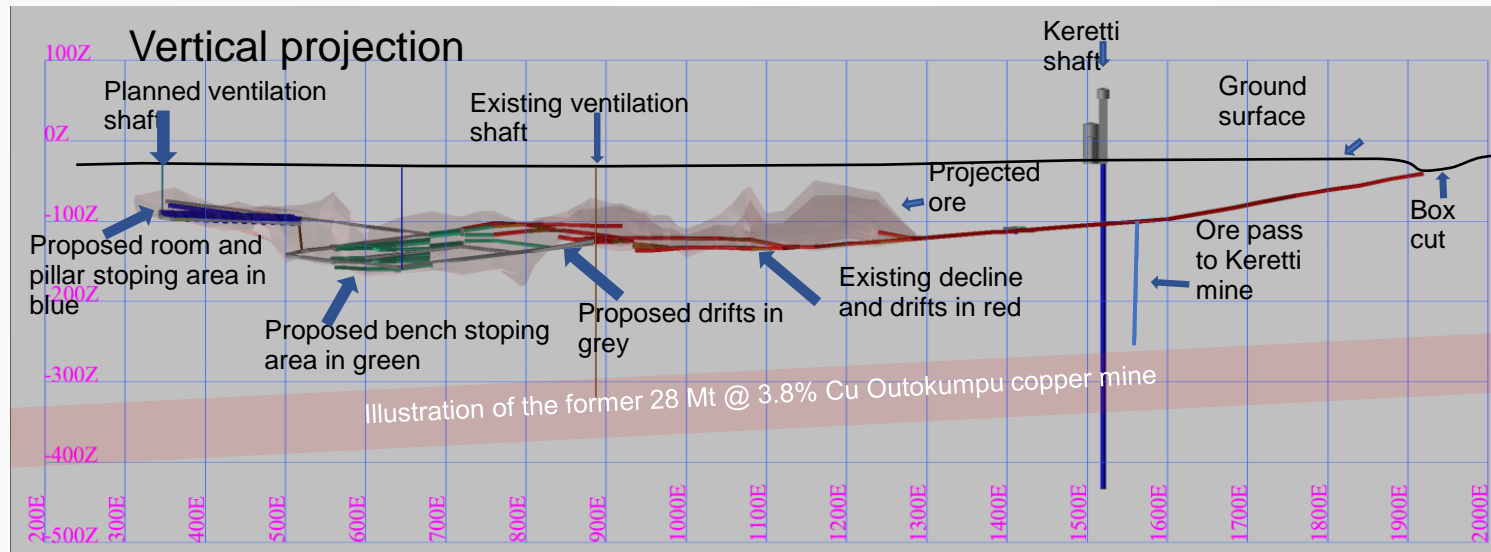
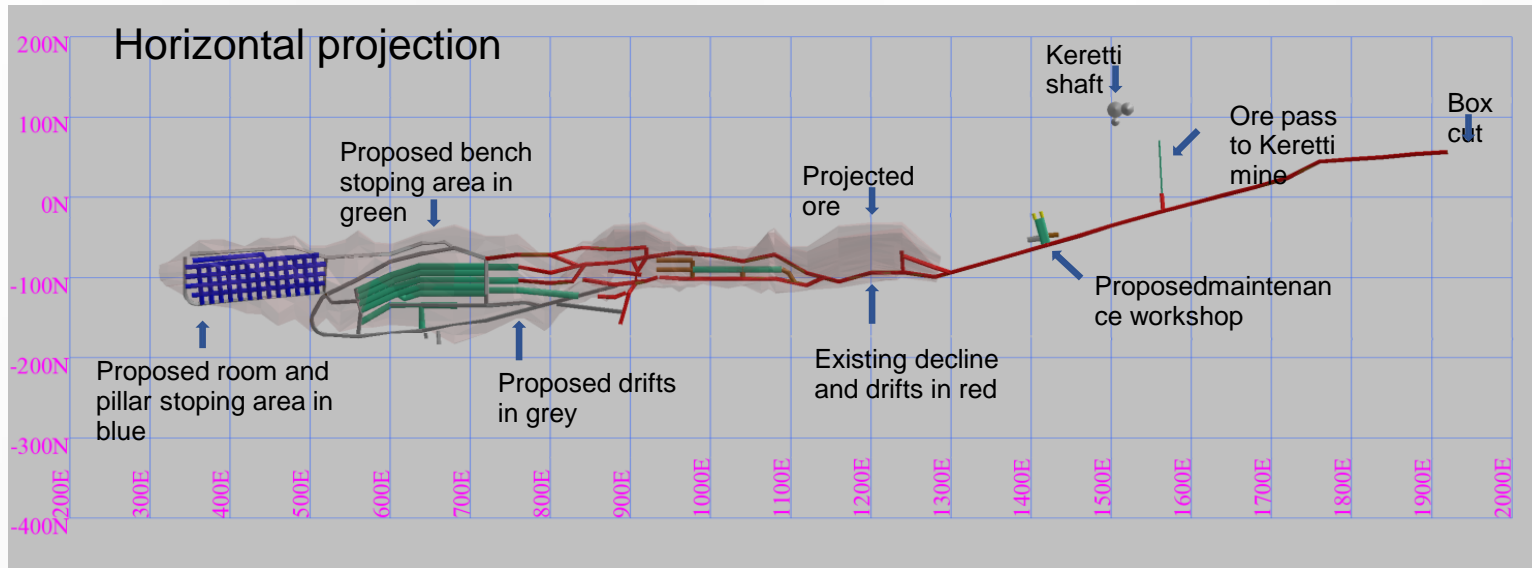


*A Qualified Person for Explorex has not sufficiently reviewed or verified the work to consider this more than conceptual. Economic viability has not been demonstrated.*

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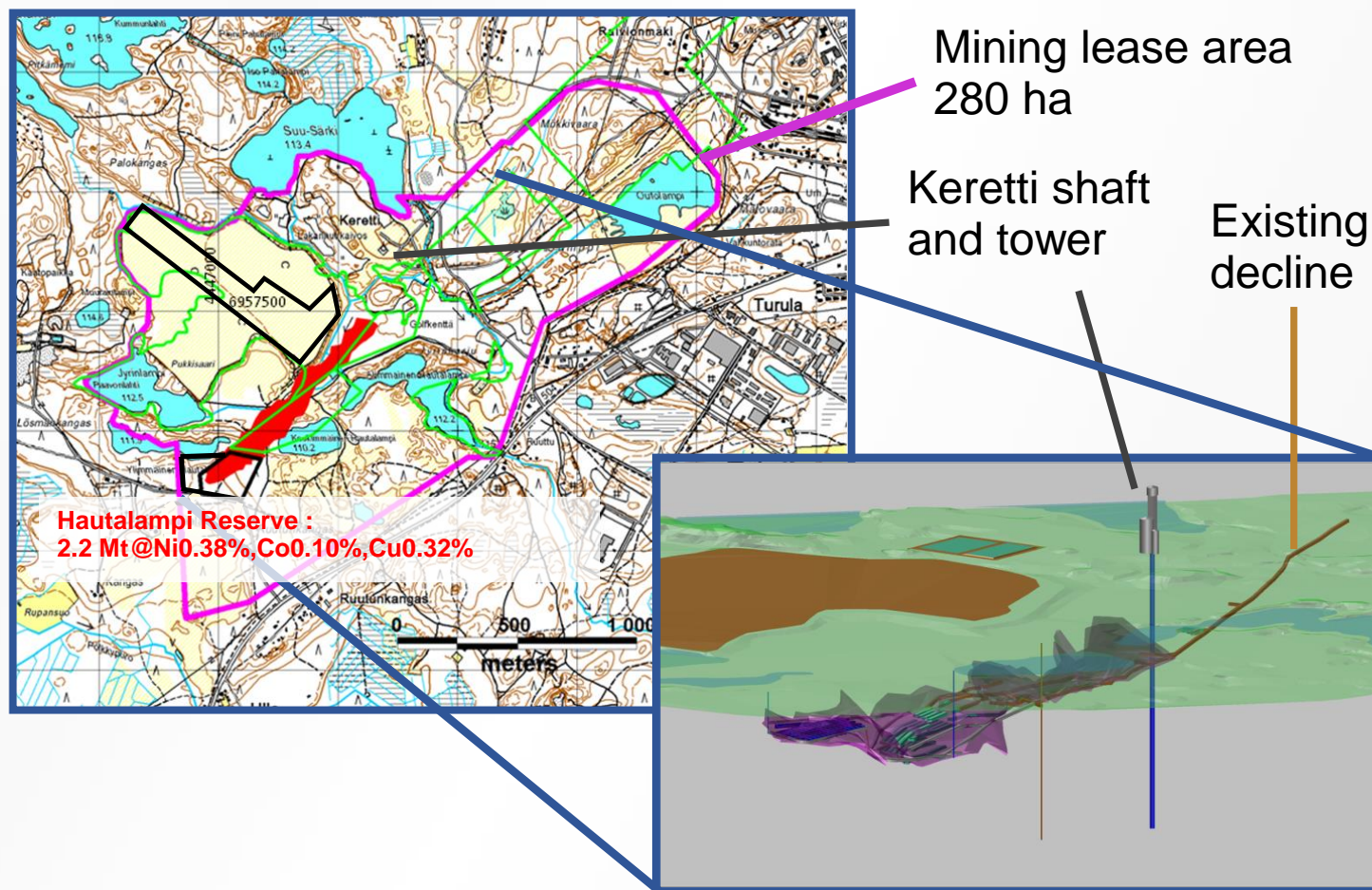
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# Hautalampi Mine area

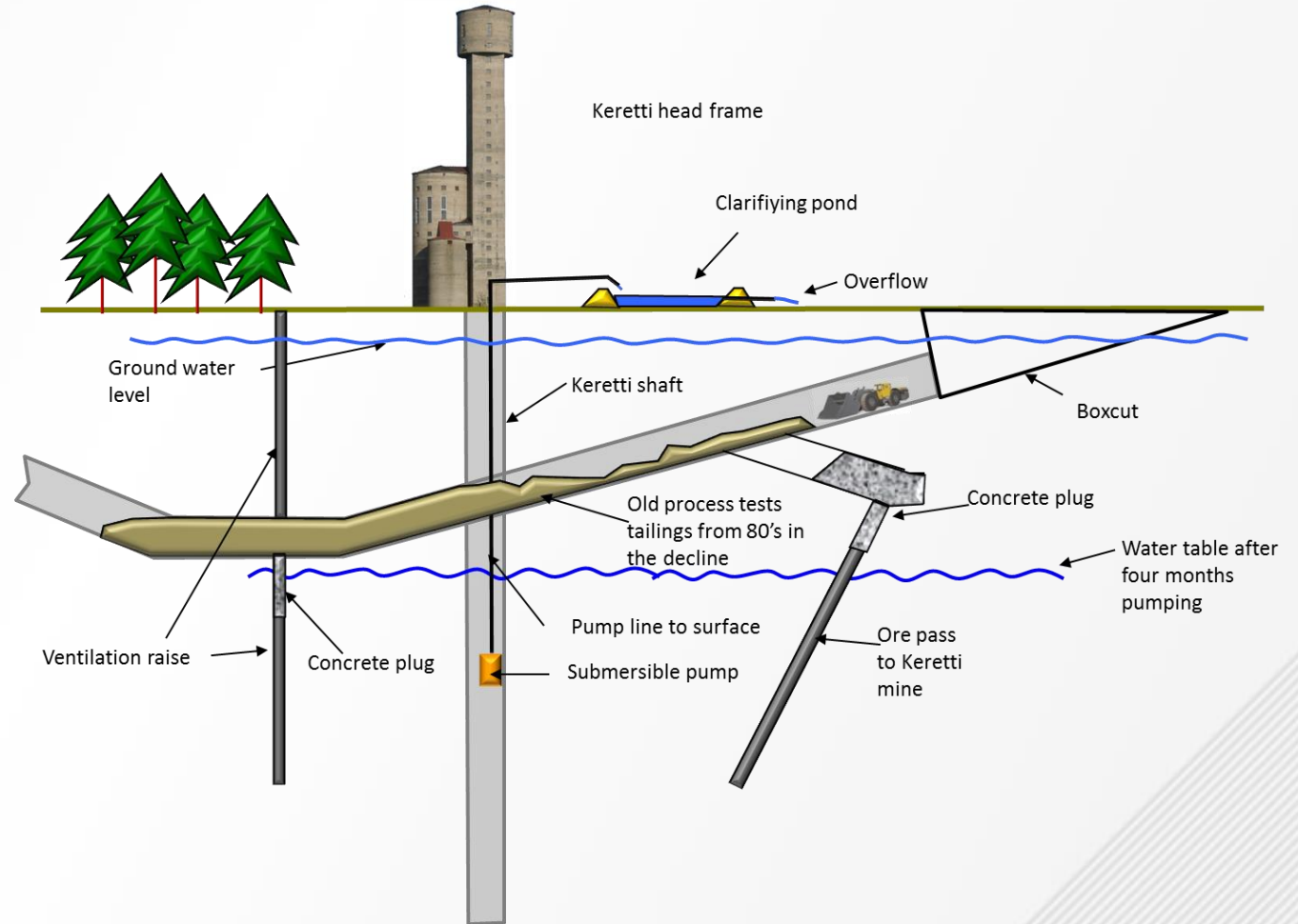




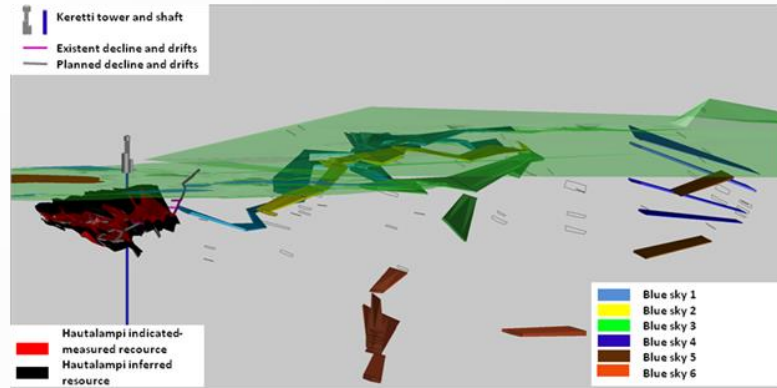
# Permits and Mining Concession

- Environmental and Water discharge permit for the underground mine granted
- The permit is valid and in force and will allow mining operations to commence immediately
- Mining Concession Granted 2013, total area 284 hectares
- Hautalampi Mine opening works are estimated to take about 12 months
- Preparation of an environmental permit application for a stand-alone processing plant at the former Keretti mine site has commenced

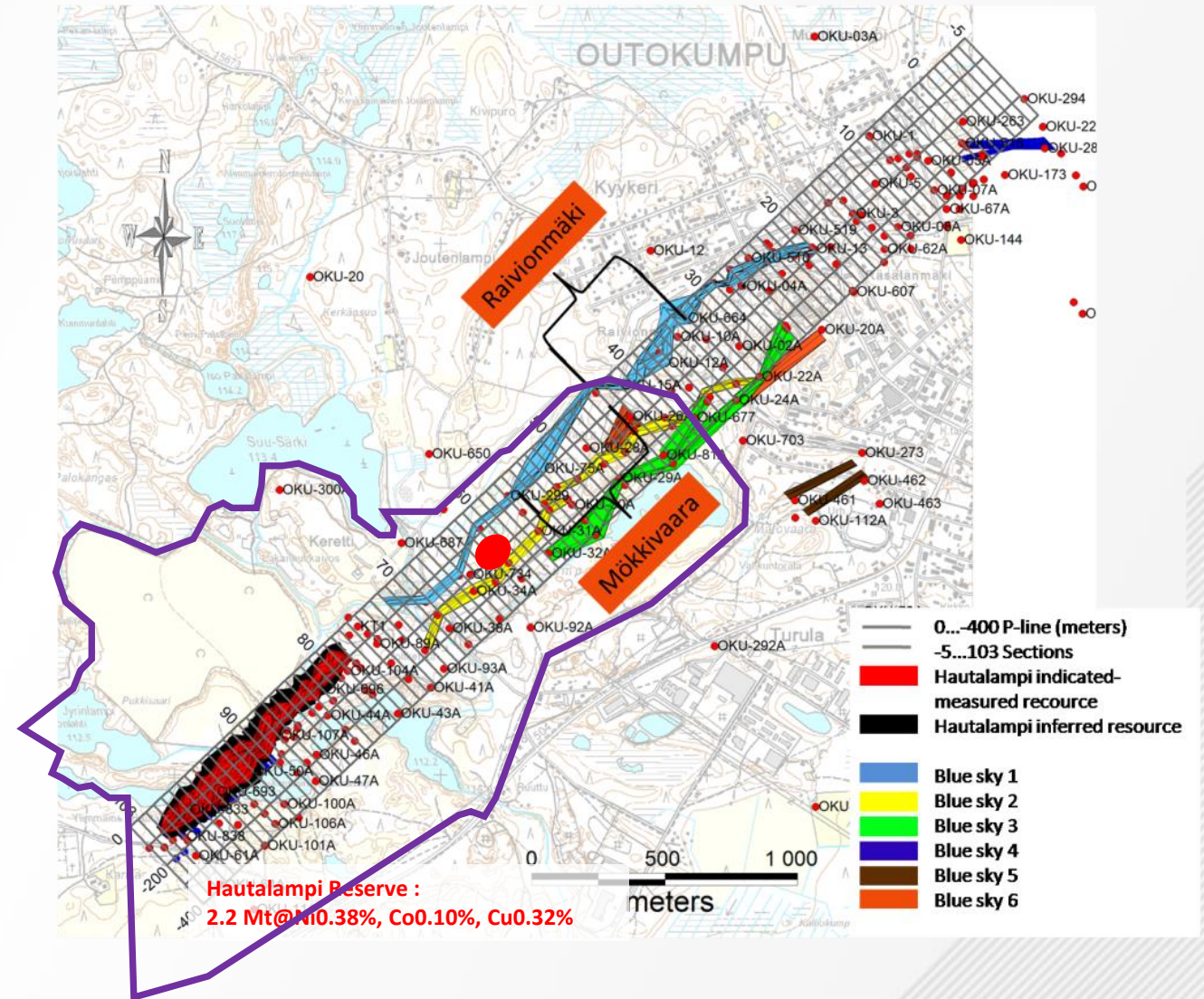
PRINCIPLE OF DEWATERING AND MUD REMOVAL OF DECLINE



# Hautalampi – exploration potential



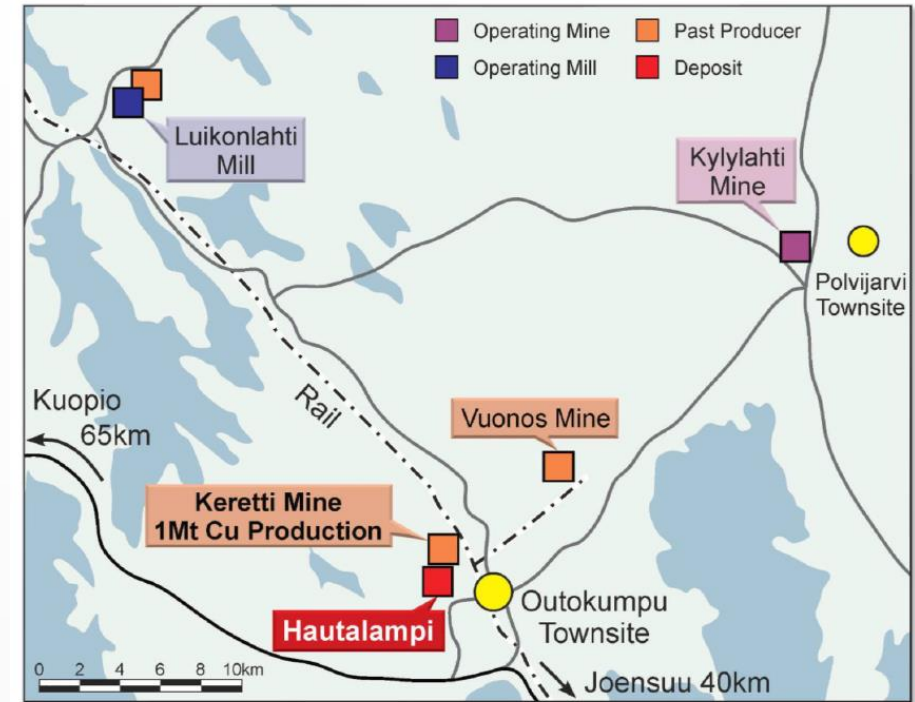
- There is a significant exploration potential in the mining lease area
- Verified by relogging and reassaying of historical core logs
- Additional drilling required
- The geological setting and mineralization type is similar to the Hautalampi deposit





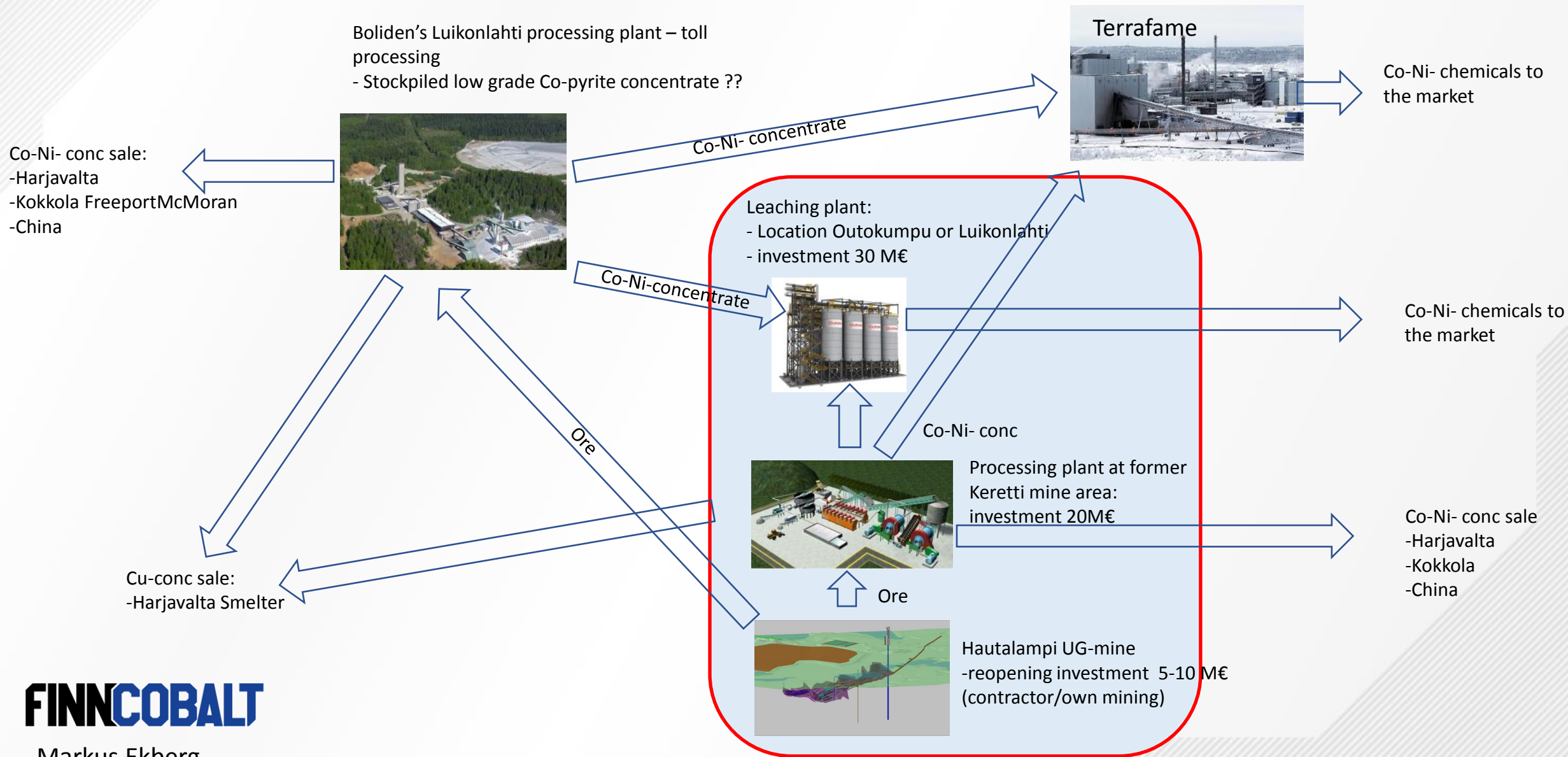
# Processing options

- FinnCobalt does not have its own processing facilities
- Alternatives for ore processing are:
  - **New processing plant** next to the Hautalampi Mine. Existing mine site and tailings area can be used and tailings can be used as the paste back fill in the underground mine. Key equipment purchased
  - **Boliden** Kylylahti Copper Oy: **Luikonlahti Mill**; Negotiations initiated. Options are toll processing or purchase of the plant. Trucking distance 45 km. Enough capacity, ore reserves will exhaust year 2020
  - **Mondo** Minerals Finland Branch: **Vuonos Mill**; Talc-Nickel concentration plant and leaching of the by-product nickel concentrate. Trucking distance 8 km





# Possible Ni-Co material flows and production options in Finland



**FINNCOBALT**

Markus Ekberg

# Preparing for production... long lead time equipment purchased

- Three stage crushing plant - second hand:
  - Jaw Crusher 1500mm + feeder
  - Cone & gyratory crusher
  - Overhead crane, feeders, rock breaker etc
- Second hand grinding mills from Hitura mine:
  - Rod mill dia3.2 x 4.5m with motor 500kW, including gearbox + lubrication + electric equipment + steel liners included
  - Ball mill dia3.2 x 4.5m with motor 750kW, including gearbox + lubrication + electric equipment
  - Ball mill dia3.2x 4.5m with motor 500kW, including gearbox + lubrication + electric equipment
- Total replacement value min 6M€



# Milestones

- 2016 acquisition and organize all material ✓
- Investor presentations and web sites ✓
- 2017 drilling for metallurgical samples 1200 meters – completed ✓
- 2017 First financing
  - €1 M secured for the metallurgy program – TEKES loan + own equity ✓
  - Target additional €2-3 M for the resource upgrade drilling – **open**
- 2018 metallurgical test work for alternative processing options – chemicals production – **flotation test work completed, leaching to commence** ✓
- Processing plant environmental permit application - **commenced**
- 2019 Feasibility study update - OPEX/CAPEX
- 2020 Offtake agreements of concentrates/chemicals
- 2020 Financing for Mine Opening and possible partnerships
- 2021 Mine Opening Investment (€5 -> 60 M; own mining/contractor, toll processing or own plant, +/- chemical plant )
- 2022 Mine and concentrate/chemicals production start-up –earliest





# The board and management



- **Vesa-Jussi Penttilä (b. 1947), CEO**
  - **Founder and CEO since 2016.** MSc (Geology) Helsinki University 1975
    - **Principal Work Experience:** 45 years experience in the mining industry in Finland and Africa including General Manager positions at the Hitura Nickel Mine and Outokumpu Exploration. Nordic Exploration Award 2007.
    - **Holdings in company:** 33.3% via Alandra Oy
- 



- **Markus Ekberg (b. 1957), co-owner since June 2017**
    - **Previous positions include:** CEO of Endomines AB (listed NASDAQ OMX), Founder and ex-board member in Kodal Minerals PLC (AIM); board member and chairman in Finnish Mining Association; CEO and chairman of Tetra Minerals Oy; CEO and owner of Karelian Resource Service Oy
    - **Principal work experience:** 35 years experience in the international mining industry (gold, base metals, chrome, industrial minerals) in Finland, Norway, Ireland and Australia.
    - **M.Sc (Geology and Mineralogy), Turku University, Finland 1985.** Qualified Person (Australian JORC and Canadian NI-43-101 stock exchange codes), Eurogeologist, Kvalificerad Person (Svemin/FinnMin)
    - **Holdings in company:** 33.3% via Tetra Ekberg Oy
- 

- **Jarkko Ralli (b. 1941), Chairman of the Board since 2016**
  - 50 years mining contracting experience via own contracting companies Kiviralli Oy and Jarkko Ralli Oy in several Finnish mining operations
  - **Holdings in company:** 33.3% via KiviralliOy

# Why FinnCobalt ?

- Excellent opportunity to participate in the cobalt price increase
- **Development ready battery minerals project:**
  - **Environmental permit** for mining and mining lease valid and in force
  - Ground (90%) and **mining rights (100%) owned** by the company
  - Canadian standard NI43-101 - resource (and reserve) defined
  - Previous mining camp with excellent infrastructure and workforce availability
  - Value-add from **producing nickel and cobalt battery chemicals**
  - Long lead time equipment purchased
- **Upside potential** from the increased resource/reserve basis and alternative processing options
- **Experienced and committed local owner and management team**
- **Safe jurisdiction** for all operations – Finland top scorer in the Fraser Mining study

**=> Small, quick and easy - with an upside potential!**

# Why Finland?

1. Raw Materials and existing downstream processing facilities
2. Access to Co-Investment and management support
3. Advanced Research and Development climate
4. High Education level
5. Reasonable priced and reliable energy
6. Efficient permitting and competitive taxation



**FINNCOBALT**