Governments, Mining Companies Executives and Shareholders Allow to Leave Behind and Never to be Recovered Capitally Accessed and Broken High-Grade Ore Underground Worth Billions of Dollars - Why????

MINEX Europe 2020

July 2020

By Krzysztof (Kris) Biegaj
Ausvac Mining Pty Ltd
Australia
Mining Project Stages

- Exploration
- Pre-feasibility study
- Feasibility study
- Approved
- Access development and mine waste disposal
- Mining
  - Various reconciliation/camouflaging factors used
  - Cleaning of mine floors not yet part of mining cycle in Australia and most of other Countries in the World
    - Exact % of gold/metals/precious stones lost/left on mine floors not yet determined
- Rehabilitation of disposed mining waste on surface
Post “normal” mining activities

- Pillars recovery
  - Expertise still available in Australia and other Countries
  - Artificial pillars
    - Cement grout packs
    - Gypsum packs
    - Steel props
    - Other
  - Diamond wire saw
    - Jack pots
Post “normal” mining activities - continued

- Stope wash-down
  - Can argue re amount gold lost in stopes’ floor cracks
    - South Africa
  - Stope supersucking/vamping
- Ore drives supersucking/vamping
  - Last cycle !!!!!!
- Sampling of recovered floor material
Floor sampling at CNGC Harlequin Mine in Western Australia (April 2001)

- Conducted by Kris Biegaj in 3.5m x 3.5m HV5F -41mRL in-stope single boom jumbo decline
- Mined through semi-horizontal quartz reef ~300mm thick containing 100-300g/t of nuggetty-type Au
- Five (5) separate layers taken across the 3.5m wide decline
  - With additional samples, nine (9) separate samples analysed
- Last layer taken with a small dust-buster vacuum cleaner
  - To the solid clean floor
  - Small weight of those samples
- Total weight of samples - 132kg
  - Unfortunately photos taken did not come out
From: Briggs, Matthew  
Sent: Tuesday, April 03, 2001 2:36 PM  
To: Biegaj, Kris  
Subject: Channel sample from 41dec.xls

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<th>Sample</th>
<th>Au1 (ppm)</th>
<th>Au2 (ppm)</th>
<th>av gold (ppm)</th>
<th>sample mass (kg)</th>
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Weighted average grade: 40.02 g/t
Construction/features

▪ First truly mobile Supersucker in Australia - possibly in the World – designed and built in Kalgoorlie, Western Australia
▪ Initially designed to carry-out underground exploration winzing
▪ Idea originated and first units built on opal fields in Coober Pedy in South Australia in the late 60-ties of previous Century
▪ Size: 2.2mW, 2.95mH and 5.3mL (excluding 3.5m clean-down jib)
▪ Track mounted, diesel-powered self-propelled unit
  ▪ Easily detachable heavy-duty wheels for longer distance towing
  ▪ Powered by diesel engine
  ▪ Can be easily converted to be electrically powered
▪ Installed devices to eliminate potential dust problems
▪ ROPS/FOPS features installed
▪ Works in conjunction with a bobcat/skid steer or small LHD
▪ Remotely-controlled capabilities can be installed
Re-fuelling underground

- At the start of shift
- Diesel hand-pumped to jerry cans from a 180ltr tank located on the utility vehicle – see photo
- Hand-pumped into supersucker with 220ltr tanks capacity
Projects to date by Ausvac Mining Pty Ltd

- May 2003 – Mt Pleasant Gold Project, WA – **First Job**
  - Ore drives clean-down **Plus cleaning of sump on surface**
- Aug 2003 – Otter-Juan Nickel Mine, Kambalda, WA
  - 15 deg. air-leg stope and ore drives clean-down
- Oct 2003 – Bendigo Gold Project, Victoria
  - Ore drives clean-down
- Dec 2003 – Cosmos Nickel Project, WA
  - Ore drives clean-down
- Feb 2004 – Agnew Gold Project, WA
  - Ore drives clean down
- Oct 2005 – Long-Victor Nickel Complex, WA
  - Stopes and ore drives clean-down at Gibb South
- Feb 2007 – Redross Nickel Mine, WA
  - Ore drives clean-down
- Nov 2010- Jan 2011 – Norseman Gold NL, WA
  - Stopes and ore drives clean-down at Harlequin Mine
Underground Mobile Supersucker

- **Excavation size requirements**
  - 3.2mW x 3.5mH drive
    - Designed to fit small 2 - 3 yard LHD size ore drives
- **Ventilation required**
  - Secondary: ~ 10 m³/s (S/sucker 7.0m³/s + bobcat 3.0m³/s)
    - For 140 kW diesel engine
    - ~60kW bobcat
      - Based on 0.05m³/kW - maximum diesel engine rating as per Western Australian (WA) Mines Regulations
- **Fresh** water supply required – due to high salinity of mine water in most u/g mines in WA
Capabilities/parameters

- Suction hose diameter - 200mm (8 inch)
  - Can be easily upgraded to 250mm (10 inch) hose
    - Fundamental for vacuuming bigger size rocks/increasing productivity
    - Oversize ore picked up/loaded into/by bobcat bucket at the end of vacuuming cycle
- Vertical lifting/suction - up to 50m
- Horizontal lifting - up to 50m +
Productivities in an ore drive

- 15 - 20 t/10hr shift with one (1) operator
- 40 t/10hr shift with two (2) operators
- 80 t/day with two (2) operators/shift - two (2) shifts/day
  - >2,000 t/month (assuming only 85% availability of equipment and working places)

Ore that is “normally” wasted

- Highly successful floor material recovery on a nickel mine in a 15 degrees flat-dipping air-leg/hand-held mining stope conducted in 2003
### Extra Revenue from Gold or Nickel left behind and recovered from mine floor with vacuuming

#### Nickel

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<td>Total $/t</td>
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<td>Width</td>
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<td>Grade %</td>
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<td>Total ore tonnes</td>
<td>1,311.9</td>
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#### Gold

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*Note: *Mine A is Vacuumed When Future Nickel Prices are likely to exceed approximately US $8/lb.
Why do Governments continue to Allow Mining Companies to Leave Behind Never to be Recovered High-grade Capitally Accessed and Broken Ore Underground i.e. Wasting Billions of Dollars including Additional Pollution to Environment ????
Underground Mobile Supersucker

Other applications

▪ Surface/mill/underground fast sumps/tanks clean-down
▪ Underground winzing – *originally designed for that application*
  ▪ Old Timers knew what they were doing
    ▪ Examples in Australia and in the World
▪ Mining of bottom sections of ore shoots not warranting capital development or pit stripping/cut-back
▪ Environmentally friendly, alternative mine access and ore hoisting system
  ▪ “Modified” Western Australian Norseman access and hoisting to high-grade low tonnage orebodies (*Regent/Crown/North Royal inclined shafts*)
    ▪ *No decline access in waste required i.e. less pollution to environment*
▪ Surface construction excavations and cleaning industry
  ▪ Swimming pools included