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Short-term geological modelling for improved mine planning at Isibonelo Colliery

Katuruza, Meaker

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Improving the short term model and other opportunities from drone data at Isibonelo Colliery, South Africa

Geoscience Innovation Colloquium, Johannesburg, 2018

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AngloAmerican

1. MINE OVERVIEW

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3. DRONE FLYOVER

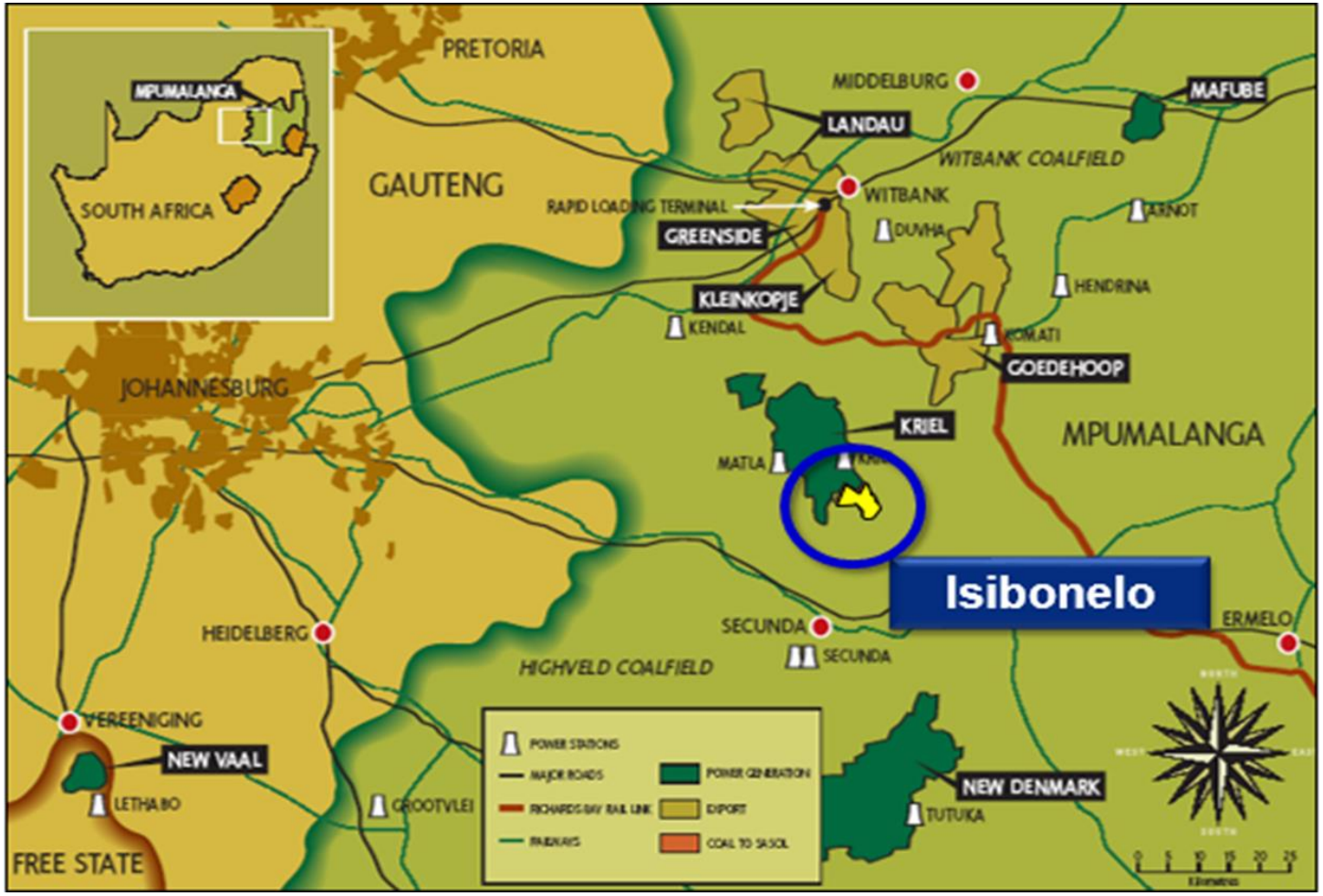
4. SHORT TERM MODELLING

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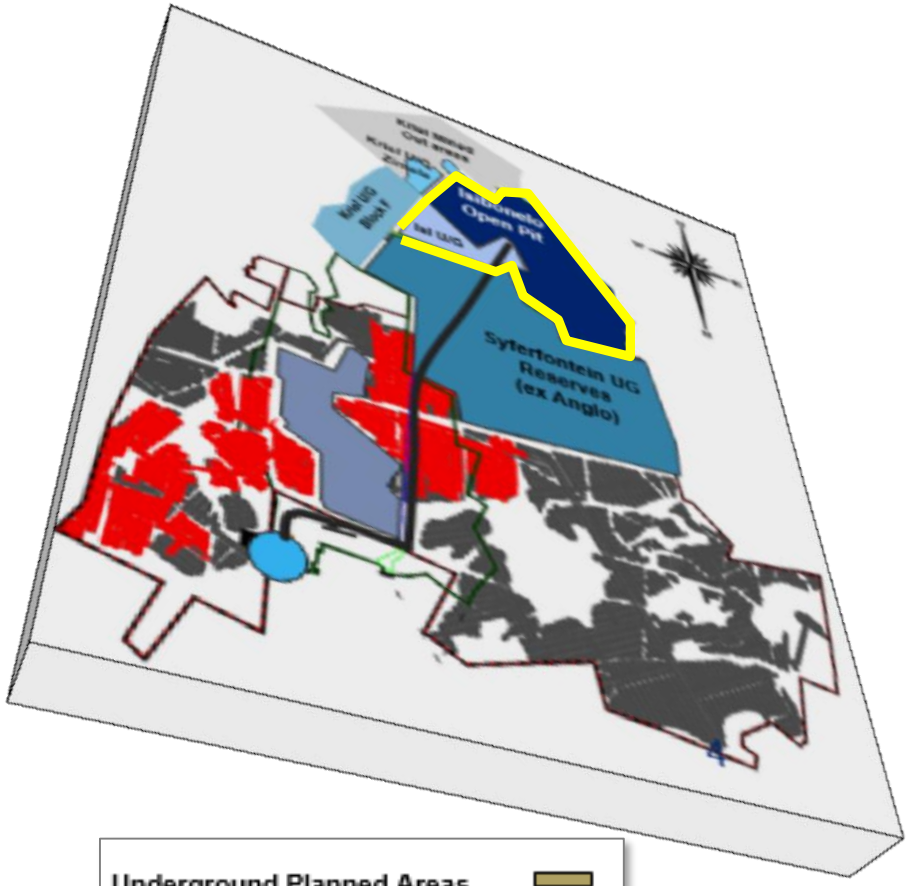
7. ACKNOWLEDGEMENTS

MINE OVERVIEW

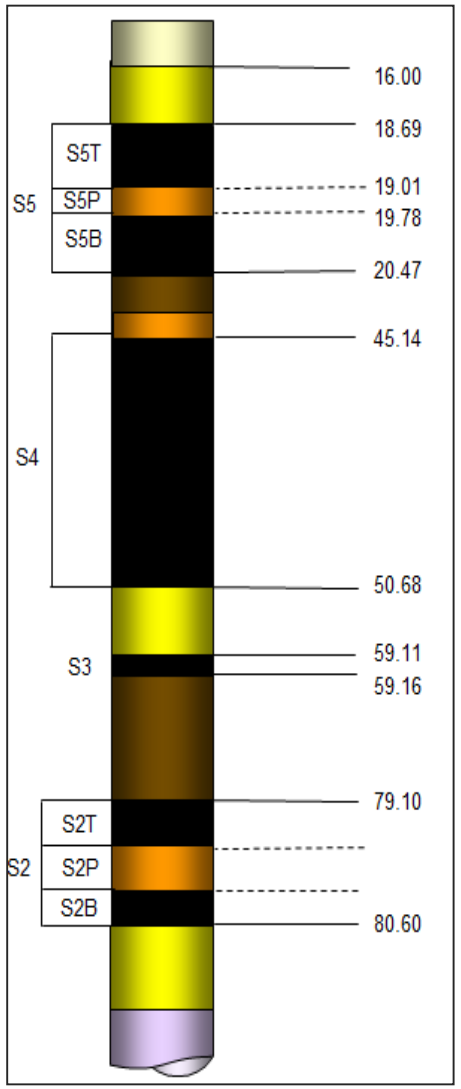


- Syferfontein Open Pit mine operated 1991 to 2003
- Coal Supply Agreement signed in 2003
  - Reserves for market swap agreement
  - Dedicated supply to the Synfuels plant
- Isibonelo acquired the ex-Syferfontein infrastructure
  - Pit is 16km from the workshop & Office area
  - Coal conveyed 14 km to point of sale
  - Further 22km to Synfuels plant
- Mine opened in 2005
- Current Life of Mine is 2026
- Opencast strip -mining method employed

MINE OVERVIEW



Underground Planned Areas
Underground Mined out Areas
Underground Planned Areas
Open Cut Mined out Areas
Open Cut Current Mining Areas



5 Seam

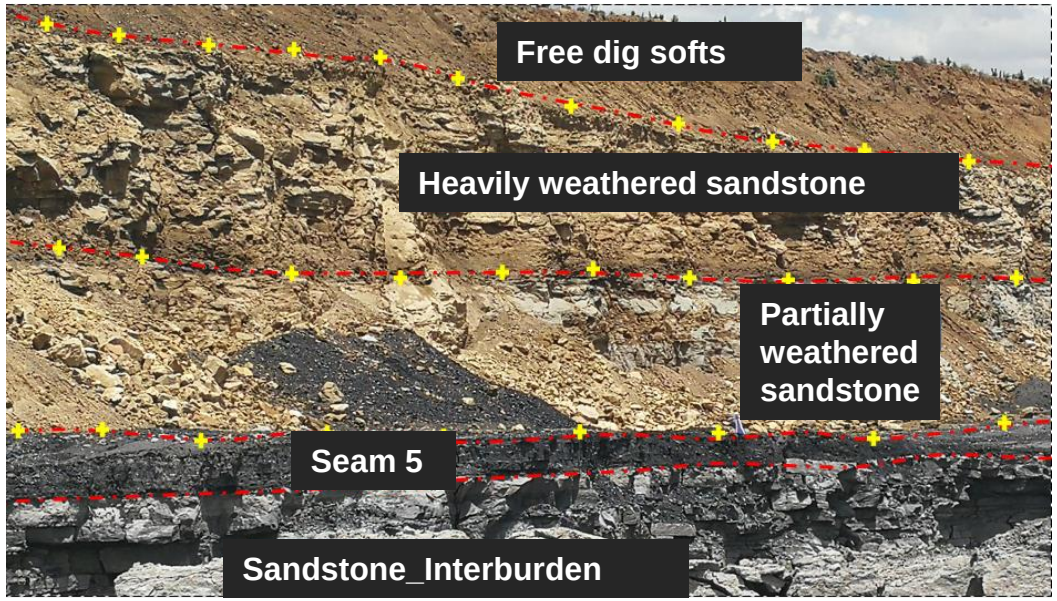


4 Seam



CURRENT HIGHWALL MAPPING PROCESS

- Geologist and Surveyor team
- Survey Total Station
- Time consuming
- Ensure safe distance from HW
- Potential mapping errors
- No revisit of georeferenced system





DRONE FLYOVER

- Unmanned Aerial Vehicle (Drone)
- 23 February 2018
- Cloudy conditions
- Cleaning of data
- Drone model capture a moment in time



Phantom 4



VidBlast

Vidblast (PTY) Ltd
Reg Nr: 2014/209711/07
Tel: 076 154 2407
Email: vidblastwtb@gmail.com

CloudCompare V2

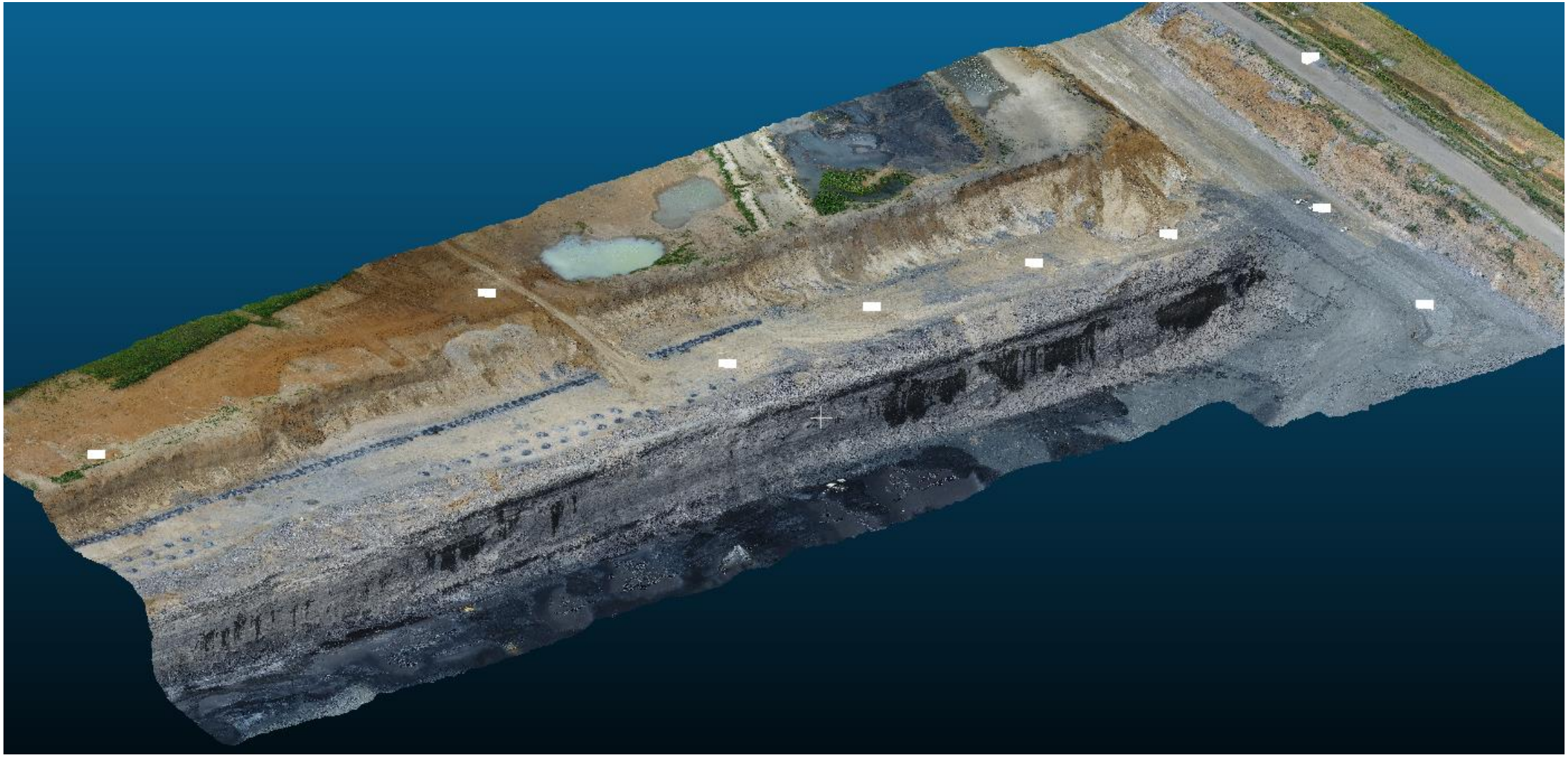
Agisoft

DRONE FLYOVER

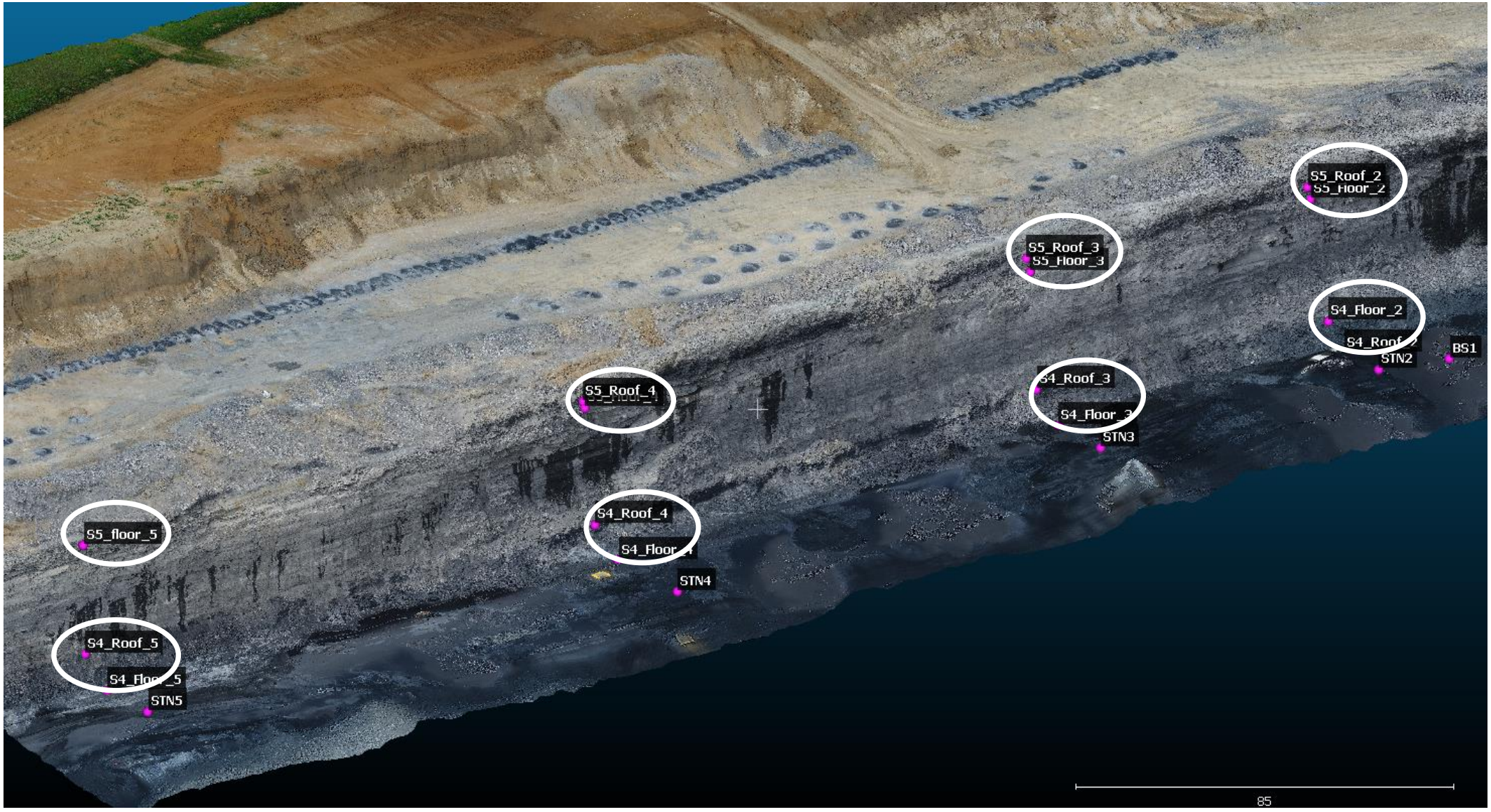


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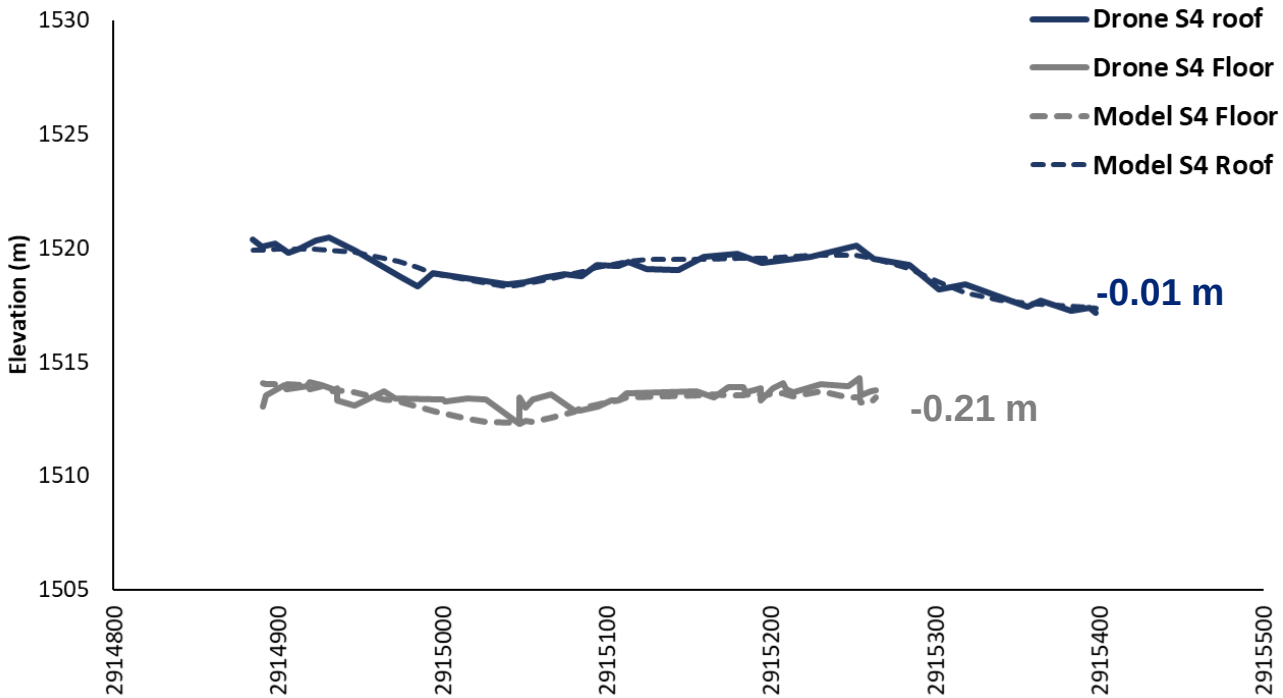
- 9 Control points used in South Pit

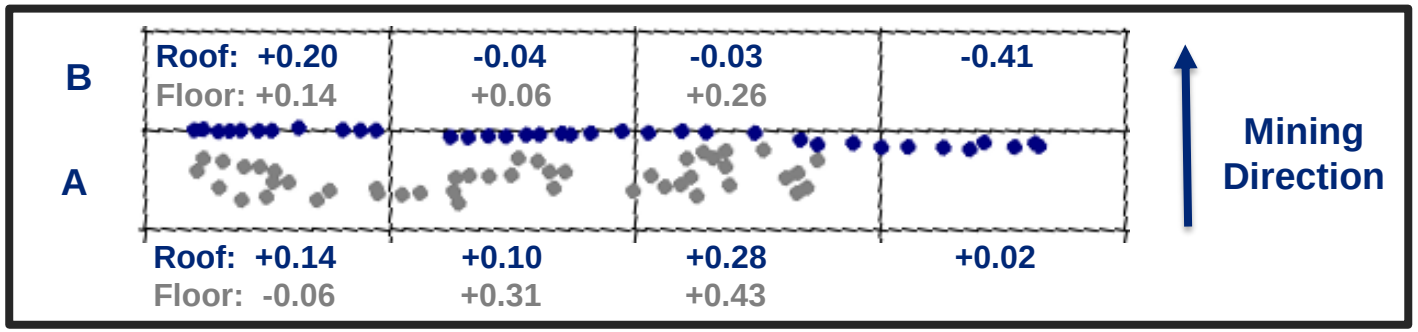


DRONE FLYOVER

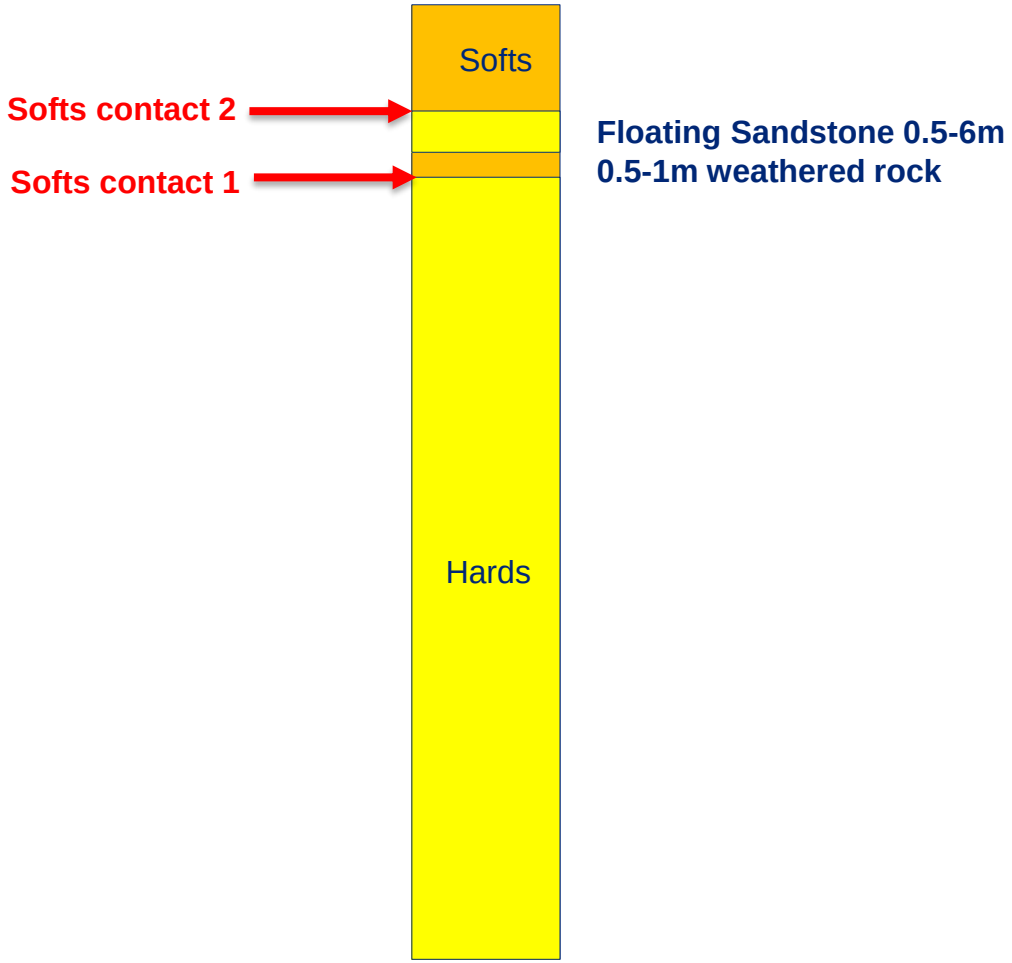


SHORT TERM MODELLING





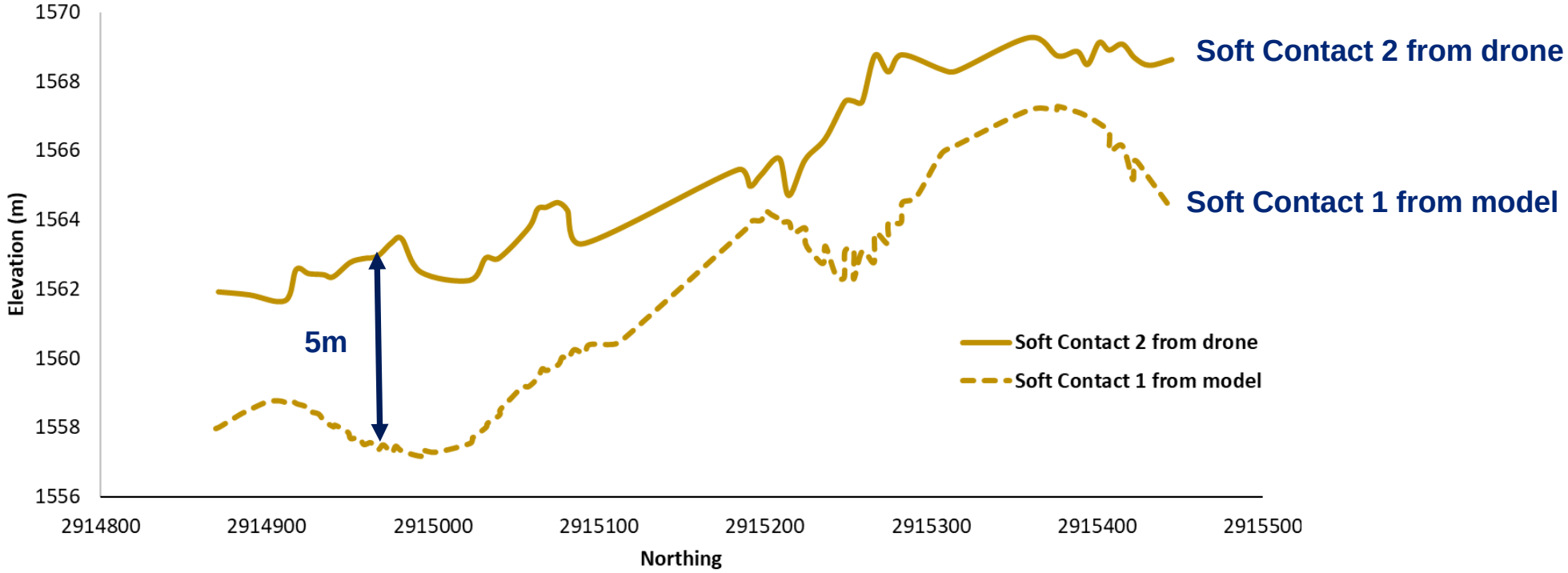
SHORT TERM MODELLING



SHORT TERM MODELLING

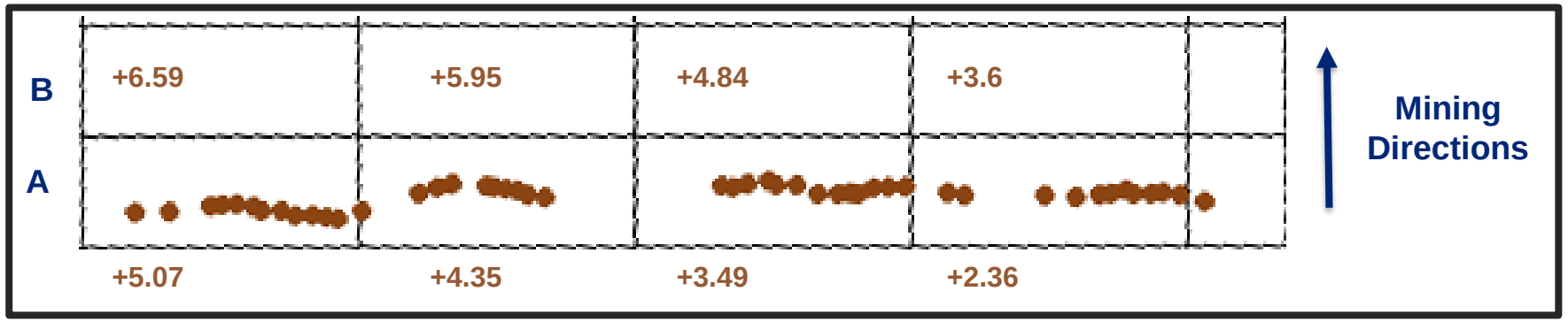


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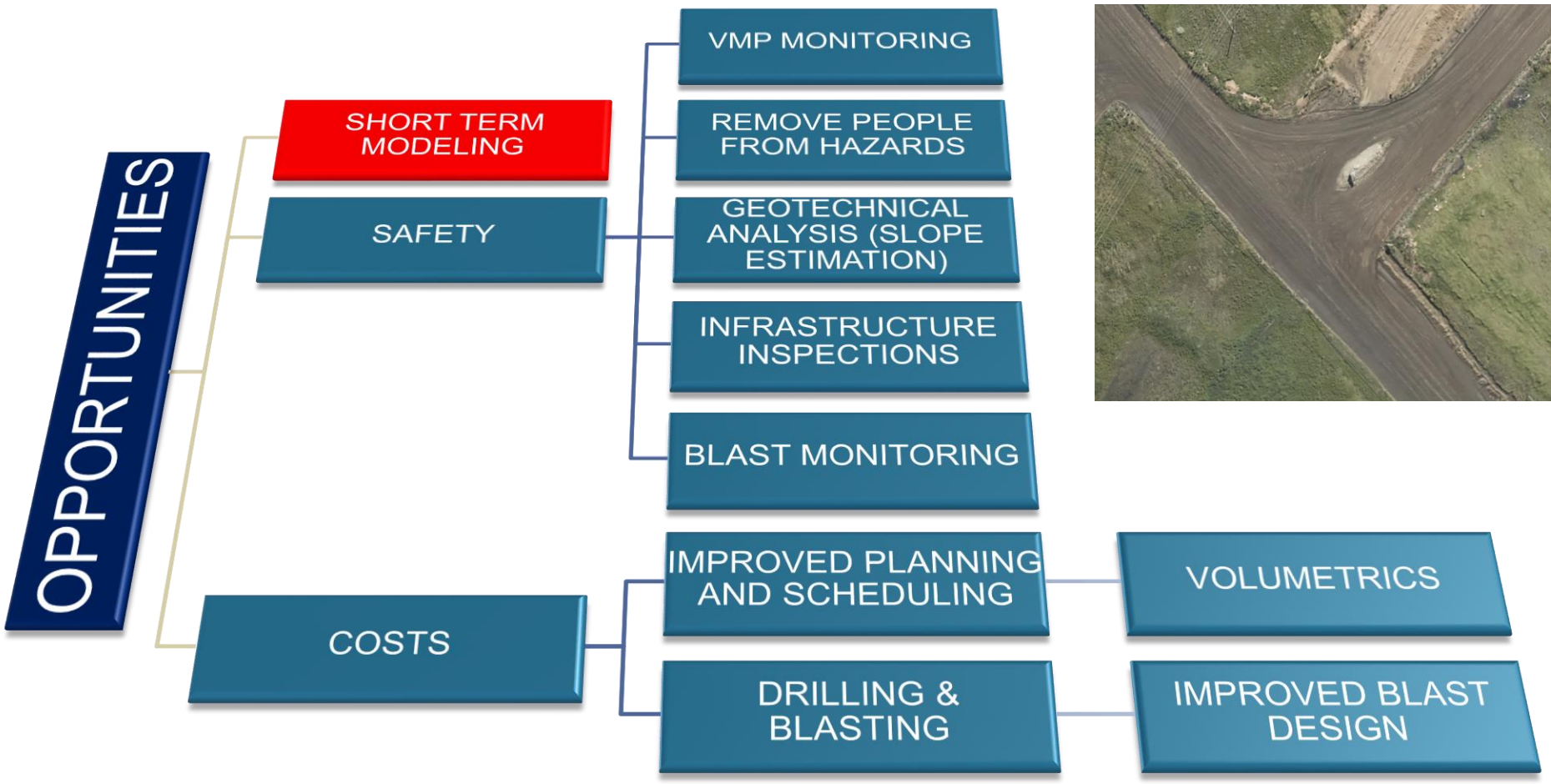


Softs: -53%
Hards: +17%

Softs: -44%
Hards: +13%



OTHER OPPORTUNITIES



CONCLUSIONS

- Inexpensive
- Safety, planning and improved financial analysis
- Future



ACKNOWLEDGEMENTS

- Isibonelo’s Survey Department
- P. Roberts Operational Geology Specialist
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- A. Opperman Resource Geology Specialist
- Divan Debruyn Resource Geologist
- Jaco Stark Vidblast
- Wikus Mahne Rock Engineering Specialist


THANK YOU.