

"End-To-End Automation For Orebody Knowledge. The application of machine learning and automation to unlock the value of geoscientific data and inform critical decisions in exploration and mining."



Presented by:

Michelle Carey

Chief of Strategy





Presented by:

Luisa Herrmann
Principal Geoscientist







# The Role of Geology in Decision Making

#### **Reducing Unquantifiable Errors**

When is visual observation not enough?

#### **Threats and Opportunities**

The rise of sensors and Al

Gescience capability gaps



Knowledge

No tactical adjustment to mine short term mine planning



**Decisions** 

33

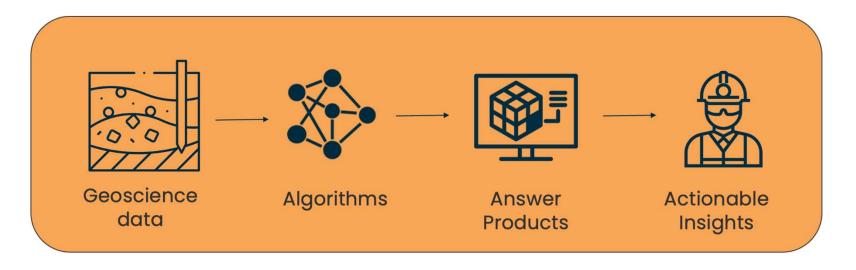




# **AUTOMATION OF OBK**

**Presentation Outline** 

- Current and future state of data collection and OBK
- Automated OBK examples from Datarock and IMDEX

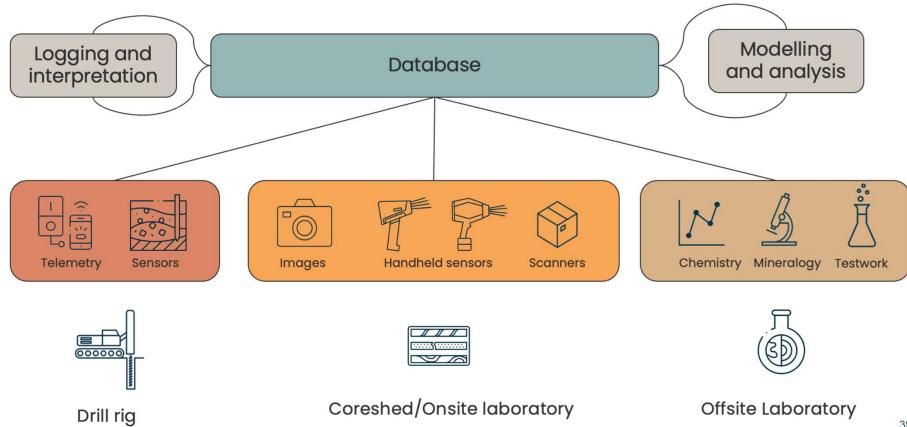






# **Current State**

**Human-centric workflows** 

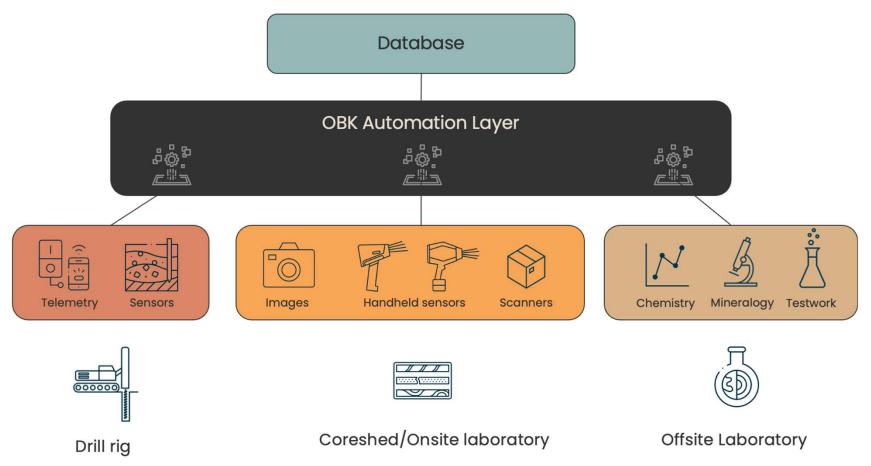






# **Future State**

Greater emphasis on data and algorithms

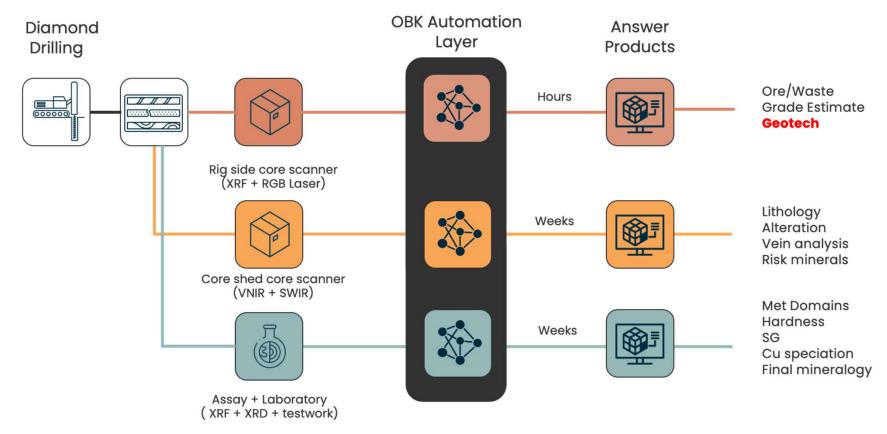






# **Example 1**

**Cu-Au Porphyry** 







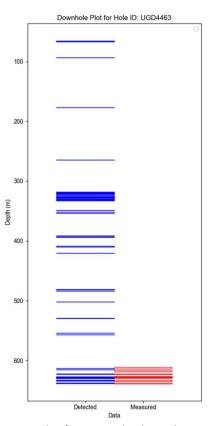
# **Automated Geotech**

Discing analysis from core imagery

# RGB CORE IMAGERY VISION ANALYSIS 628 627.78 628.54 629.29 630 630.86

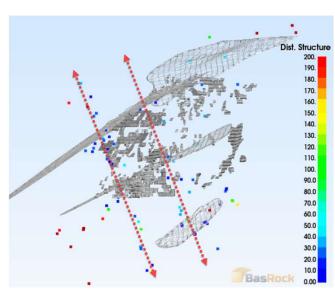
100km of core logged in a few hours using machine learning

# PREDICTED GEOTECHNICAL DATA



Analysis revealed under logging of discing intervals

#### **3D MODELLING**



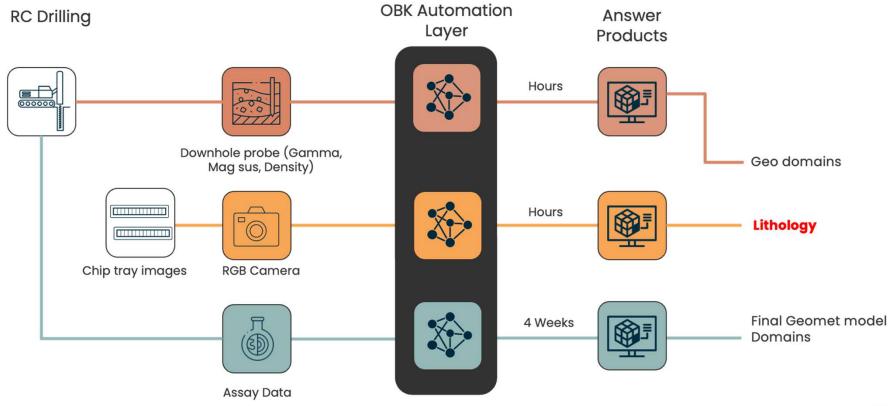
3D visualisation of automated discing results reveal new high strain zones





# **Example 2**

**Iron Ore** 





# Lithological domaining from chip images

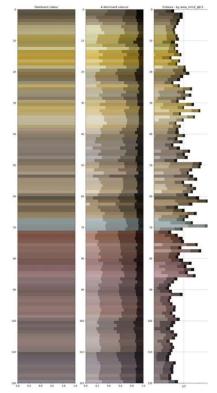
**Iron Ore** 

# RGB RC CHIP IMAGERY



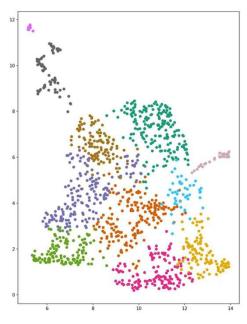
Massive amounts of chip imagery are collected for each 1m of RC drilling

#### **AUTOMATED IMAGE ANALYSIS**



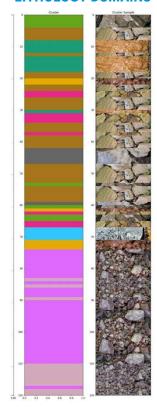
Imagery is analysed for colour, grainsize and texture, avoiding the need for manual visual logging

#### **DATA CLUSTERING**



Imagery data is domained into lithology groups using ML algorithms

#### **LITHOLOGY DOMAINS**

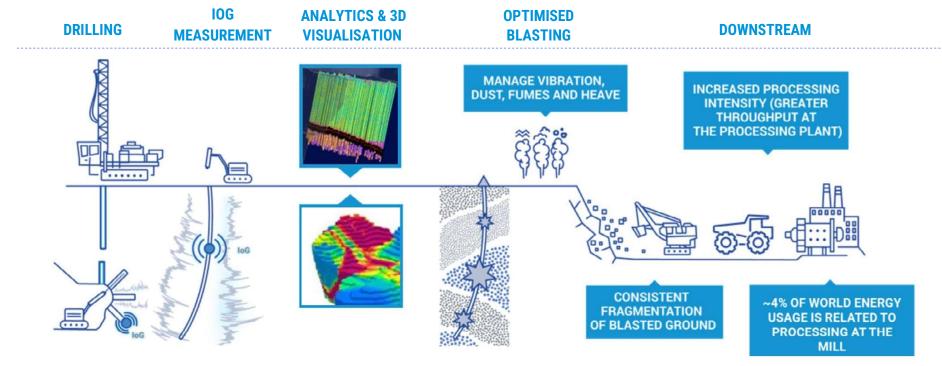


Data-driven lithology domains are produced automatically from imagery



# **Example 3 - BLASTDOG**

**Integrated process** 





Drill once, stabilising the walls of the hole to reduce fallback

#### **IMDEX BLASTDOG™**

Holes are logged using IMDEX multisensor, which measures physical properties

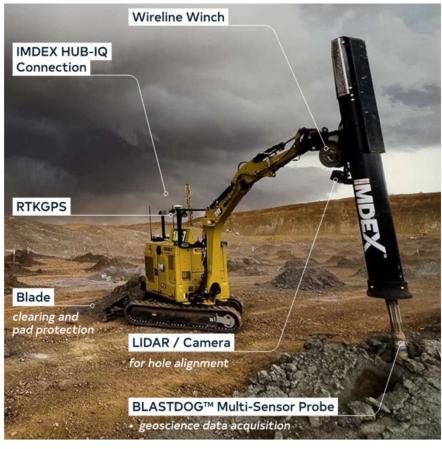
#### IMDEXHUB-IQ™ & MINEPORTAL

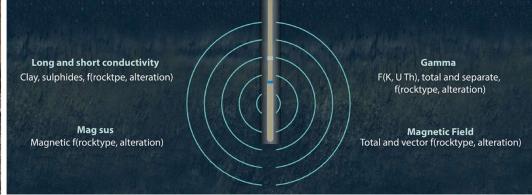
Analytics are applied to produce Rock Knowledge answer products (top) and 3D block models (bottom) Use the Rock Knowledge as input to the blast design via IMDEXHUB-IQ™ Mitigate risk and negative impacts on the blast by measuring hole gauge and reducing redrilling and improving the blast outcome Enhance productivity for resource companies



# **BLASTDOG**

**How the Need for Automation Drove Design** 

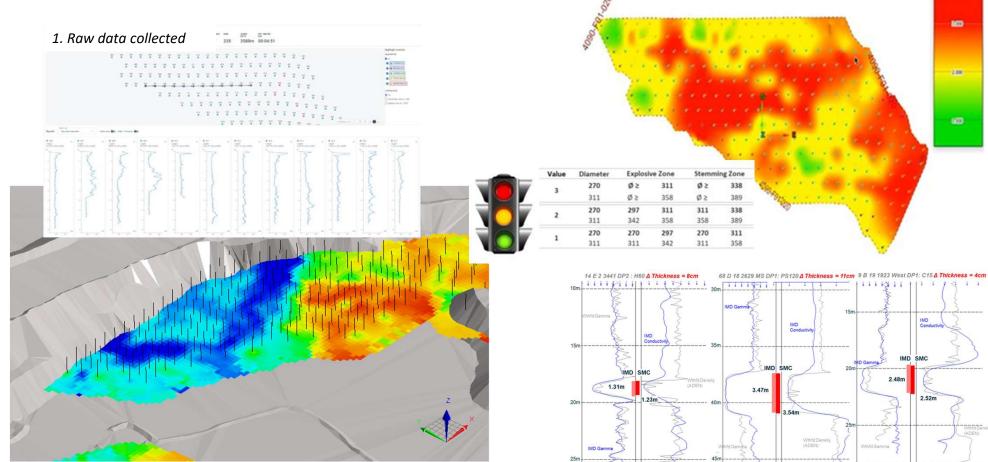






# **BLASTDOG**

#### **Data Use Cases**





# Thank you.

# **IMDEX**

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