ENHANCED BOREHOLE CAMERA

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BACKGROUND

- Sick of looking for an operational borehole camera, so I decided to build one.
- With the development of micro-controllers and robotics, adding sensors was inexpensive
  - Ultrasonic Range Finders
  - Infrared Temperature Sensors
  - Rotary Encoder
- Utilised freeware – Micro-Controller and Communications
- Overlay Software – Post Processing

3 ½ Series so far with the 4th in design
EBC mkI – PVC Pipe housing with off the shelf centraliser – 20m
EBC mkII – PVC Housing with off the shelf centraliser – Increased Depth – 40m
EBC mkIII – Legs modified and machined aluminium for strength – 60m
EBC mkIII.V – Further strengthening machined parts – Added sensors – Up to 100m
EBC mkIV – Multiple Cameras - retractable centraliser - bore tracking – ruggedized sensors
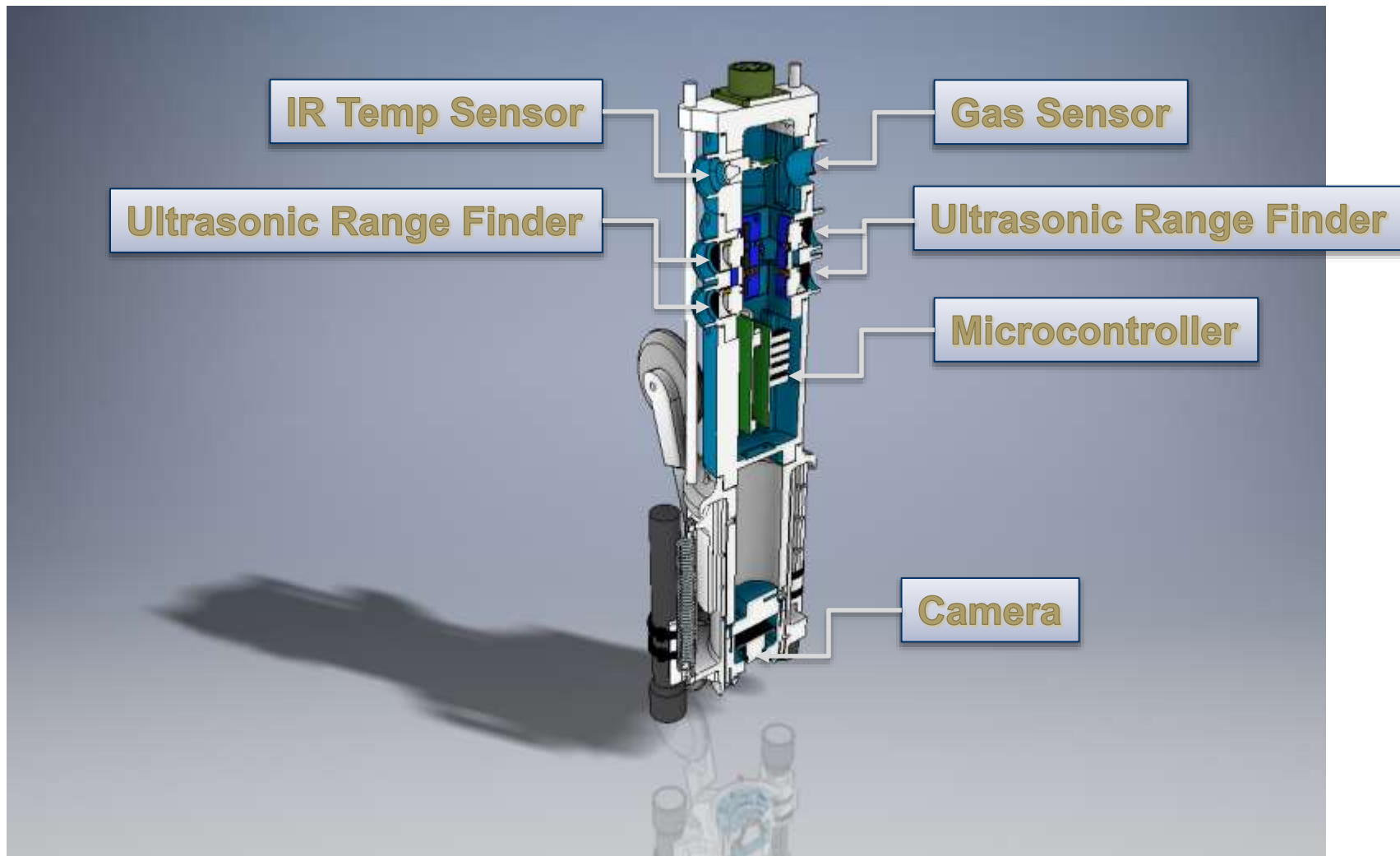
EBC EVOLUTION
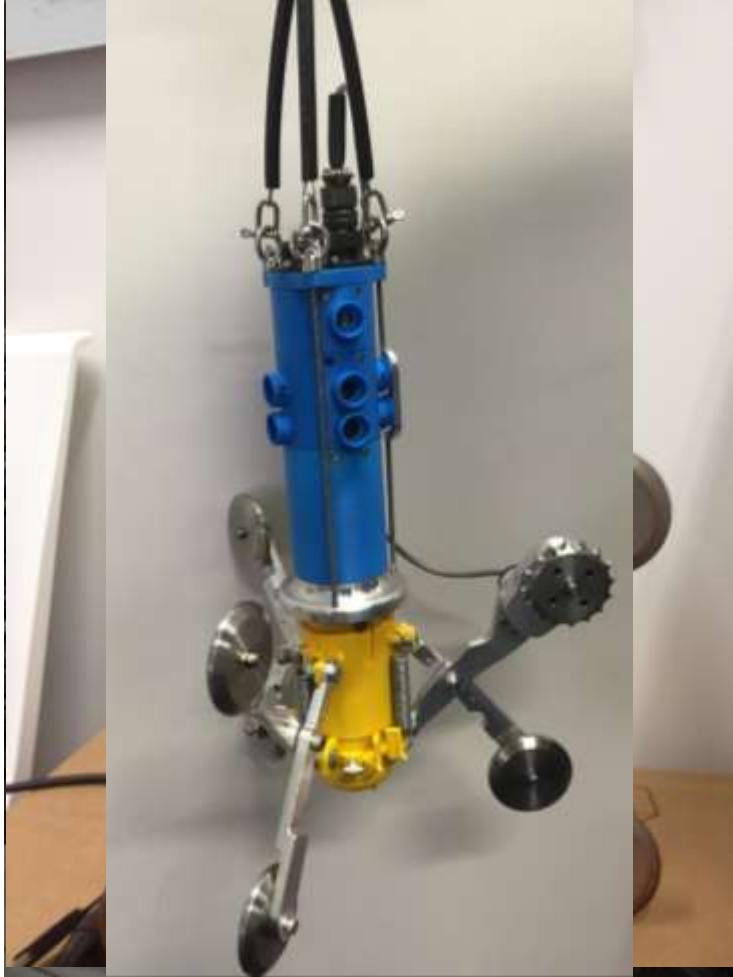
EBC mkI – PVC and Off the Shelf Stabiliser – 20m

EBC mkII – PVC and Off the Shelf Stabiliser – 40m

EBC mkIII – 3D Printed Housings and Off the Shelf Stabiliser – 60m

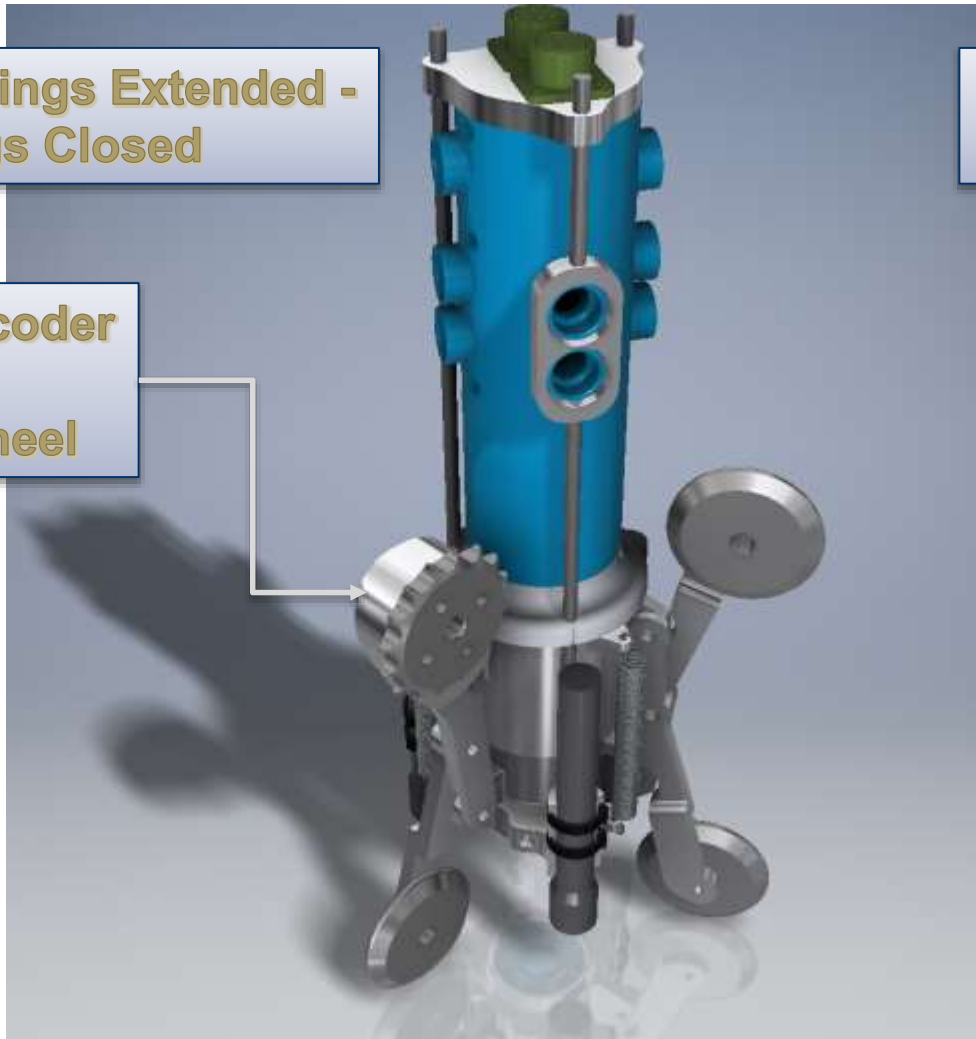EBC mkIII.V – 3D Printed Housings – Strengthened Legs – Additional Sensors – up to 100m

THE GUTS

IR Temp Sensor

Gas Sensor

Ultrasonic Range Finder

Ultrasonic Range Finder

Microcontroller

Camera

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CENTRALISER

Springs Extended - Legs Closed

Optical Rotary Encoder Operated from a geared-toothed wheel

Springs Relaxed - Legs Open

Dynamically adjusts to Borehole walls
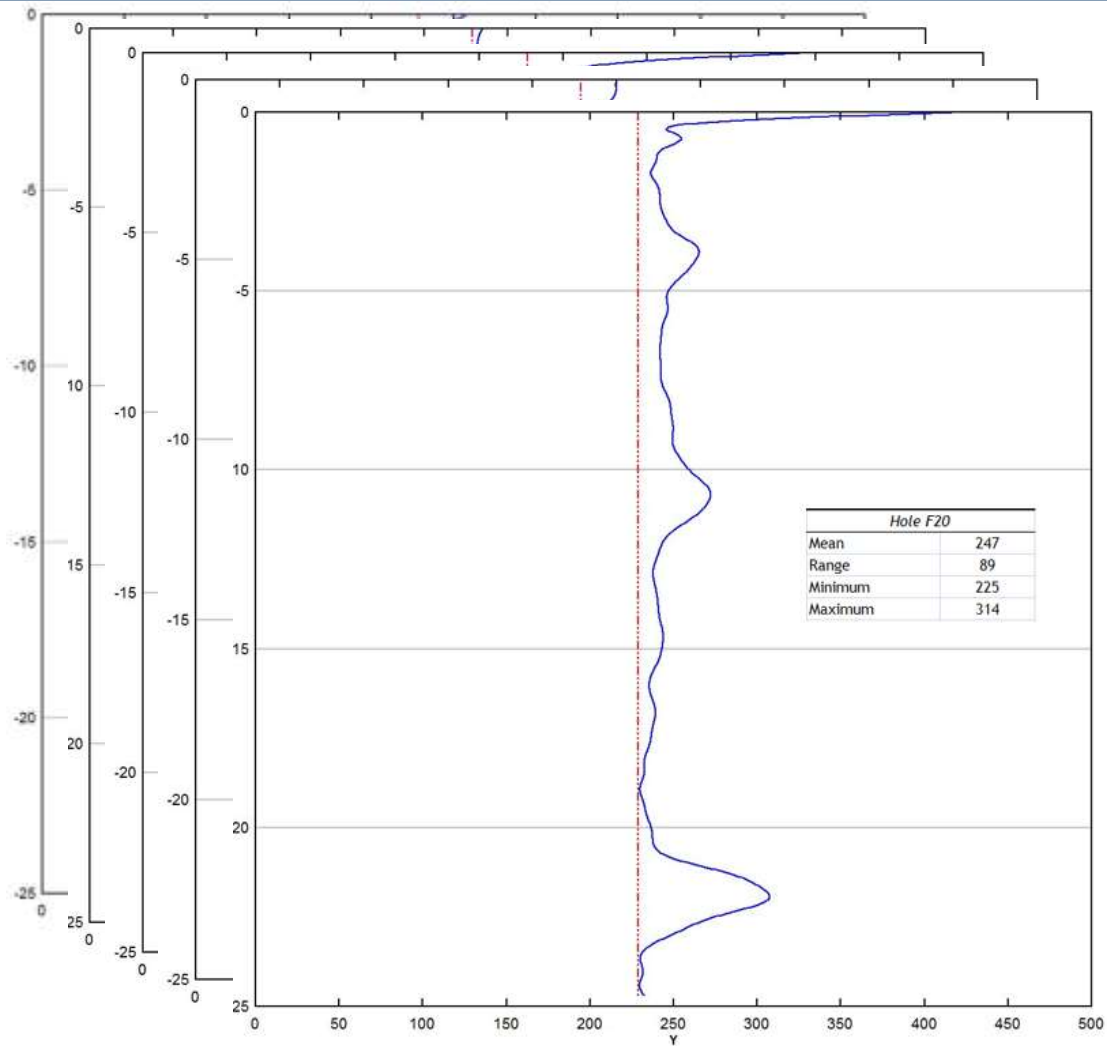
HOLE SIZES

210 mm

380 mm

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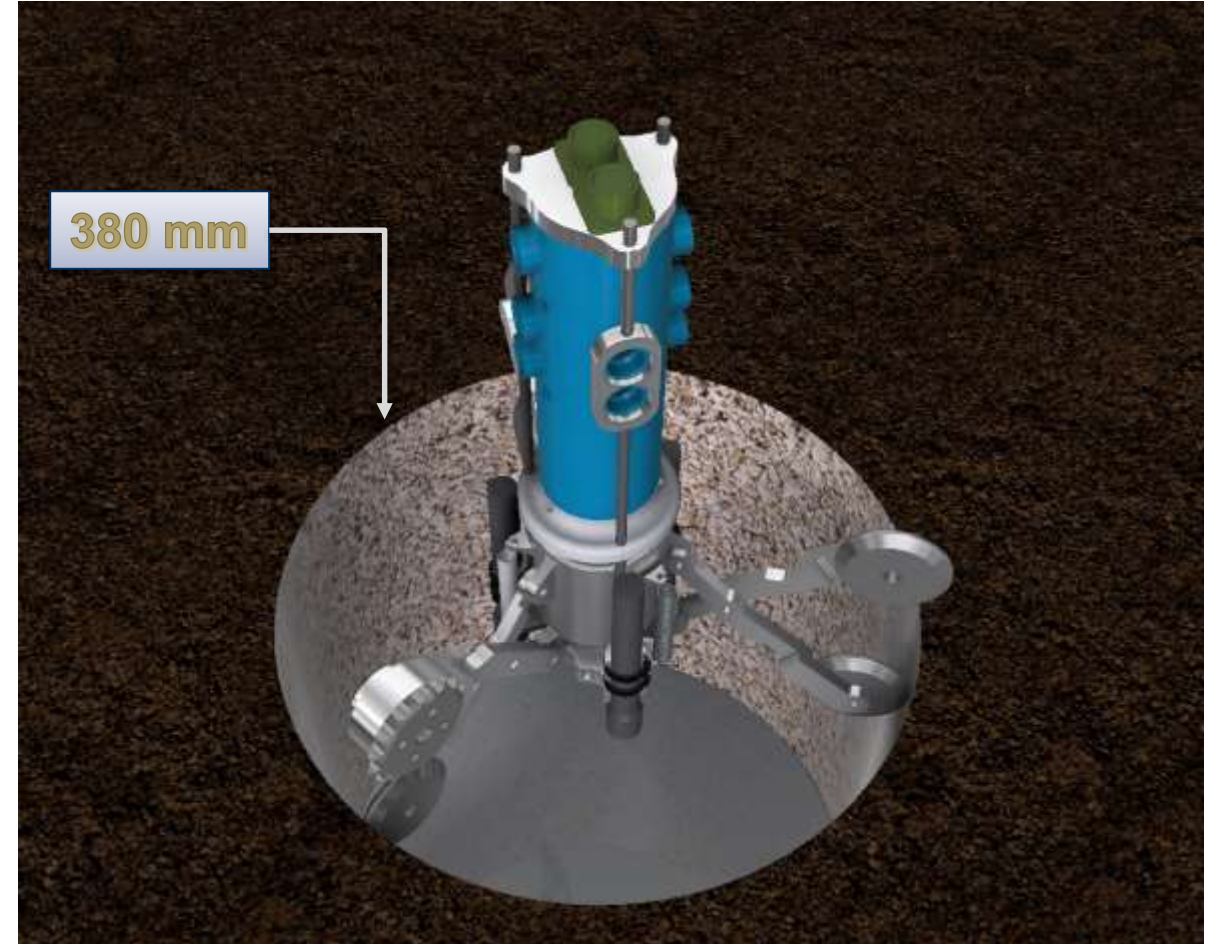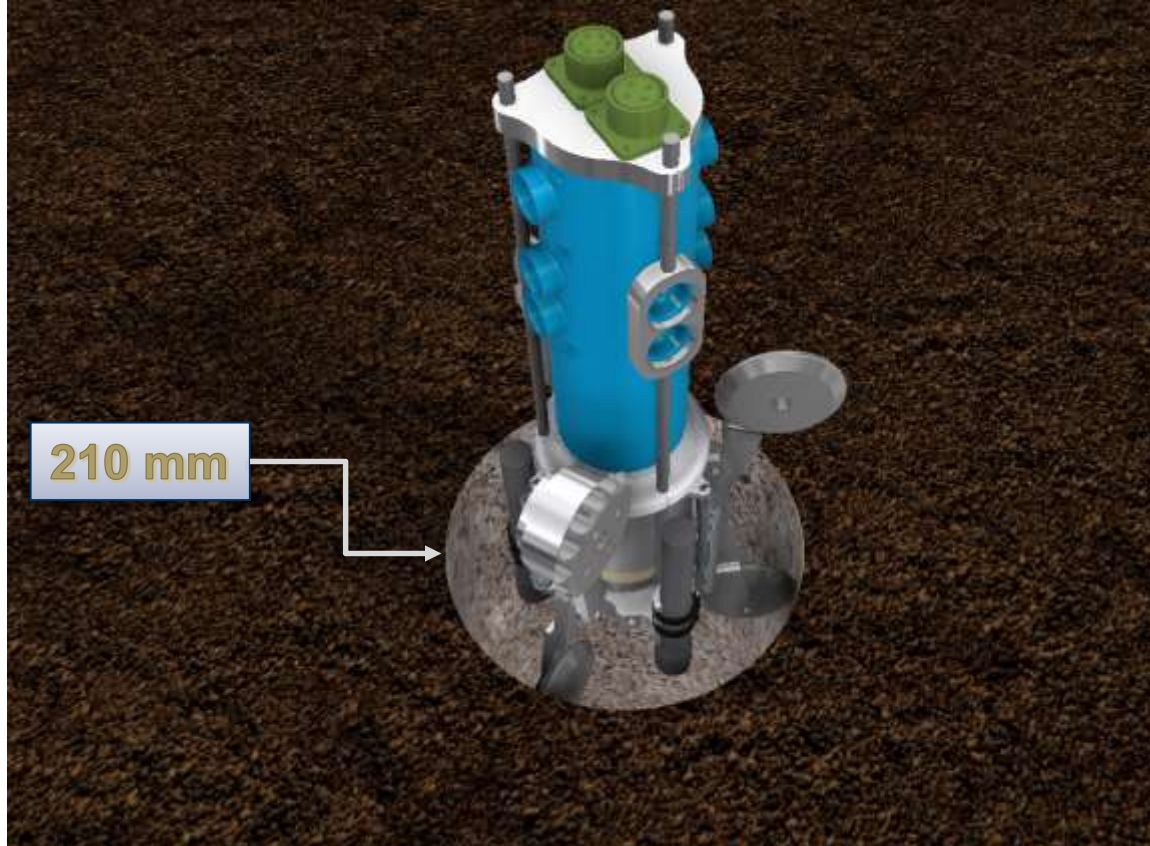
SPECIFICATIONS

- Diameter 210 mm – 380 mm for centraliser
  Measures 160 mm to 6000 mm
- Temperature -30° C to 220° C
- Depth Up to 100 m
- Methane 200 – 10,000 ppm
- Water Resistant
  - Ingress areas
  - IR Temp sensor
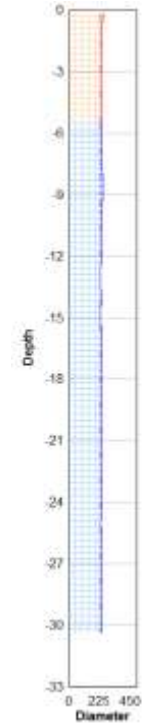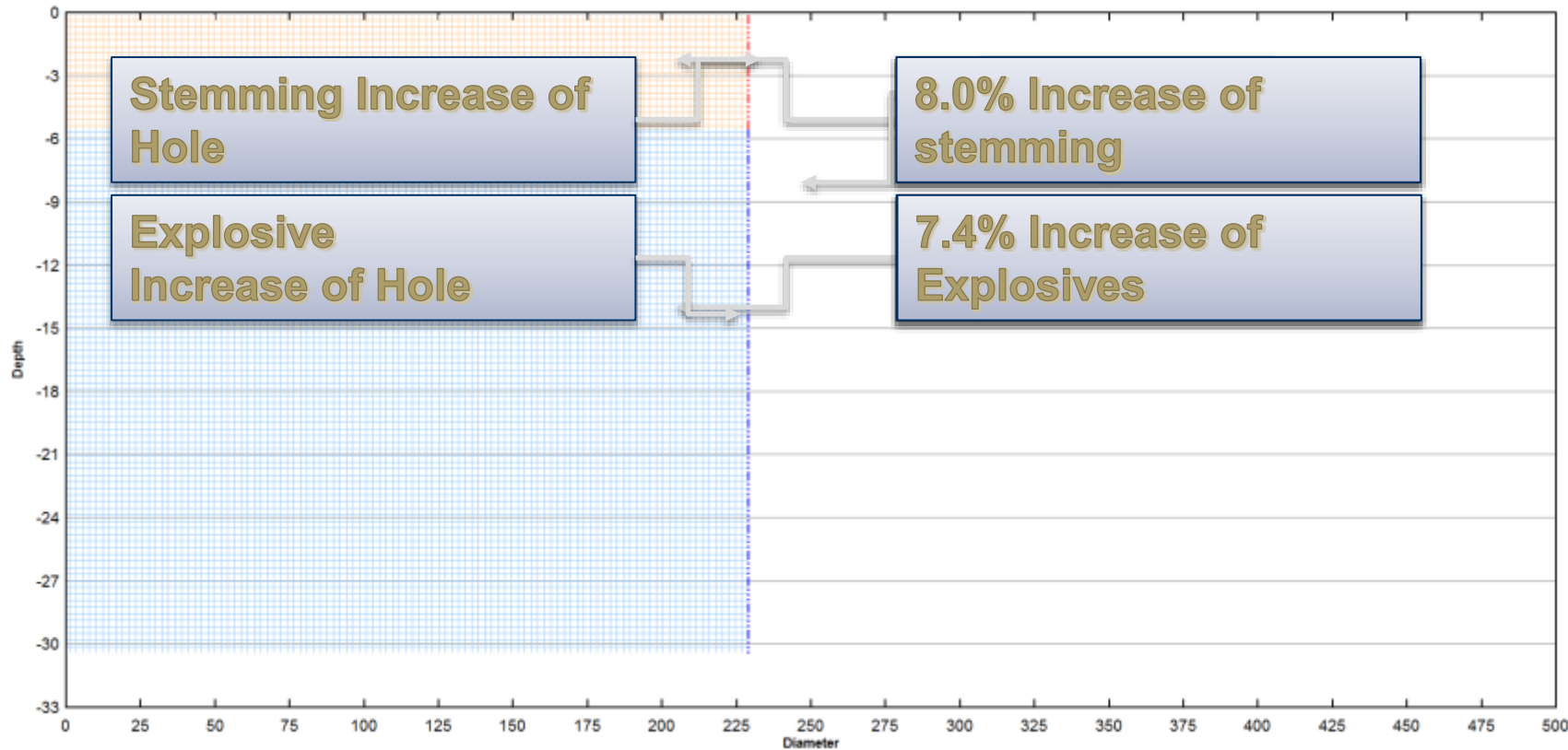 - Ultrasonic Range Finders
  - Methane Sensor
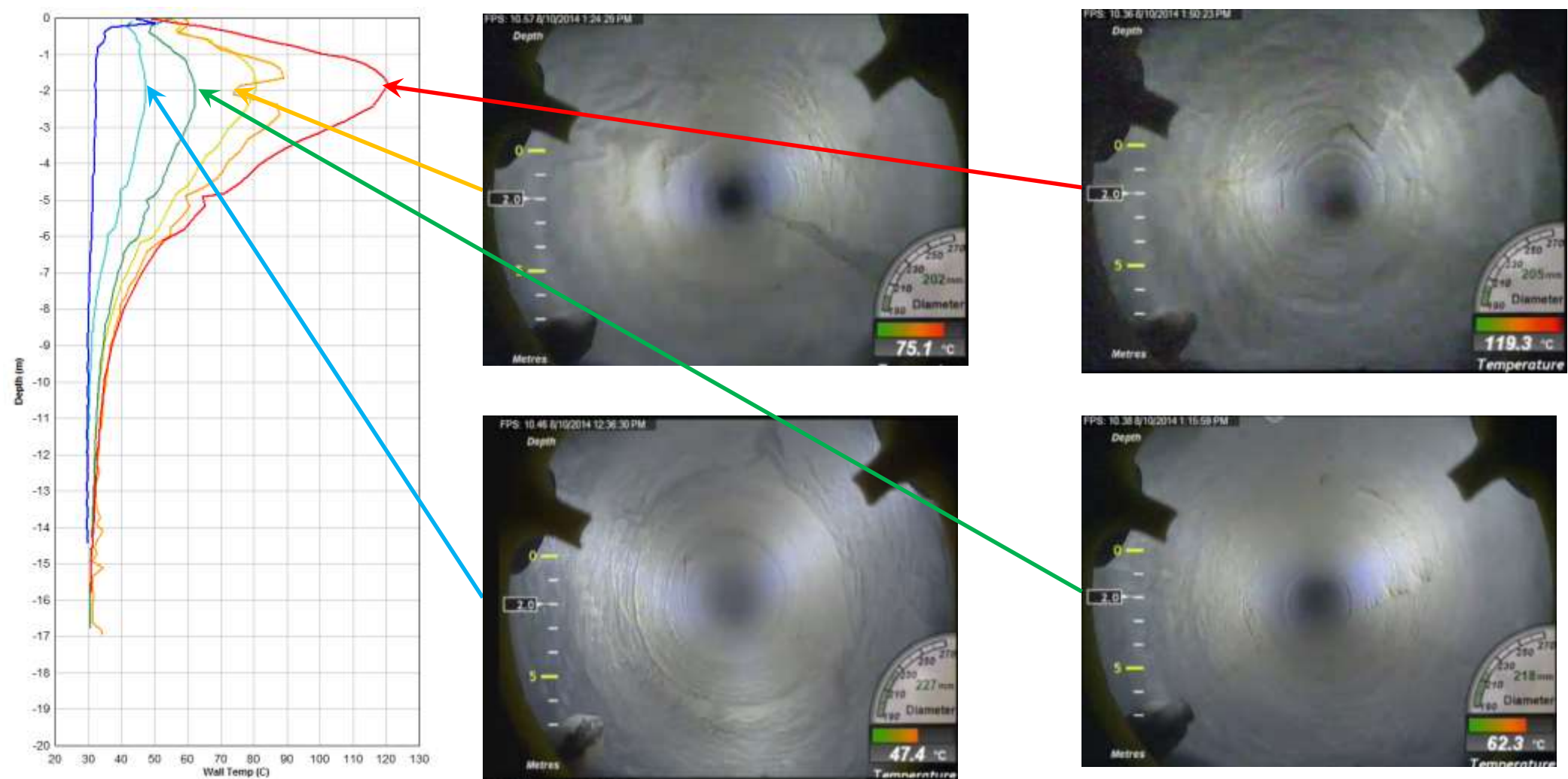
Soon to add pitch and roll for bore tracking

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HOLE PROFILES

Hole F20	
Mean	247
Range	89
Minimum	225
Maximum	314

DIAMETER IMPACT

Stemming Increase of Hole

Explosive Increase of Hole

8.0% Increase of stemming

7.4% Increase of Explosives

100x Horizontal Exaggeration

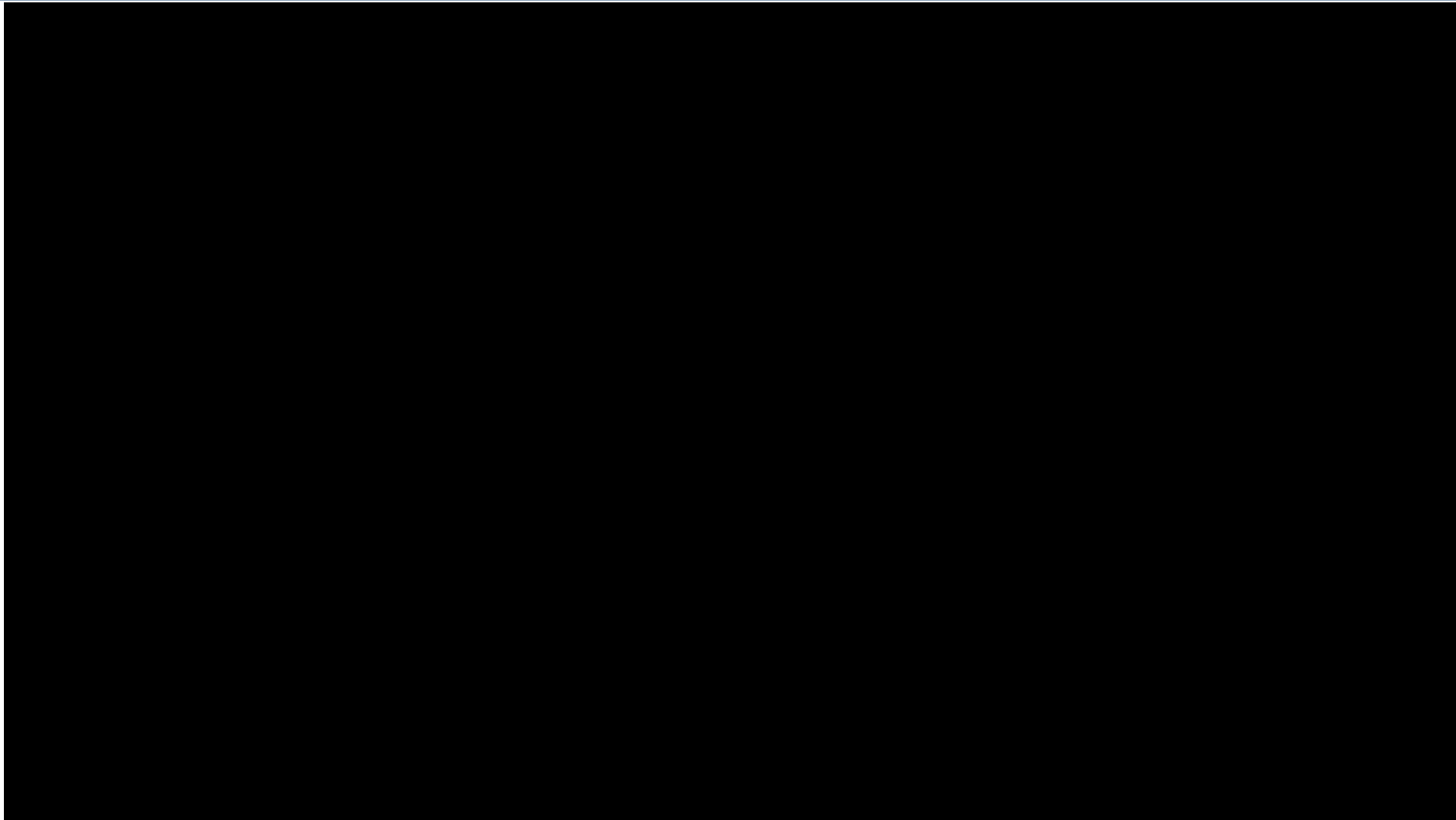# TEMPERATURE PROFILES

EBC EXAMPLE VIDEOS

THANK YOU

QUESTIONS?