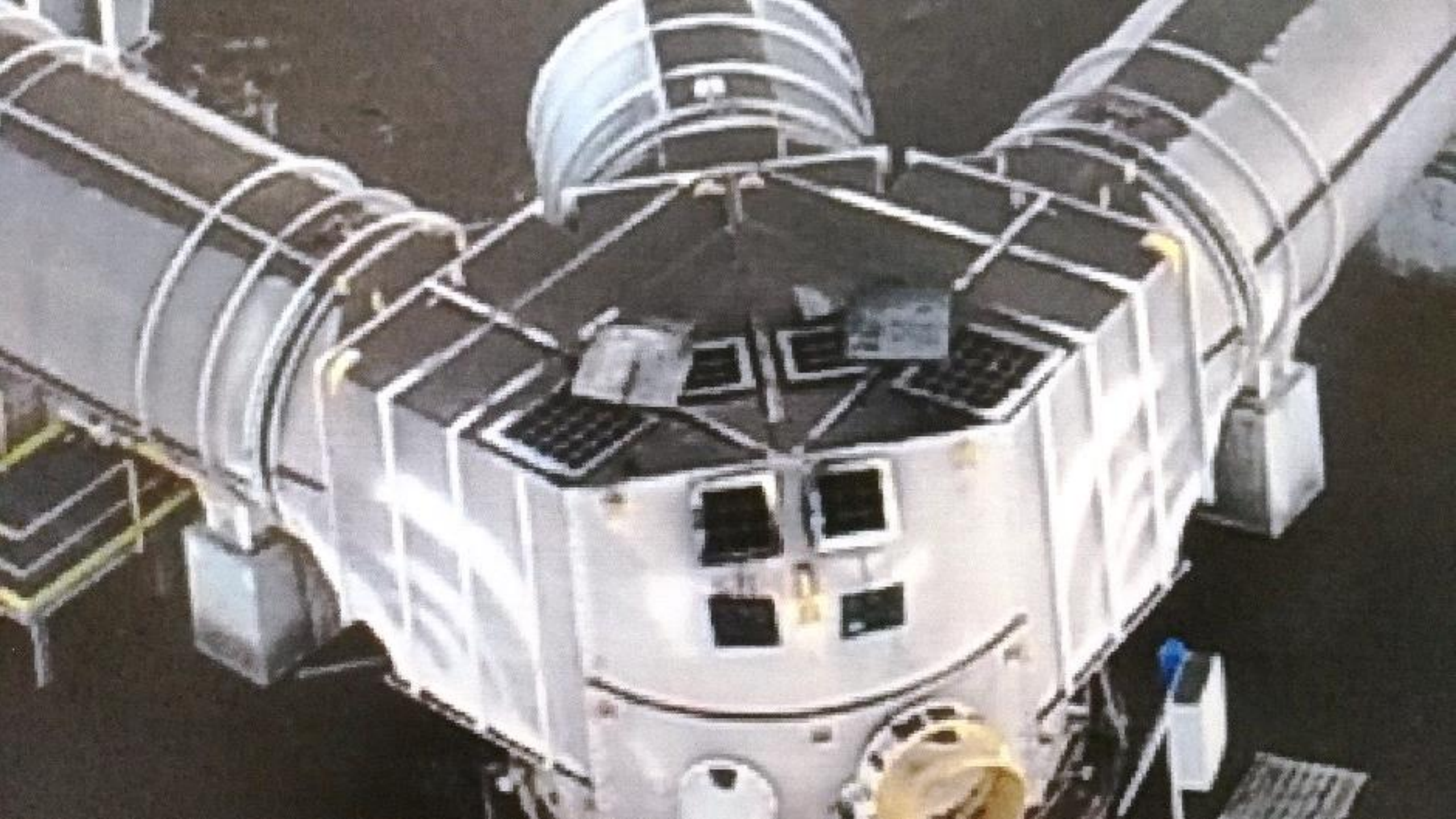
North Goonyella Spontaneous Combustion

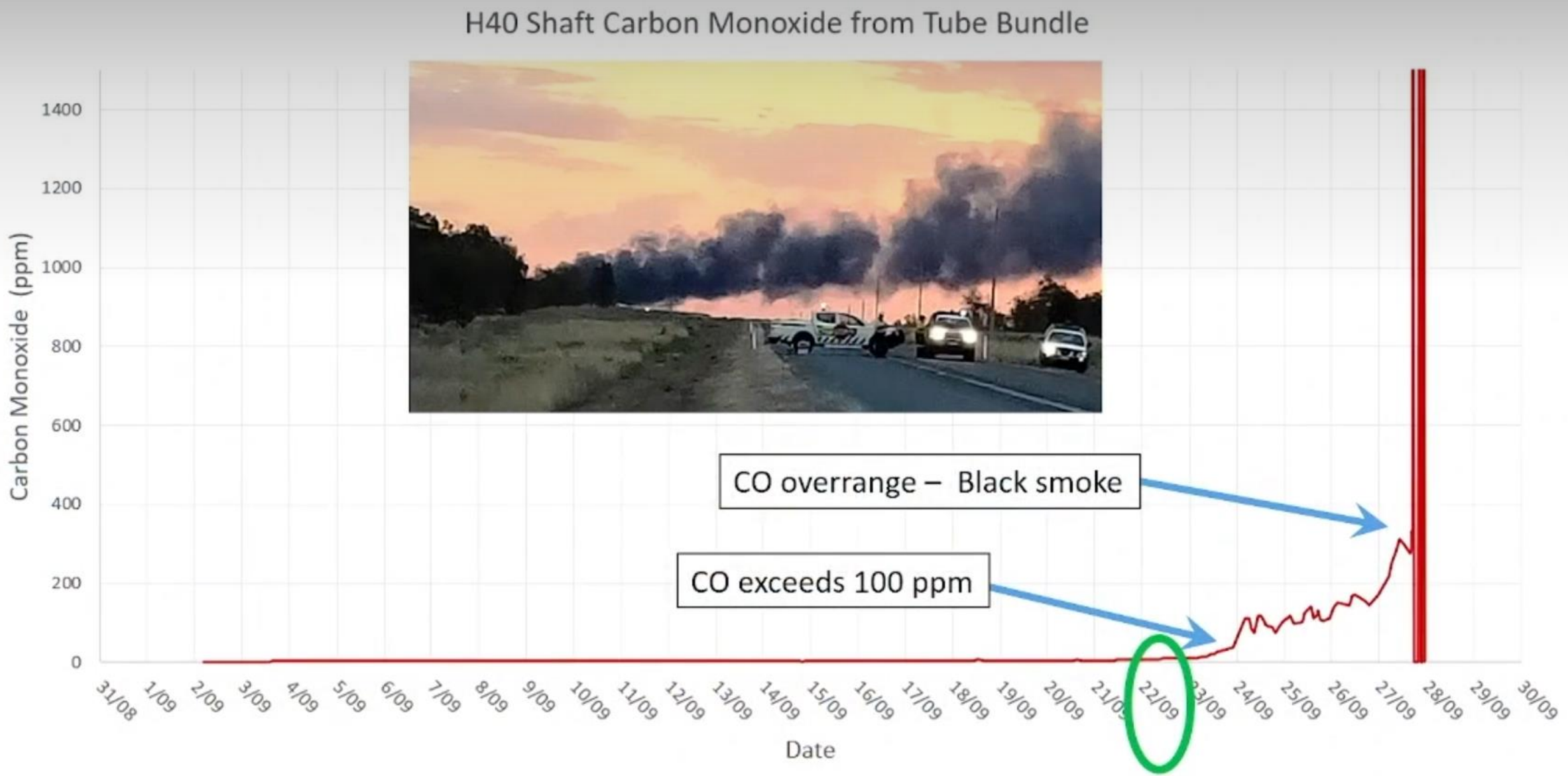
September 2018


North Goonyella
27 Sept 2018
Main shaft

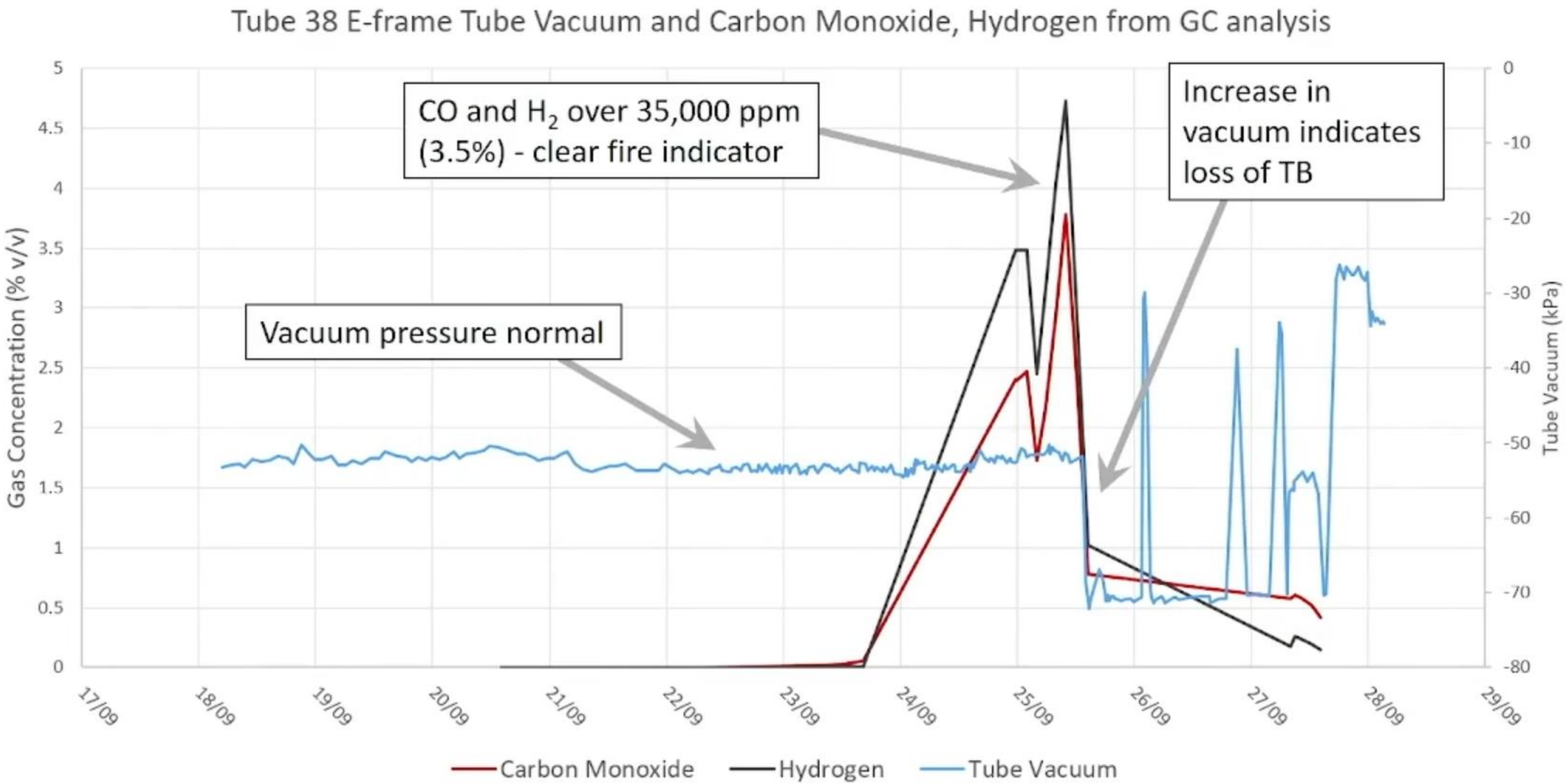


- The North Goonyella Coal Mine developed a spontaneous combustion of coal in the 9 North Longwall Goaf area during the longwall recovery in August and September 2018.
- RSHQ have not provided any report into the event.
- The Underground Mine Manager, Marek Romanski and Ventilation Officer, Dennis Black, had their Certificates of Competency Suspended by the CEO of RSHQ. 7 years later it is still not resolved.
- There has been no official report into the event, despite it being the most significant underground event in Queensland in 25 years since the Moura 2 mine disaster.
- The following presentation has been created from the presentation at the 2022 QLD Mining Industry Health and Safety Conference by Inspector Laurie Crisp. Crisp - Post-Incident Learnings from a Major Spontaneous Combustion Event - Queensland Mining Industry Health & Safety Conference
- I don't think the presentation is very good, but it is the only information available.

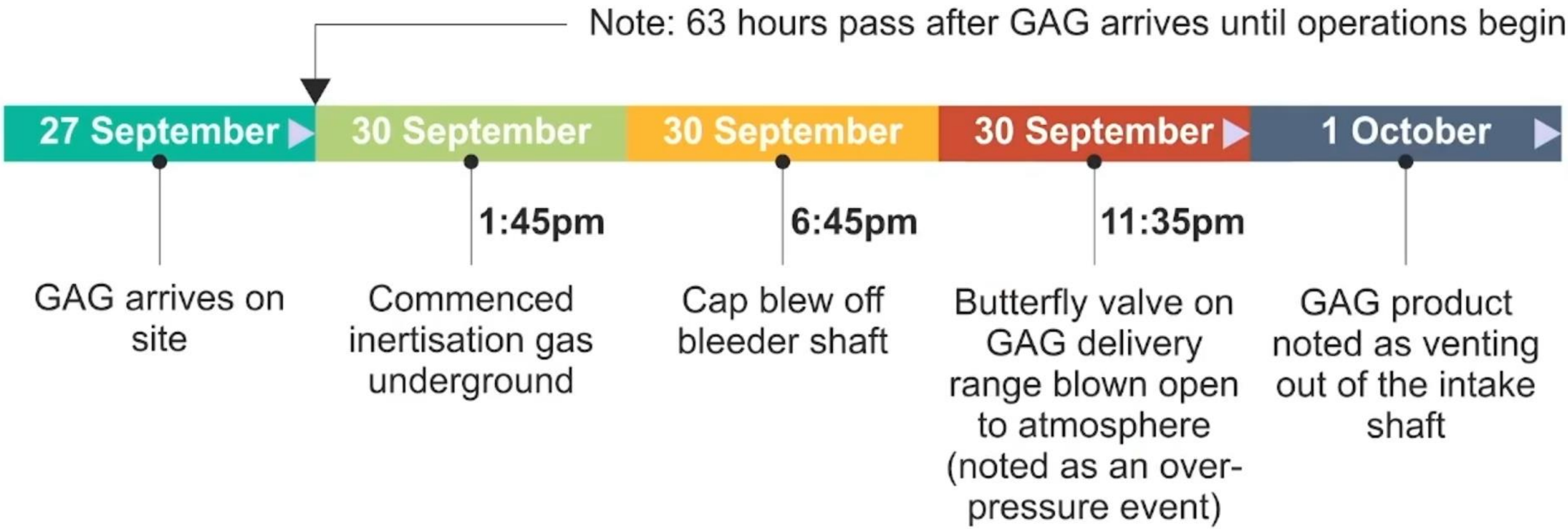
Carbon monoxide increases at return shaft to over 100ppm on the 24th of September. Off scale 27th September, shaft discharging black smoke



Carbon monoxide and Hydrogen at high levels indicate concentrated fire gases at the E-Frame tube

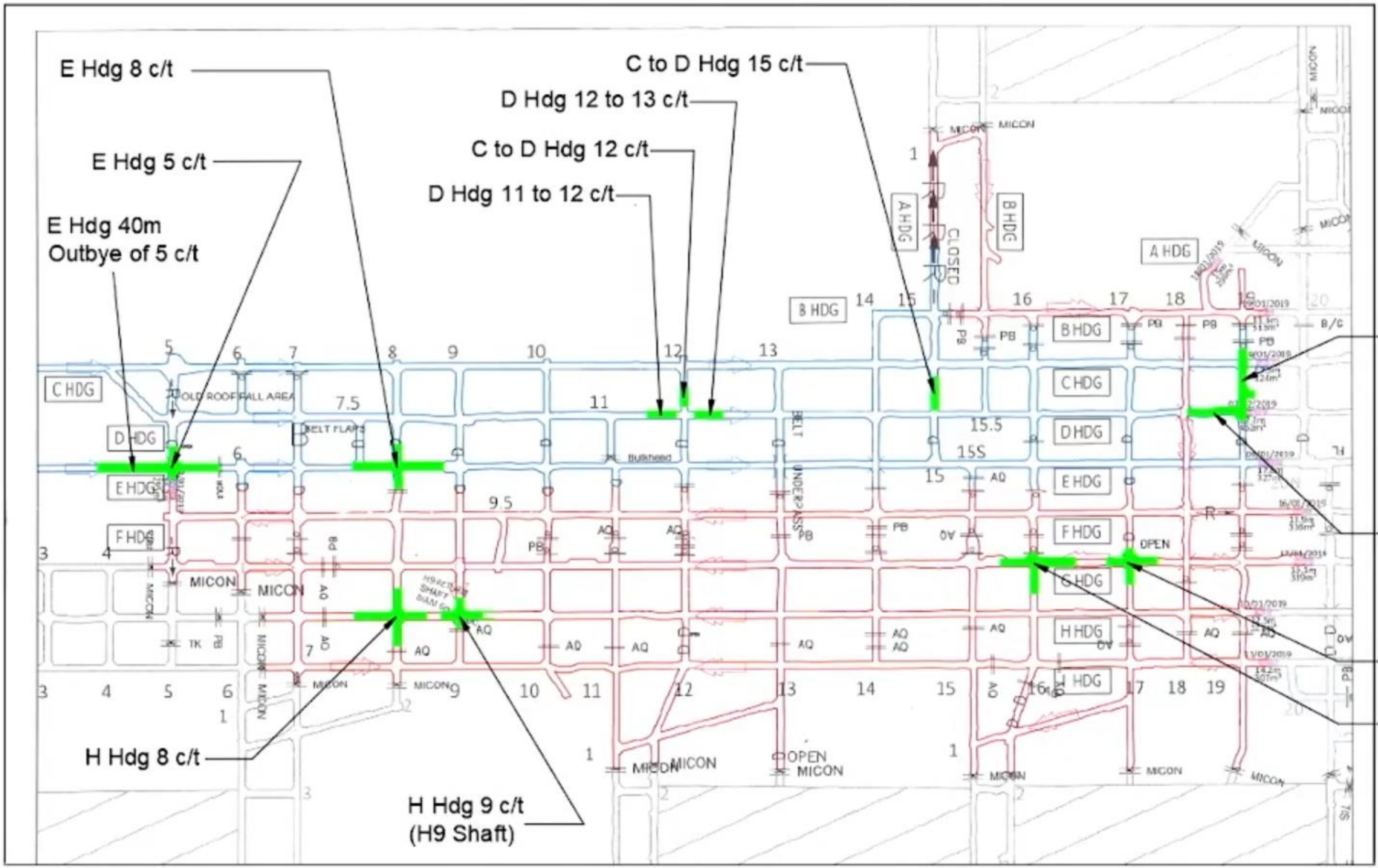


QMRS GAG timeline

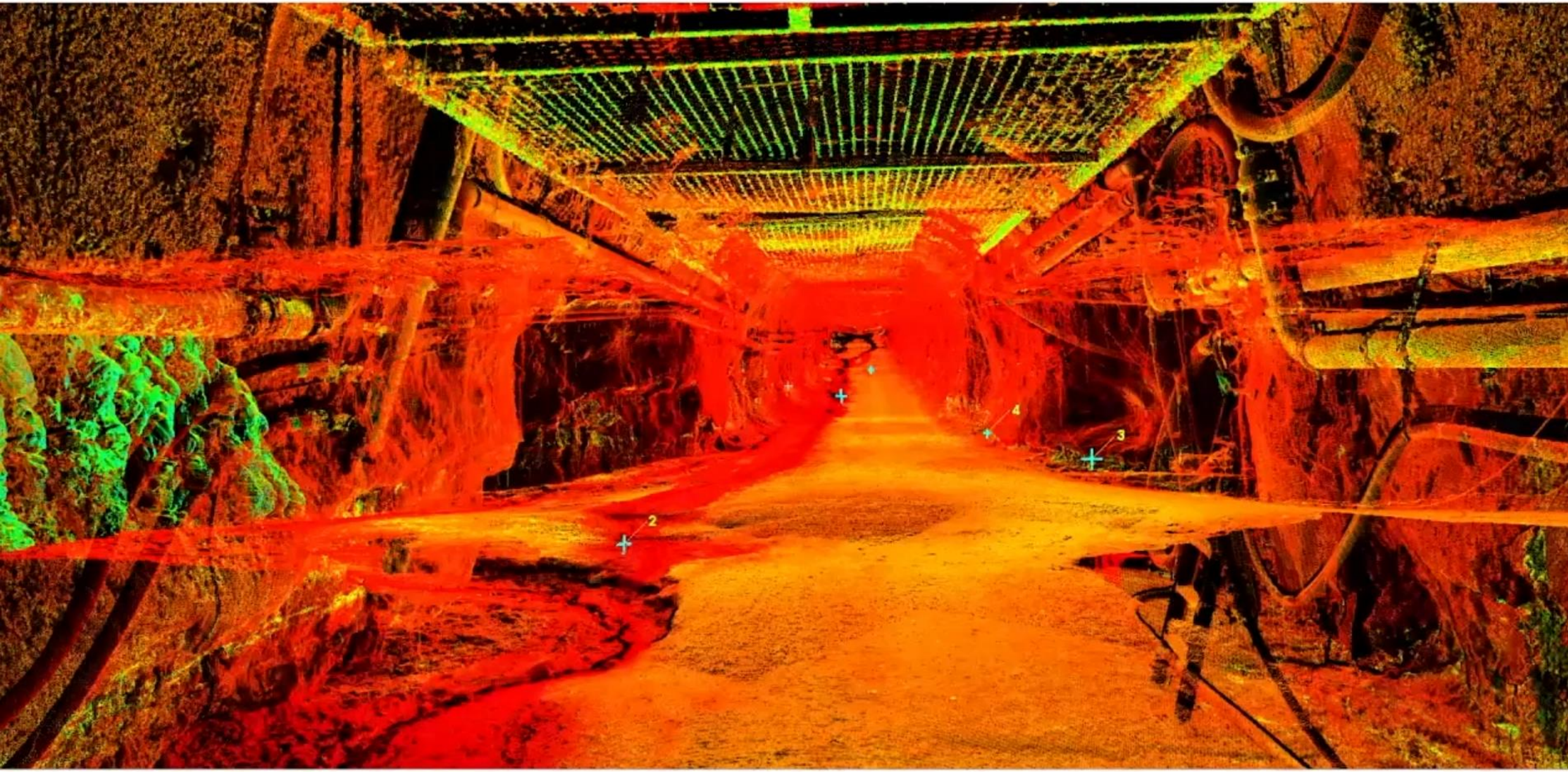


GAG set-up on bleeder shaft

Mine Map – Scan locations



Roadway - E Hdg 5 C/T (Laser image)



Galvanised Butterfly Plates

G to H Hdg 8 C/T

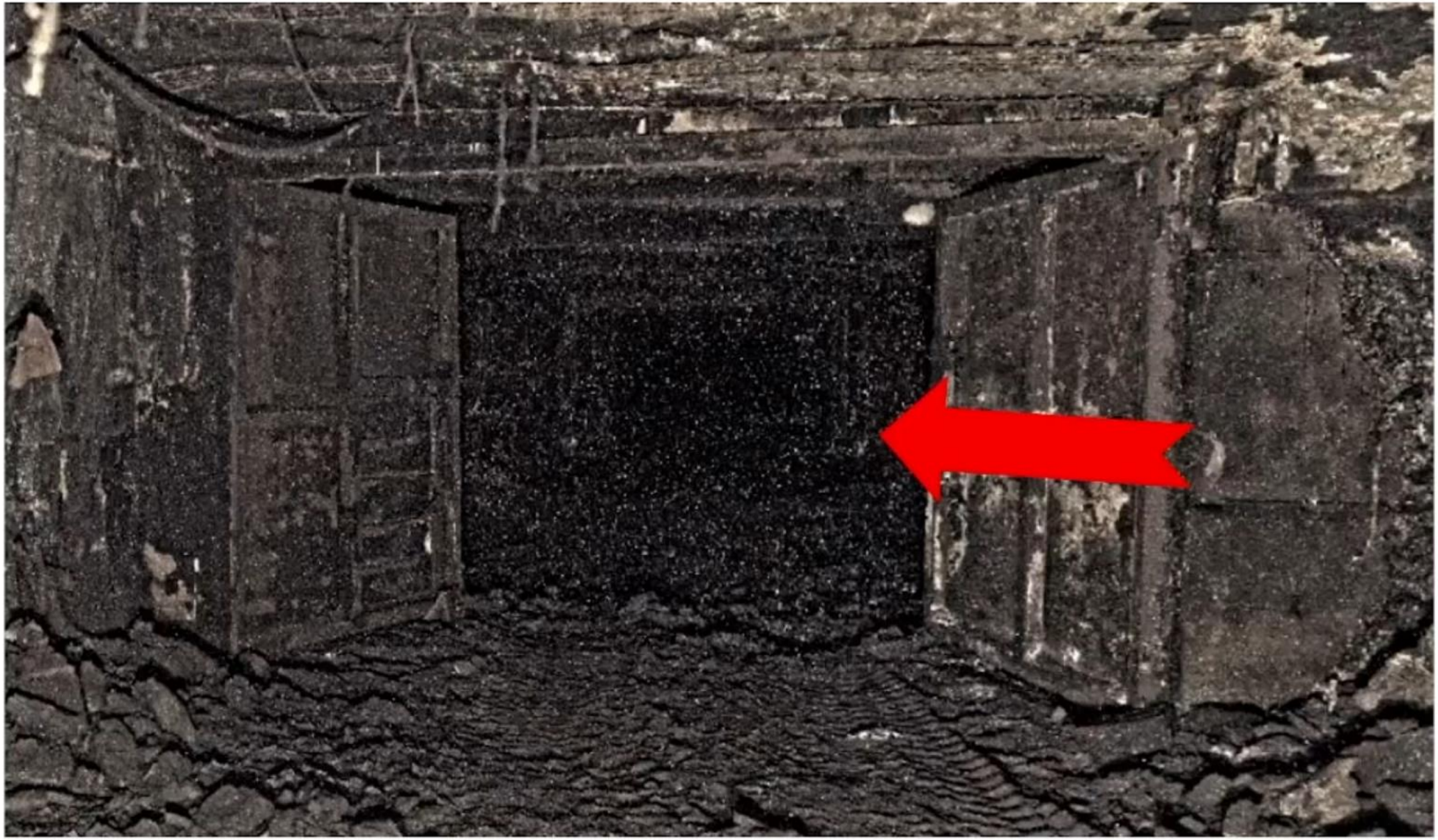
Electrical Equipment HT Cables

Main ventilation fans

Laser scan image

- Initially, intakes remained as intakes, returns remained as returns.
- As access to the main shaft became closed-off, air reversal occurred resulting in the main air intake shaft and drift becoming exit points for POCs.
- Loss of ventilation shaft reverses the outbye section of the ventilation circuit.

Ventilation Doors



Intake to return regulator

Ventilation direction **before** event

Ventilation direction **after** event

Intake and return sides of ventilation structures
(2-3 km outbye of the mine fire)

Borehole Camera Footage

- Conveyor belt disintegration

  (NIOSH testing – Similar conveyor belt)

  310°C

- Deformed belt structure mains belt road

  (ASME B31.1-1995)

  400°C to 500°C

- Carbon steel melting point

  1350°C - 1530°C

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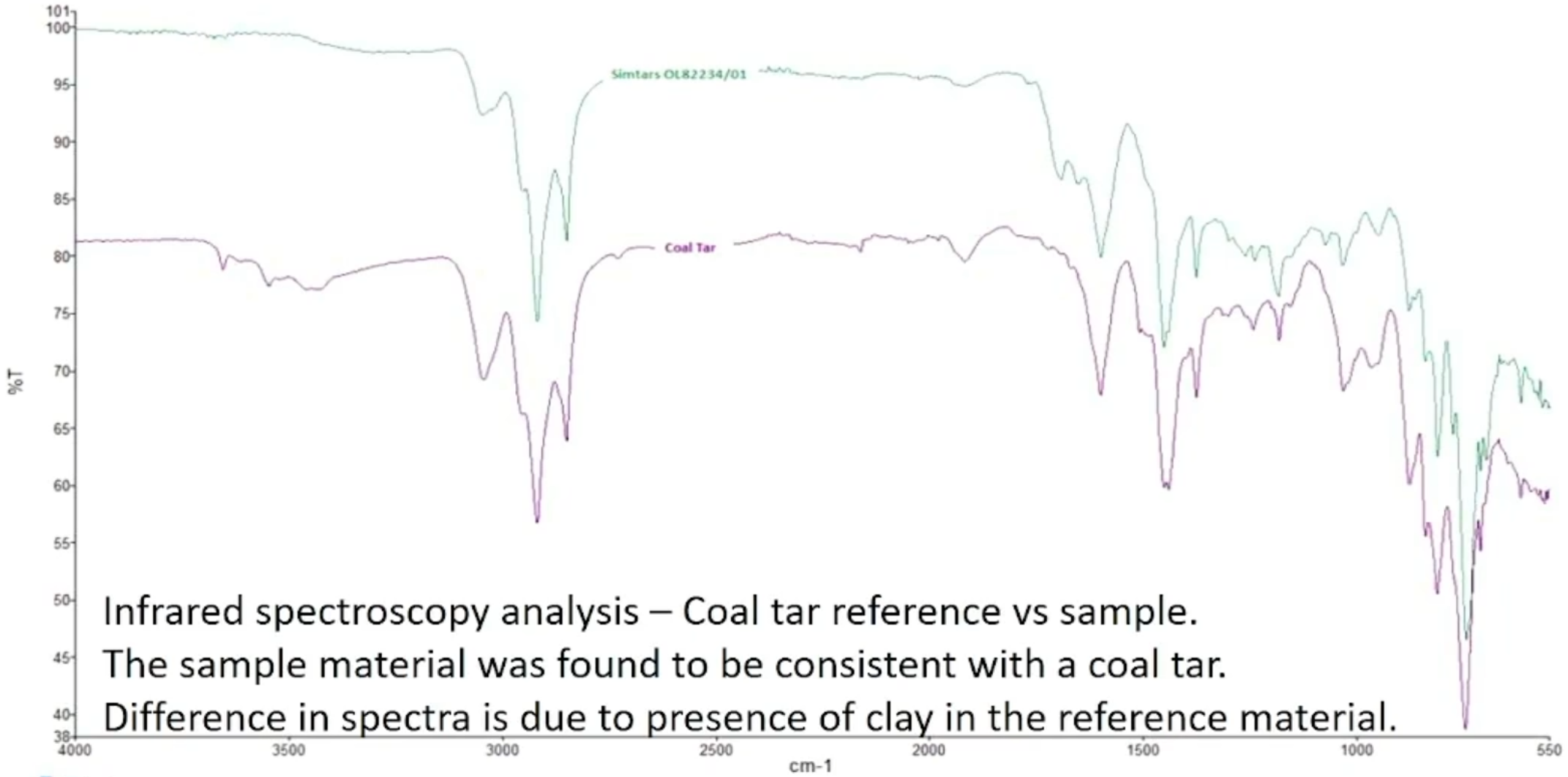
Coal tar deposits (several locations)

- The coal tarring occurred at temperatures above **800°C** (presence of naphthalene)
- Temperature is consistent with the deformed steel structures
- Coal tar remains vaporised until the gas carrying it is cooled, when it either condenses on a cool surface or remains in fine aerosol drops

Coal tar deposited at shaft bottom
(**2-3 km** from source)

Coal tar sample analysis



Infrared spectroscopy analysis – Coal tar reference vs sample.

The sample material was found to be consistent with a coal tar.

Difference in spectra is due to presence of clay in the reference material.

Spectrum 100 FTIR PerkinElmer

UQMP

What should we take away…

1. Information gathering is critical for decision making
   - 3D Laser (LiDAR) Scanning
     - Developed process during the post-incident study
     - Become routine tool used during investigations
   - Samples, photos, interviews
2. Tube bundle readings are essential to help understand the progression of events at different stages
   - Locations and **survivability** of tube bundles are critical
   - Better understanding is required of the limitations of this information in extreme events

3. Exclusion zones

- Mines need to understand the potential for disruption to essential service infrastructure during extreme events
- **Advanced planning** is required
- Mine emergency exercises must consider potential **exclusion zones**

4. GAG docking facilities

- Ensure GAG docking stations are outside of exclusion zones
- All GAG docking facilities to be constructed in **consultation with QMRS**
- All GAG docking facilities (not just the primary docking point) to be periodically tested by QMRS