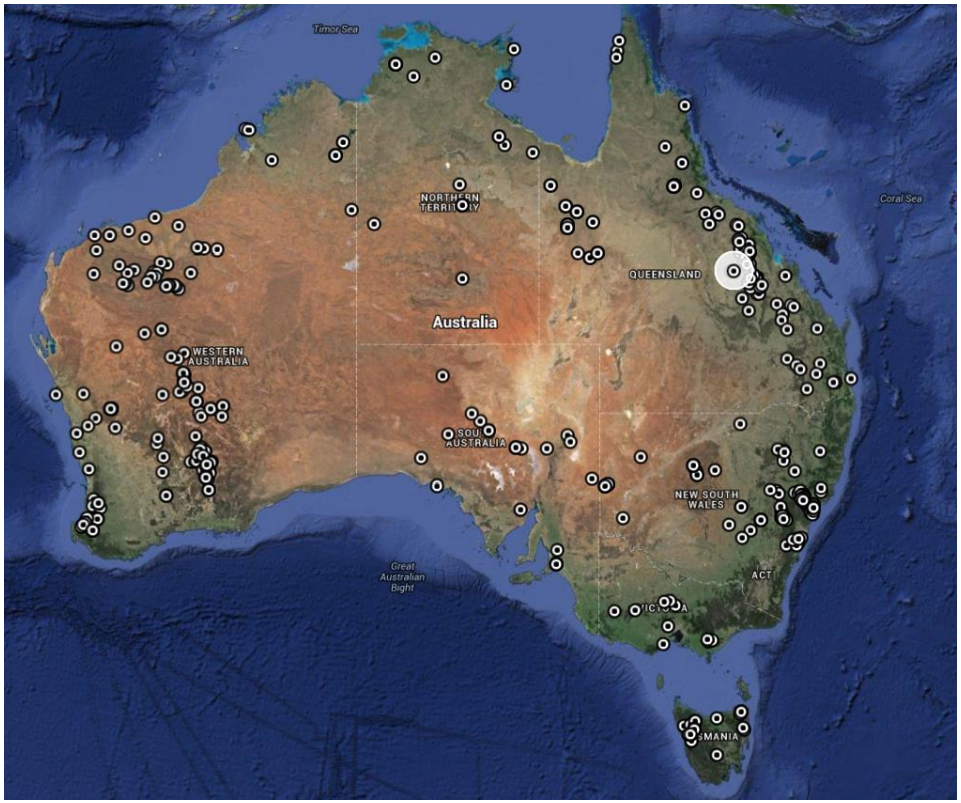
Unplanned initiation

Clermont

24th November 2017

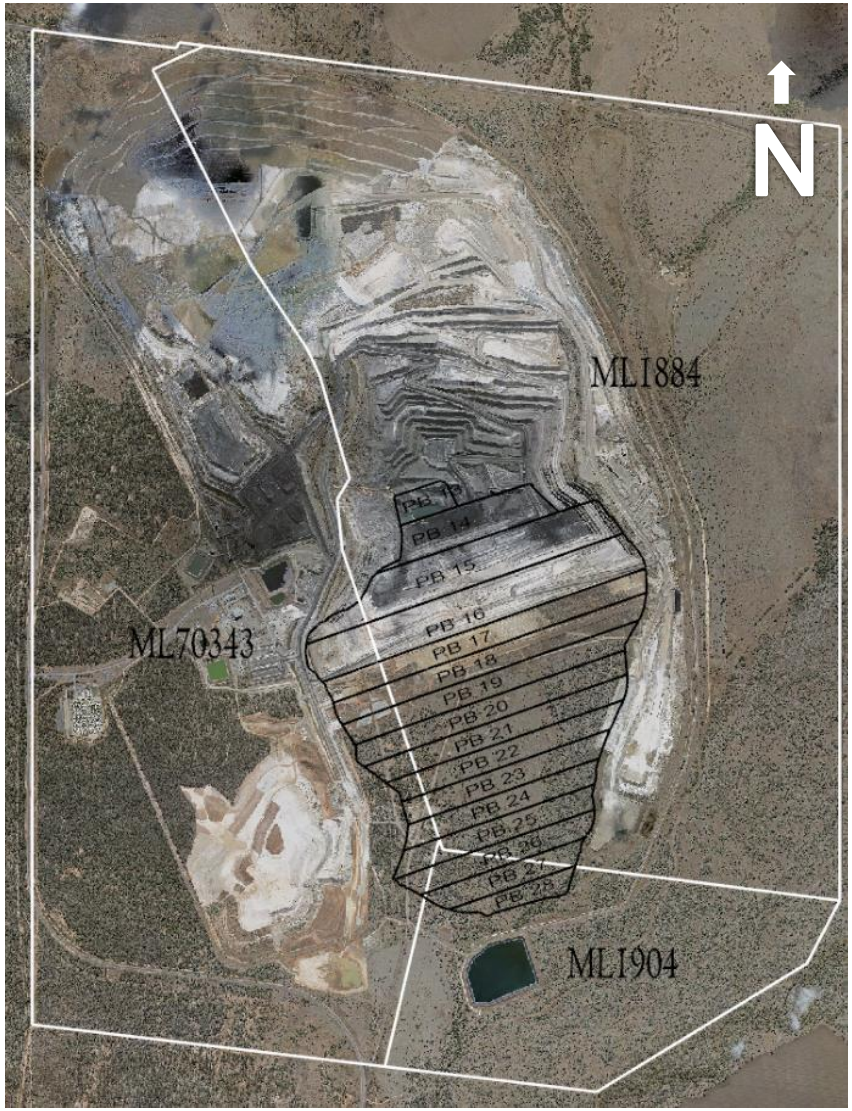
Location

Clermont Coal is a thermal coal mine located in the Wolfang Basin, west of the Bowen Basin some 16 kilometres by road, to the north of the township of Clermont.



Geology

- Wolfang Basin is an elongate, north-south trending lower Permian sedimentary basin, approx 5km long by 1.5km wide.
- Developed on a basement of metamorphics & overlain by tertiary basalt flows & sediments.
- The Strata is truncated on the western side.

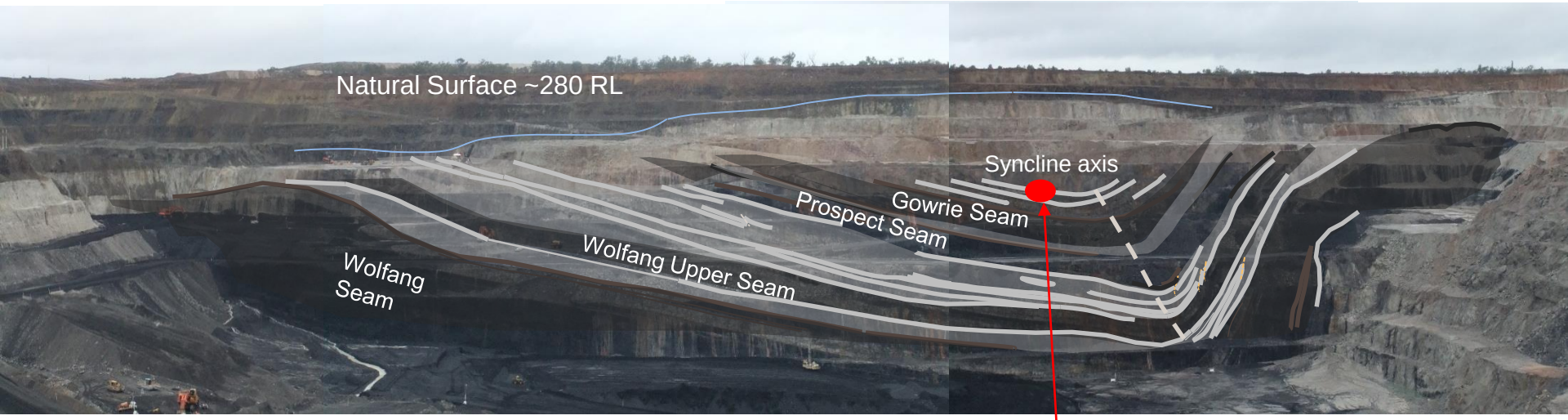


Incident Location

Southern Wall

East

West



Approximate location of incident

Incident Description

Date & Time of Incident:	24 Nov 2017 at 2030 hrs
Location:	Clermont Coal
Incident Summary:	Unplanned initiation of blast hole E2 on pattern P16-158-01T
Persons Injured:	Nil

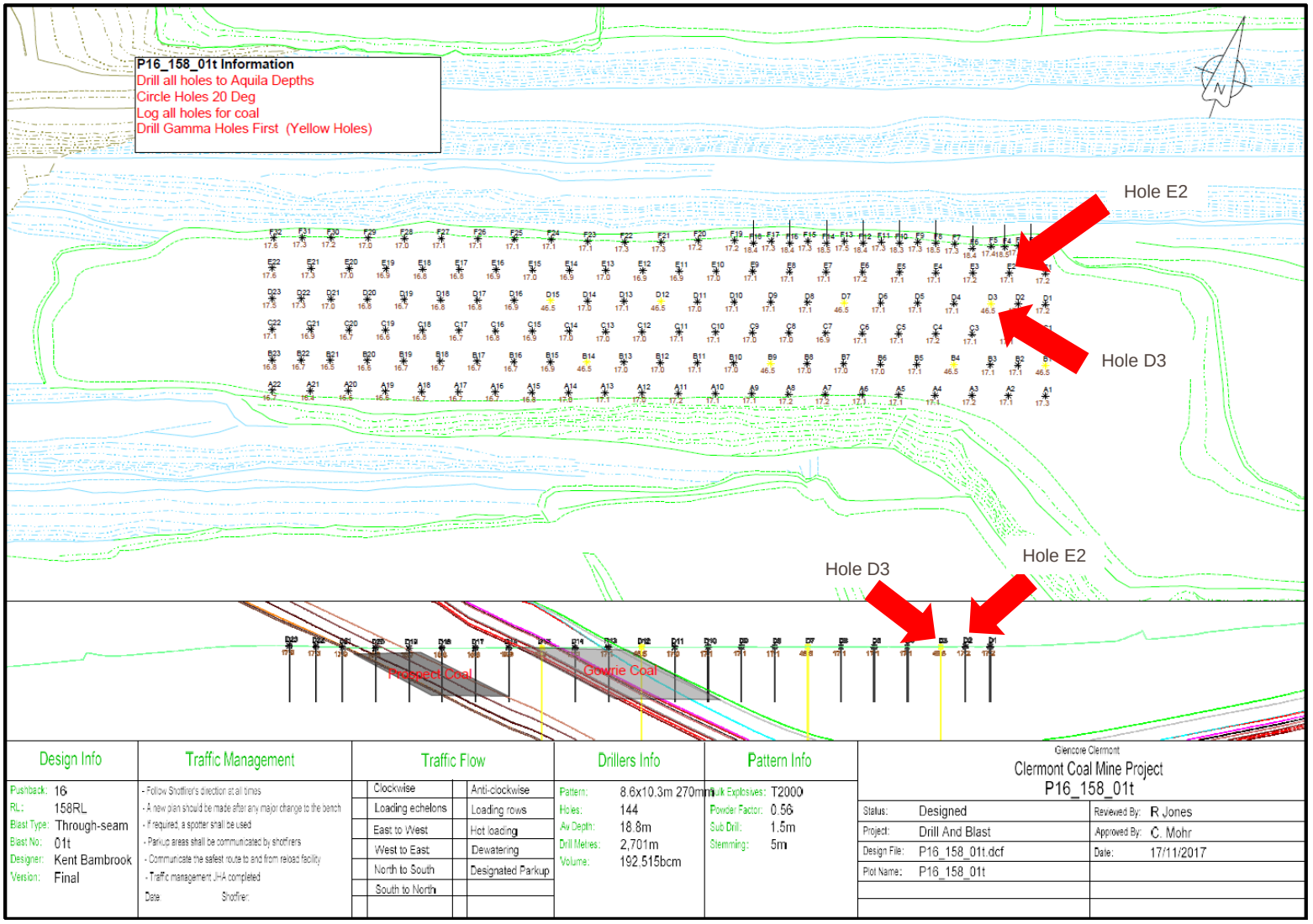
Description:

- On the 24th November 2017 at 8:30pm an unplanned initiation of blast hole No. E2 on pattern P16-158-01T occurred.
- There was no work being undertaken on the blast pattern at the time of the incident, and the initiation was not witnessed by any individuals.
- The exact timing of the initiation is known as it registered on the sites blast noise and vibration monitoring system.
- The incident was discovered during a routine inspection of the area by three supervisors at approximately 11:15pm that evening.
- Emergency procedures were enacted and the investigation team mobilised.

Key Events

1. **17/11/17**
   - Drilling - The first holes drilled were 8 holes to be gamma logged
   - Hole D3 was drilled to a depth of ~54m until it intersected both the smaller upper coal seams in our pit (Gowrie and Prospect seams)
2. **20/11/17**
   - Hole E2 was drilled to a depth of 17m and no coal was intersected
   - Hole D3 was Gamma logged
3. **22/11/17**
   - Hole D3 was backfilled to a depth of ~17m with coal stemming on nightshift
4. **23/11/17**
   - At 1:30pm a Shotfirer performing dewatering duties on the pattern noticed white smoke and a smell coming from near the collar of hole D3.
   - The pattern was evacuated and a watercart used to spray water on the affected area to cool it down.
   - Inspection of the area indicated that there was coal stemming / cuttings and explosive product around the collar of the hole, which had heated and had caused one of the downlines to melt.
5. **24/11/17**
   - Hole D3 was reprimed and stemmed with crushed aggregate
   - At 8:30pm hole E2 self-initiated

Incident Location



Incident Photo – P16 Blast pattern post incident

Incident Photo – P16 Blast pattern post incident

Investigation

The possible scenarios that could have led to the unplanned initiation that were considered and analysed were:

- Spontaneous combustion of coal causing heating of explosive product
- A reaction between either reactive waste or coal and the explosive product
- A reaction between either waste or coal and the explosive product contributed to by the product being the last remaining emulsion from the tanks
- Hot ground causing explosive product to heat
- Movement along a strata plane impacting a detonator
- Spillage of diesel on bench causing increased volatility
- Lightning
- Seismic activity
- “Slap Snap Shoot”
- Sabotage

Investigation Findings – Contributing Factors

1) There was a lack of appreciation for the risk posed by reactive ground

2) Reactive ground test drilling was not completed in a targeted, structured or timely manner – Samples were taken opportunistically as part of sites coal quality / geotechnical drilling program

3) There was no formal process in place at the mine for managing reactive ground

4) Results of reactive ground tests were provided to the explosives supplier yet no feedback was received highlighting any concerns

5) There was no formal process for routine cleaning of emulsion tanks

6) The mine has progressed into an area near the bottom of a syncline where geological conditions may have varied

Key Learnings & Actions

Key Learnings

1) Prior history should not be considered a control and, as such, systems must be adequate to capture changing conditions

2) Conformance with a code of practice does not necessarily control the hazard. Codes should be used as a guide and referenced as a minimum standard.

Actions

1) Sites to demonstrate (or implement) a process of systematic identification and review of the potential for reactive ground, and where identified, that appropriate controls to mitigate the risk are in place

2) Incorporate reactive ground into the technical frame work (TFW) by development of a standard/ protocol and incorporate into associated health checks. The content is to be aligned to meet the intent of the AEISG Code of Practice (Elevated Temp and Reactive Ground) as a minimum.

3) Numerous site actions related to identifying reactive ground areas, sourcing suitable products and updating PHMP / Procedures

Appendix 1 - Reactive ground sampling

- Clermont has been blasting for 10 years without any prior incidents relating to reactive ground

- There is no evidence of any consideration of reactive ground in feasibility studies

- 45 reactive ground tests have been undertaken between 2015 and 2017. These were from a variety of lithology's and depths.

Reactive Ground | MTi Learnings (Common to All Sites)

ISEE Conference | Fremantle November 2018

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Introduction

- The Clermont team did not act differently to the vast majority of mines prior to the event. Their sample collection and testing regime was thought to be acceptable.
- The event and respective testing has shown that closer scrutiny should be given to certain rock types that may have been excluded in the past.
- The following points are suggestions developed by MTi Laboratory Testing Pty Ltd.

Prevention

- Use the AEISG code safety factors as a minimum guideline only
- Undertake a geological risk assessment (risk ranking exercise) – consider outside assistance if understanding of Reactive Ground is lacking on site.
- Test at least the minimum samples for each rock type
- Each year collect and test multiple samples (over and above AEISG)
- Base further sampling on the test results and the risk ranking exercise

Risk Management

Understanding Reactivity Determined by the code

- Ensure that mine geologists have an understanding of the sulphide mineralogy of all rock types on site.
- Use additional test methods to determine sulphide minerology of samples
- Reactivity needs to be understood to obtain an optimal safe and effective blasting solution
- Utilise industry best practice procedures
- Utilise competency based training
- Regularly review/audit competency

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We got a free lesson

Key message –
If your site believes they do not have reactive ground, go and check there is data behind the belief