Dendrobium Colliery

Update on Outburst Issues in the Wongawilli Seam
28-11-07
Aim

• Focus on Wongawilli Seam
• Current status of Dendrobiums gas levels and outburst propensity
• Outburst considerations as the mines move towards deeper and higher gas regimes
• Strategies Forward
Background in the No. 3 Seam

• > 100 years of mining
• Mines close to the escarpment
• Relatively low depth of cover
• Not regarded as “gassy”
• No recorded outburst events
Dendrobium Mine Plan
Dendrobium

- Low gas regime
- Low outburst risk
- Some CO2
- Area 3C first instance of high gas levels
- Don’t have an OBMP – to be reviewed for Area 3a
- Geogas currently reviewing the risk.
Area 3a & 3b Gas Content
Area 3 Gas Composition
Cordeaux Colliery

- Mine withdrew from No. 3 Seam in 1996
- Very limited first workings
- Outburst risk issue was recognised
- Issues raised
  - What is the outburst gas limit
  - Impacts of thick seam and various impermeable layers
  - Drainage effectiveness in No. 3 Seam
- Initial recommendations made and OBMP developed
- Mine Closed prior to resolution
  - Limited opportunity to build the No. 3 Seam data base.
Cx Colliery No. 3 Seam gas core results
Wongawilli Seam Cross Section

Top of Wongawilli Seam

Wongawilli Sandstone Band

Very Weak Claystone Bands

Ironstone Bands

2nd Machine Band

Wonga Parting Clay Band Double Bands

Holing Band

Bottom Band Floor Band

Base of Wongawilli Seam
Variation in Gas Content over Seam Section

• Cx studies into variation in gas content relative to different layers of strata
  • See tables below

• Dendrobium
  • Significant variation in the sample ash levels and the relationship to gas content.
## Ww Sm IN-SITU TOTAL GAS CONTENT

(Corrected to 20 deg. C & 100% coally material)

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<th>Location</th>
<th>Mack. UCx 7</th>
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*Italics indicate uncertain results - adjacent results used.*
Cx – Seam Section Gas Contents

GCx 16 - Total Gas Content (corrected to 100% coaly material)

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m³/tonne (max)
Permeability

• Bulli Seam
  – 1 to 5 milli darcy

• Dendrobium
  – 1 to 5 milli darcy Area 1, 2, 3, 3a, 3b
  – < 1 milli darcy Area 3c
Appin Colliery Outburst TLV
Cx proposed TLV

GAS THRESHOLD LEVELS
Wongawilli seam - Cordeaux colliery
(TVL, Total NTP, @ 20 deg. C, m^3/t)

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Wkg. Roof
Wkg. Sectn.
Geogas – 900 DRI

100% CH4 – 8.2 m³/t
30% CH4 – 6.9 m³/t

Qm Threshold @ 900 DRI
\[ y = 1.846x + 6.3604 \]

Qm Threshold @ 900 DRI less 2 Std Deviations
\[ y = 1.7538x + 5.8527 \]

Wongawilli Seam Gas Content Thresholds
Miscellaneous Items

- Impact of seam structure on outburst risk
  - Well established in the Bulli Seam
- Variability in the seam mineralisation and its impact upon permeability
  - Ie NRE No. 1
- Gas Drainage of the Wongawilli Seam
  - Cx drained readily
  - Appin, WCC – gas flows commence after LW passes
  - Dendrobium – small gas flows only from holes.
Moving Forward

Short Term
- Finalise review of Outburst Risk for Dendrobium
- Establish guidelines for the mine
- Continue to gather data base

Long Term
- Resolve gas sample quality issues (ie factors unique to Wonga Seam).
- Investigate gas reduction techniques
- Gather more samples for Area 3C
- Involve other experts regarding outburst TLV