Gas Management
Oaky North Mine
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Presentation

• Open discussion during the presentation
• Methods of gas management at Oaky North Mine
Methods

- Ventilation practices
- UIS Drainage
- SIS Drainage
- Goaf Drainage
- Envirogen Project
Goaf Drainage

• Reason for operational requirements
  – Access into the Tailgate
  – Prevent gas build up around the tailgate drive
  – Prevent gas trips
Source of the seam gas

- Longwall is full seam extraction
- Aquila seam was mined out by open cut methods
- Tieri 1 and Tieri 2 Rider seam
- Corvus 1 and Corvus 2 Rider seam
Location of goaf wells

- Every 100 metres
- 30 metres from the tailgate roadway
- Wells are drilled and cased for the first 50 metres in the tertiary (200mm)
- They are drilled to 20 metres above the German creek seam
- Detonation Flame arrestors on each riser
Plant specifications

- At open circuit it will pull 1600 L/s
- Rated at 1500 L/s
- Engine CH4 requirements are 16m3/h or 4.44 L/s (50% load)
- Telemetry to the Communication room
- 4 x Gas analysers, CH4, O2, CO, CO2
  - Maihak S715 with calibration cuvettes (autocal)
- UPS back up on analysers + all control
Plant specifications

• Auto/Manual mode
  – Auto normal operating mode will shut down if there is a fault or out of range gases
  – Manual Communication can still see it will bypass the analysers and trips

• Centrifugal fan

• Detonation flame arrester

• Water trap
Operational Parameters

- **Alarm levels**
  - 35% CH4
  - 20% Co2
  - 50ppm CO
  - 5% O2

- **Shut Down**
  - <30% CH4
  - >30% CO2
  - >80ppm CO
  - <8% O2
Gas Engine

• Type of engine is a V10 ford 6.8 litre engine
  – Spark ignition (spark plugs) engine that runs on LPG/Methane

• Starts with LPG then changes over to CH4
  – Runs for 45 seconds on LPG and methane, cut LPG off, if frequency of the alternator drops below 47 Hz turn LPG back on, does this 3 times and will shut down if methane supply is insufficient (Bad)

• Drives a 75 Kw alternator
Goaf Plant

• Has a diesel generator for back up
• Motor driving the fan on the plant is a 37 Kw 2 pole motor (3000 revs)
LPG feed line
Methane feed line
Pressure switch
Solenoids
Pressure switch
LPG feed line
Citect display

• Both the plants can be run at the same time usually we run one at a time.
• During times where the Longwall will pass under a road or creek
Current Methane flow from the Goaf Plant

- Flow rates have ranged between 800 – 1200 L/s at the start of the panels
- As the block retreats the flows drop to around 600 – 800 L/s
Issues with the Goaf Plant

• Methane Generator fuel set up
  – Fluctuations in flow
  – CH4 Concentrations

• Water in the pipe range
  – Pipe range has been buried now it lays on the ground surface
Other gas related Issues

- Flaring of the methane
- Oaky North will be looking at flaring all methane from the
  - SIS risers
  - UIS risers
  - Goaf plant
Flaring

• Why flare
  – Environmentally friendly
  – Reduce green house gas emission
  – Comply with the Mineral Resource Act 1989
Envirogen Project

- A joint project between Oaky No1 and Oaky North to supply the methane to the power station, which will produce 10 – 20 mega watts of electricity requiring 750 – 1500 L/s of methane.
  - Oaky North mine would use around 8 – 10 mega watts

- This project is expected to be operational in June 2006