Barminco

Diesel Emission Management Plan
"Our Journey and recommendation"

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underground mining excellence

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MDEC Conference Toronto

Safety.
Integrity.
Excellence.

Safety first. Safety foremost.






Company history – an established track record of success

In over 25 years, Barminco has grown from a domestic contract miner servicing junior and mid-tier clients, to an underground hard-rock mining specialist servicing some of the world's largest mining companies globally

1995
Awarded first total underground mine services contract and commenced Diamond Drill division.

2007
Gresham Private equity & management investors bought a majority stake of Barminco. Plus the company formed joint venture, AUMS.

May 2013
Successfully refinanced existing debt facilities with a US$485 million senior note offering & secured additional Australian facilities.

December 2014
Named as preferred tenderer for mine development and production at Sirius Resources' Nova nickel project. Also, named as preferred tenderer for the batch plant at the project.

1989 → 1995 → 2003 → 2007 → 2009 → 2011 → 2013 → 2014

1989
Awarded first underground mining contract.

2003
Acquired concrete and crushing business.

2011
Awarded single largest contract in Barminco's history at AngloGold Ashanti Australia's Sunrise Dam gold mine.

2009
Commenced operations at Centamin's Sukari Hill gold mine in Egypt.

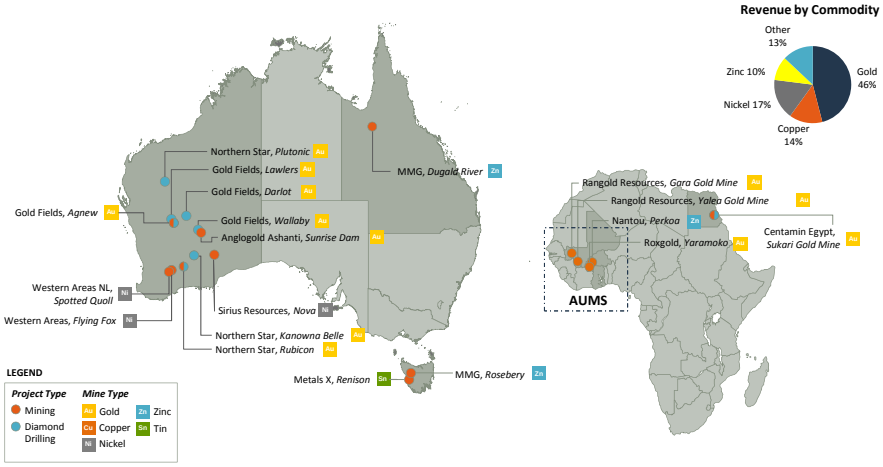
June 2013
Sunrise Dam gold mine recognised as Best Safety Performer in AngloGold Ashanti Gold, registering 940 consecutive days LTI-free.

May 2013
Achieved a world record of 700.4m development metres, with one jumbo, in one month at Dugald River

November 2014
Awarded development works at MMG's Rosebery mine in Tasmania. Barminco now holds the two largest underground mining contracts in Tasmania.

September 2014
Awarded a contract extension at Western Areas' Flying Fox and Spotted Quoll nickel mines in Western Australia.

Operations spanning Australia and Africa



90% of revenue derived from Australia, excluding AUMS

Primary focus of Barminco's strategy

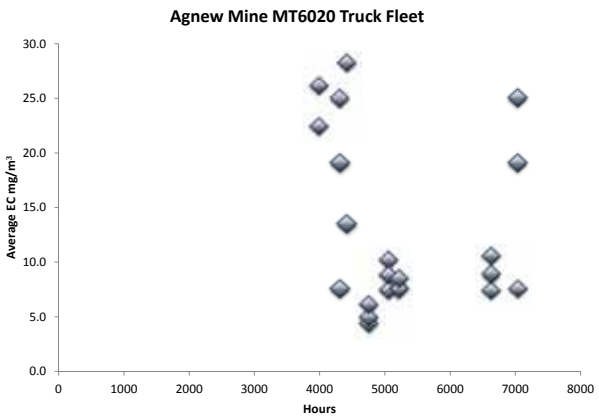
- Minimise workplace employee exposures
- Meet statutory requirements

Guidelines and recommendations

- Management of Diesel Engine Pollutants in underground environments (MDG 29) – New South Wales Department of Primary Industries
- Management of Diesel emissions in Western Australian mining operations – Department of Mines and Petroleum
- Guidance note for management of diesel engine exhaust in metalliferous mines (QGN21) - Queensland
- Environment Protection Authority (EPA) of Tasmania

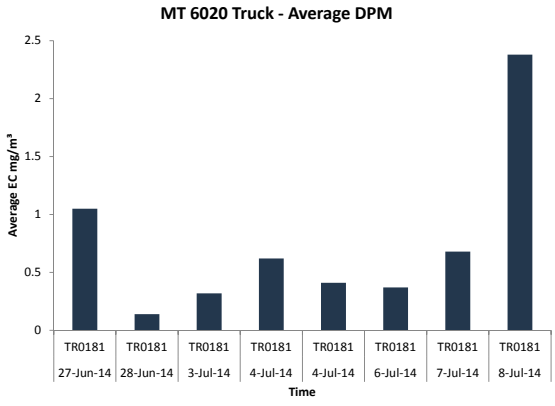
Emission analysis

- Raw exhaust testing using a DustTrak
- Same truck fleet
- Same testing methodology
- @1000 hrs.
- No trend



Project: Dugald River

- Raw exhaust testing using a MAHA MPM
- DPF fitted
- Same testing methodology
- ± 300% variance
- No maintenance intervention
- Inconsistency similar to the DustTrak unit



Accuracy and repeatability

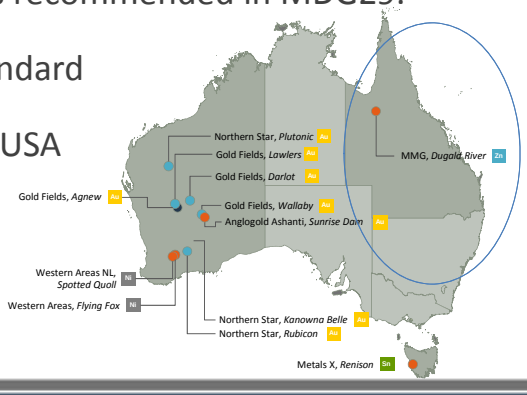
- A solid measurement system requires two sides to be complete:

  repeatability and reliability as well as accuracy and precision

- The Australian MDG29 suggest you establish a baseline then act for a result that is 30% over the base.

Consultant recommendation

- Dugald River management plan uses the 15% and 30% action points as recommended in MDG29.
- NIOSH 5040 test standard
- Sunrise laboratory - USA



What does this mean?

- The emission of a diesel machine does vary significantly over time (hence MDG29 control levels are wrong)

OR

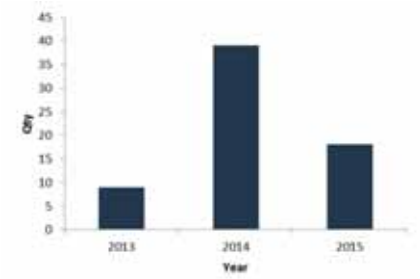
- There is something wrong with our testing methodology.

Our emission management plan

- Continual Improvement Approach
- 95% Upper Confidence Limit (UCL) to determine outlying engines - over the first 6 months (estimated)
- MDG 29 guideline
- Integrate DPM as a preventive maintenance tool

Diesel particulate filter history

- 2010 – approx. 3 for R&D
- 2013 – 9
- 2014 – 39
- 2015 – 18



Total spent to date $2.2 million

Emissions based maintenance - SIX SYSTEMS

1. INTAKE

2. EXHAUST

3. FUEL INJECTION

Emissions based maintenance- SIX SYSTEMS

1. COOLING

2. LUBRICATION

3. Electronic Control Management & CONTROLS

Diesel emissions instruments

ECOM EN2-F

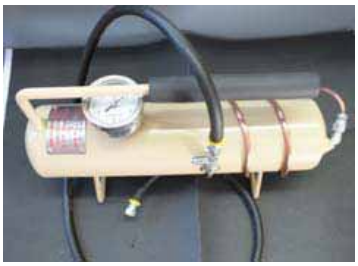
Diesel ChekMate®

Diesel emissions instruments

Diesel ChekMate®

- Sampling and conditioning device
- Mixing and cooling system

DEEM6S



Implementation

- Baseline values
- Target Values (TV)
- Compare test measurements against target values
- Individual emission analysis
- Look for interactions

Servicing of DPFs

- Filtration efficiency
- Backpressure
- Leaks
- Cleaning regime

Documentation

- Standard
- Procedure
- Safe Work Instruction (SWI)
  - Machine modification
  - Back pressure monitoring system
  - Testing equipment methodology
  - Stall test

Regulations - DPM

- Ontario – 0.4 mg/m^3 (NIOSH 5040 TC)
- U.S. MSHA – 0.16 mg/m^3 (NIOSH 5040 TC)
- Western Australia – 0.10 mg/m^3 (NIOSH 5040 EC)
- What is the prediction for the future?

THANK YOU

QUESTIONS