

# FIRES ON MOBILE PLANT

July - September 2019

## Haul truck fire presents extended hazard

### Left to burn

A mine's decision to abandon firefighting has been commended as the risk of burning tyres presented a wide danger zone for an extended time. The decision determined that a 500-metre exclusion zone was required for an extended time when an uncontrolled truck fire was left to burn.

*Figure 1 A haul truck destroyed by fire*



### **Fire suppression reliability concern**

“We think the fire system didn’t work as well as it should have. I hit the fire button three times. I didn’t set off a big pop like in the training. I turned the truck off by key and hit E Stop”.

“We didn’t see any powder from fire suppression system.”

These concerns were reinforced by similar comments emerging from a dozer fire (IncNot0035751) where the operator reported: “I had to hit the actuator three times but couldn’t get it to work.”

Aftermarket and original equipment manufacturer (OEM) installed fire suppression systems should integrate effectively into the design of the vehicle, taking into account the duties of a designer to carry out analysis, testing and examination. Ergonomic design must be considered where a significant strike of the fire suppression actuation mechanism is required.

Mobile plant must be rigorously assessed in relation to the risk of fire, including consideration of the flammability of non-metallic components, the toxic products of combustion, location of flammable components relative to heat sources, fire suppression systems and the location of hand-held extinguishers. A fire risk assessment should include an assessment of material quantities, flammability characteristics, and in the event of a fire, the heat release rate and toxicity of products of combustion.

### **Second underground coal fire as loose drive shaft damages hydraulic hoses**

A shield hauler was driving in an underground coal mine, when a bearing failed on the universal joint connecting the drive shaft from the engine to the torque converter, at the torque converter end. The drive shaft was not restrained by safety loops. Before the engine could be shut down, the drive shaft spinning at engine speed made contact with components, hydraulic and pneumatic lines, which resulted in a spray of hydraulic fluid and compressed air that ignited.

Read our [Safety Bulletin – Drive shaft failures causing fires](#).

### **Maintenance work a contributing factor**

Investigation of several fires has identified maintenance work as a contributing factor to initiating the fires. Stringent monitoring and quality control of maintenance and repair activities must be undertaken to prevent fires on mobile plant. Sufficient time and resourcing must also be allocated to maintenance and repair tasks.

## **NSW bushfires claim mining vehicles**

An unattended crane ignited when a bushfire burned close to a NSW quarry. Fire events may cause damage and operational losses, as well as threaten the health and safety of people at mines and petroleum sites. The safety of the public may also be at risk from fires at mine sites. The fire may spread beyond the mine boundaries, with bushfire and harmful smoke threatening communities.

Bushfires near, or on, mining operations may threaten surface infrastructure such as mine ventilation fans, office buildings and worker facilities, power supply lines and structures, handling and processing plants, rail and other ancillary supply infrastructure.

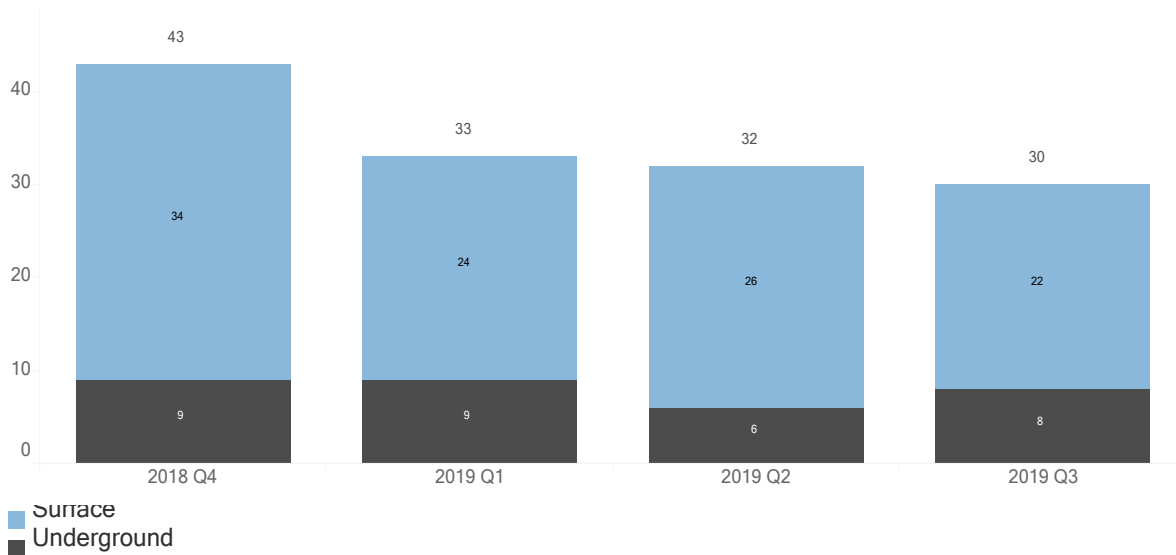
Bushfires may also impact mine access and exit for workers and emergency services personnel, mobile plant, stored flammable and combustible products such as coal stockpiles, chemicals and explosives, and even coal seams in pit and where they outcrop on the surface.

Mine and petroleum site operators must ensure that their safety management system (SMS) and emergency plan can be used to respond to foreseeable emergency situations caused by fires.

## Statistical data

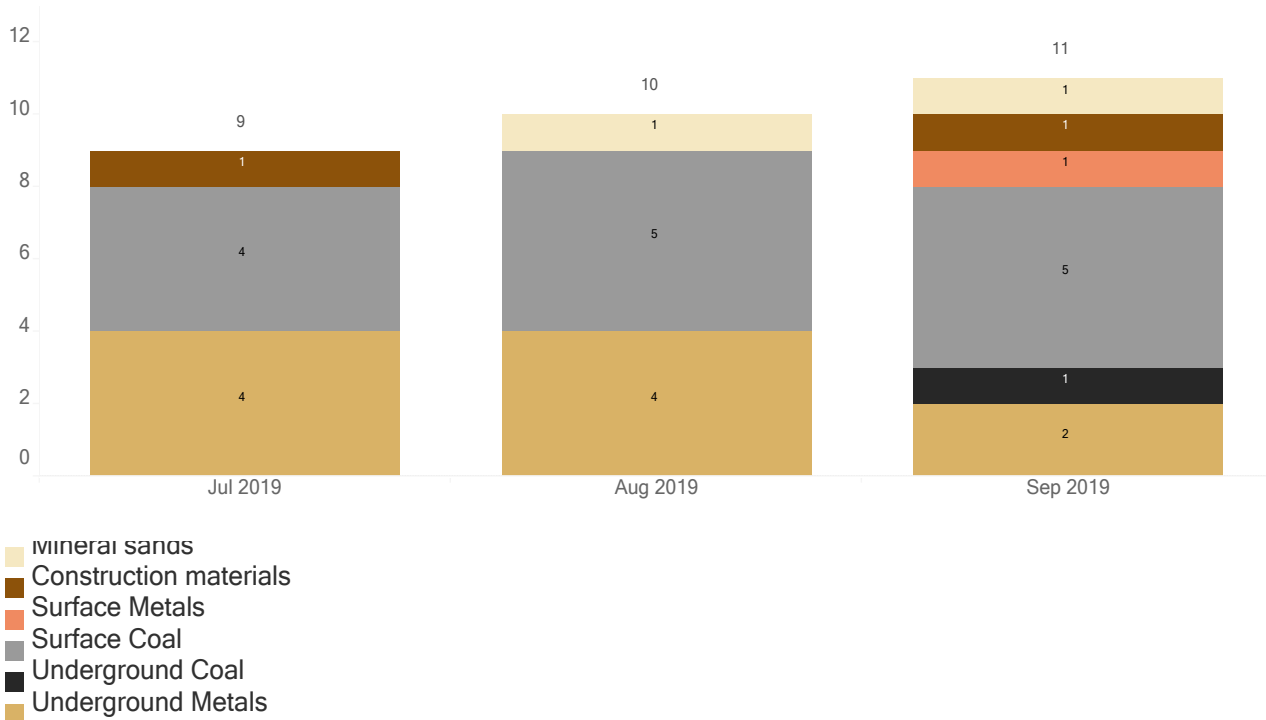
### Incident notifications by primary location – October 2018 to September 2019

Figure 2 Fires on mobile plant by surface or underground location



### Incident notifications by mine type, operation type and month – July 2019 to September 2019

Figure 3 Fires on mobile plant for Quarter 3 2019, sorted by depth layers



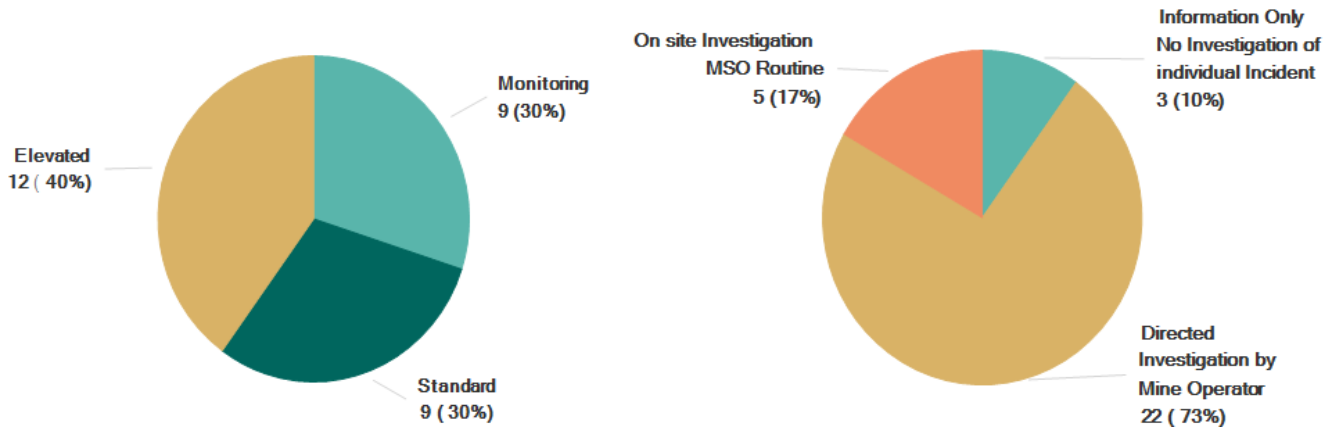
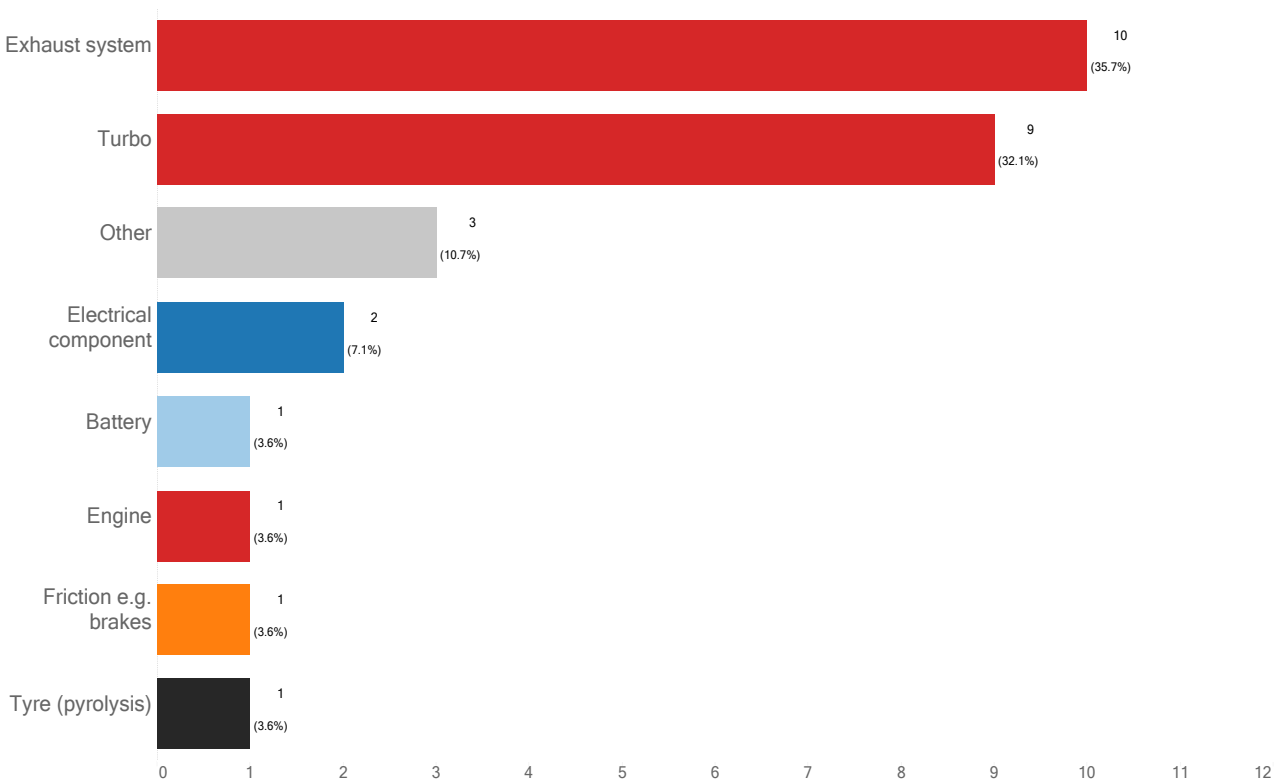
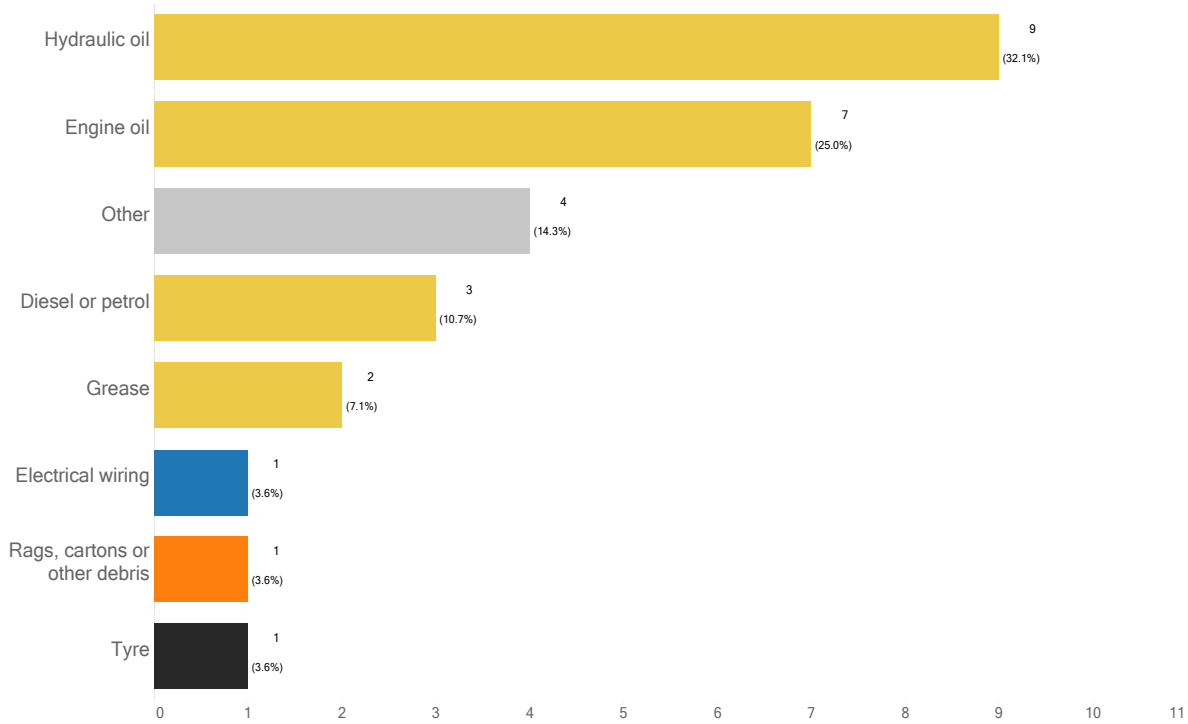


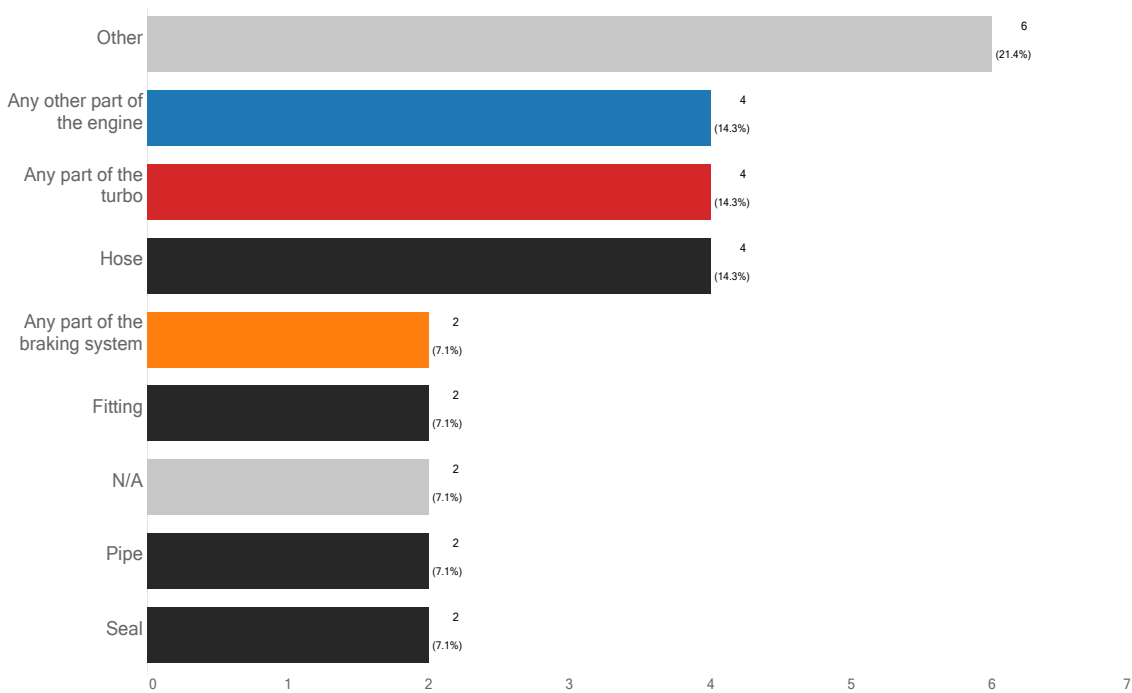
Figure 4 Heat sources as determined by ancillary reports Quarter 3 2019



*Figure 5 Fuel sources as determined by ancillary reports Quarter 3 2019*



*Figure 6 Failed components as determined by ancillary reports Quarter 3 2019*



## **Safety incident log (July to September 2019)**

### **July 2019 - Rix's Creek IncNot0035097**

A fuel injector plunger failure on number 16 cylinder, allowing unburnt fuel to combine with oxygen on the hot surface of the outside of the exhaust manifold. It was due to a pre-existing exhaust manifold leak on the same cylinder.

*Figure 7 Rix's Creek incident*



### **July 2019 - Potosi Operations IncNot0035084**

A truck was refuelling at the fuel bay at the surface of the mine. Fuel splashed out of the breather and ignited when it contacted hot engine parts. The refuelling system was a dry break system.

*Figure 8 Potosi Operations incident*



### **July 2019 – Peak Gold Mine IncNot00355117**

An operator noticed smoke after repairs were undertaken. Dried residual coolant fluid was exposed to a heat source.

*Figure 9 Peak Gold Mine incident*





### **July 2019 – Bengalla IncNot0035122**

An investigation found that a brake fluid leak occurred on a water cart at the brake manifold fitting on the line to the brake valve, from an O-ring failure. It was most likely caused by inadequate bolt tensioning during brake valve replacement.

*Figure 10 Bengalla incident*



### **July 2019 – CSA Mine IncNot0035124**

A fire was caused by a short circuit of a lighting circuit on the boom of a loader. Wiring loom was damaged as a result of rock deposited in the pivot point.

*Figure 11 CSA incident*





## July 2019 – Potosi Operations IncNot0035139

Diesel fuel was found to be leaking from the back of an outer fuel feed pipe. The sealing grommet on the outer pipe was not present at the time of the incident. The event occurred after major engine maintenance was carried out.

*Figure 12 Potosi Operations incident*



## July 2019 - Boggabri Coal excavator IncNot0035187

A filter housing failed due to debris and fatigue in the restraining clamp, causing oil to spray onto a turbo.

*Figure 13 Boggabri incident*



**July 2019 - Austen Quarry Hartley IncNot0035184**

Hydraulic fluid was released from a hydraulic hose and made contact with a hot exhaust.

*Figure 14 Austen Quarry Hartley incident*



**July 2019 – Tarrawonga IncNot0035210**

An electrical fire occurred on an excavator. The electrical harness rubbed through and caught fire.

*Figure 15 Tarrawonga incident*



### August 2019 - Wambo Open Cut IncNot0035249

The turbo failed internally and the fire was largely contained inside the engine exhaust pipe.

*Figure 16 Wambo Open Cut incident*



### August 2019 - Cadia East Project IncNot0035260

Fire in the exhaust system of a loader. Based on the evidence gathered during the tear down inspection on LD062, the most probable root cause of the failure was a section of turbine wheel fractured away during operation at the welded joint, between the turbine wheel and main shaft.

*Figure 17 and 19 Cadia East incident*







### August 2019 – Boggabri IncNot0035298

An electrical fitter failed to reconnect a conductor to the grid box blower motor No 1 after removing it during repairs.

*Figure 18 Boggabri incident*



### August 2019 - Crayfish Mineral Sands Mine IncNot0035296

Brakes appear to have locked on a 777D truck, resulting in a fire.

*Figure 19 Crayfish Mineral Sands Mine incident*



## August 2019 - Ravensworth Operations Inc Not0035303

The operator identified smoke in his rear vision mirror and saw flames emanating from the engine bay deck. The left-hand side turbo oil feed line was dislodged from the turbo fitting.

Figure 20 Ravensworth incident



## August 2019 - Perilya North mine Inc Not0035336

Guarding over a pulley system cracked, allowing guarding to make contact with batteries and battery wiring.

Figure 21 Perilya North incident



## August 2019 – Mt Arthur IncNot0035352

A turbo fire has occurred on an unloaded rigid dump truck that was returning to the dump. The operator noticed the truck losing power. Workers then noticed excessive smoke coming from the exhaust, so they pulled over on the haul road. They heard a loud noise and noticed flames coming from the exhaust of the truck.

Figure 22 Mt Arthur incident



## August 2019 - Moolarben Open Cut IncNot0035448

An unprotected hydraulic hose came into contact with the fire wall. The hose rubbed through, releasing an oil mist that hit the hot exhaust and ignited.

Figure 23 Moolarben Open Cut incident



## August 2019 - Northparkes Mines IncNot0035440

The preliminary findings revealed overfilled hydraulic oil. Oil flowed over hot component hydraulic oil tank breather, allowing overflow oil to drain into the engine.



*Figure 24 Northparkes Mines incident*



### **August 2019 - Highland Quarries Guyra IncNot0035536**

There was no apparent cause other than an air filter catching fire.

*Figure 25 Highland Quarries incident*



### **September 2019 - Peak Gold Mines Cobar IncNot0035497**

An O-ring in a hose/valve block arrangement for the radiator pump assembly failed and caused a mist of hydraulic fluid to be sprayed on coat hot engine components, which had not been tightened correctly after repairs were carried out.



Figure 26 Peak Gold Mines incident



### September 2019 - Ulan West IncNot0035517

A Caterpillar heavy haulage load haul dump machine (LHD) was towing a feeder breaker into the mine on a sled when a uni-joint on the tailshaft catastrophically failed. The tailshaft damaged hydraulic hoses within the engine bay, resulting in a fire.

Figure 27 Ulan West incident



### September 2019 - Mt Owen IncNot0035537

A loose fastener on a valve bank caused an O-ring to fail, releasing a spray of atomised oil. The atomised oil ignited when it came into contact with a hot surface.

Figure 28 Mt Owen incident



### September 2019 - Rasp Mine IncNot0035538

A loader was bogging in Level 11 on the Far North Stockpile when the loader operator noticed oil spraying from the rear of the machine and saw flames within the engine compartment. The fire was caused by a failed hydraulic hose, causing oil to spray onto hot engine components.

Figure 29 Rasp Mine incident



### September 2019 - Ravensworth IncNot0035580

An unattended mobile crane caught on fire after a scrub fire came through the mine. The NSW fire brigade and the mine's emergency response team extinguished the fire.



Figure 30 Ravensworth incident



## September 2019 - Cowal Gold Mine IncNot0035643

A haul truck was travelling up a ramp when it experienced a turbo fire. The operator could not operate the fire suppression system. There was a water truck travelling behind the haul truck. The fire suppression actuator pin was unable to be pulled out due to an additional safety tag on the pin. The location of the fire suppression actuator made it difficult to remove the pin.

Figure 31 Cowal Gold Mine incident



## September 2019 - Crayfish Mineral Sands IncNot0035664

The integrity of a tyre failed, causing separation between the tread and the tyre belt. The tyre carcass sustained some damage with some bead wire's integrity damaged.

*Figure 32 Crayfish Minerals Sands incident*



## **September 2019 - Moolarben Open Cut IncNot0035720**

Air ingress to the secondary suction bellows allowed a fan pump to suck air into a circuit, causing the cavitation of the hydraulic pump. The cavitation caused the fan circuit steel lines to pulsate rapidly, leading to the fatigue cracking in the steel pipe.

*Figure 33 Moolarben Open Cut incident*



## **September 2019 - Glendell Open Cut IncNot0035679**

The root cause of the uncontrolled fire was determined to be the failure of a high pressure hoist supply hose, between the main pump and the high pressure screen. As a result, hydraulic oil ignited at the furthest extent of the exhaust system. The hydraulic hose failed due to poor routing and restraint.

Figure 34 Glendell Open Cut incident



### **September 2019 – Hunter Valley Operations IncNot0035685**

A fire occurred on a Komatsu 830 truck at 341 shovel. Fully ablaze, the area was barricaded and the truck was left to burn. An operator applied the fire suppression system and left the truck. No injuries were reported. One tyre exploded. It was observed that the fitting on the balance hose between fuel rails had separated from the hose. The fire occurred the day after the balance fuel hose was replaced. Considering when the fire occurred, it was considered likely that there was some factor of the hose replacement that resulted in the hose fire.



Figure 35 and 38 HVO incident and after fire extinguished



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