



**NSW
Resources
Regulator**

INVESTIGATION REPORT

MAULES CREEK MINE TRUCK COLLISION

Maules Creek Mine 21 April 2018

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (August 2019). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Planning, Industry and Environment or the user's independent advisor.

Executive summary

Incident overview

About 8am on 21 April 2018, a service truck operator suffered serious injuries when the service truck he was driving collided with a haul truck at a four-way intersection at the Maules Creek Mine. The operator of the haul truck was not physically injured.

The intersection road signs were changed during the day shift the day before the incident, to allow haul trucks to drive straight through the intersection from the mine's production area. To give effect to this change, the intersection's stop signs were relocated to the eastern haul road, requiring traffic travelling east and west to stop and give way to other traffic.

At the time of the incident, the service truck was travelling east. The haul truck was fully loaded and travelling north.

The service truck driver was unaware that the stop signs at the intersection had been changed the previous day. So, he believed he had the right of way. As he neared the intersection, he saw an ultra-class haul truck approaching the intersection on his right. He assumed the haul truck would stop at the intersection. He did not see a relocated stop sign on his left, as he approached the intersection. He noticed that the haul truck appeared to be speeding up rather than slowing down.

The haul truck driver was aware of the change to the intersection signs as he had driven through the intersection earlier that morning. He understood that he had right of way.

As the two vehicles entered the intersection, both drivers realised a collision was imminent and attempted to take evasive action. The 100-tonne service truck collided with the side of the 500-tonne haul truck, resulting in catastrophic damage to the service truck. The haul truck stopped about 100 metres past the impact point.

An emergency response was activated. The service truck driver suffered back, shoulder and wrist injuries. He was transported by helicopter to hospital, where he received medical treatment.

Causal factors

The NSW Resources Regulator's investigation into the incident identified the following causal factors:

- The mine operator did not risk assess the change to the intersection signs.
- The mine operator did not consult with workers about the proposed changes.
- The mine operator did not clearly communicate the intersection change to all road users.

Following the incident, the mine operator:

- Improved its pre-start presentation pack to include intersection changes.
- Improved its risk assessment process for intersection changes.
- Implemented a process which requires an engineering review to be conducted when changes to intersections are proposed.

Industry recommendations

It is recommended that mine operators:

- Conduct detailed risk assessments when major changes are made to mine roads.
- Consult with workers about changes to mine roads.
- Communicate all road changes to all workers.
- Ensure traffic control signs are adequate, sufficiently visible and appropriately placed.
- Install appropriate warning signs or barriers to inform road users of changes.

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1. Purpose of the report

The report has been published under section 70(1)(b) of the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* to share safety learnings about the incident and prevent similar incidents from occurring.

2. Investigation overview

2.1. Major Investigations Unit

The Major Investigations Unit (MIU) investigates serious workplace incidents in the NSW mining, petroleum and extractives industries. The unit's role is to carry out a detailed analysis of significant incidents and report its findings to enhance industry safety and to give effect to the NSW Resources Regulator's Compliance and Enforcement Policy.

2.2. Authority to investigate

MIU investigators have the authority to investigate this matter as the incident occurred at a mining workplace. The investigation was conducted under the *Work Health and Safety Act 2011* (WHS Act) and the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* (WHSMA).

MIU investigators are appointed as government officials under the WHSMA and are deemed to be an inspector for the purposes of the WHS Act. The Regulator has also delegated some additional functions to investigators, including exercising the power to obtain information and documents for the purposes of monitoring compliance with the WHS Act.

2.3. Regulator's response to the incident

Upon notification of the incident, the Regulator's mine safety inspectors attended the mine on Saturday 21 April 2018. The incident scene was secured and an initial scene assessment was conducted.

Investigators attended the incident scene and commenced a formal investigation on Monday 23 April 2018.

The investigation sought to determine:

- the cause and circumstances of the incident
- whether the mine operator, workers and others complied with their obligations under the WHS Act and Regulations, and

- how similar incidents of this nature can be prevented in the future.

2.4. Investigation information release

On 7 May 2018, the Regulator published an [investigation information release](#) about the incident to share early investigation learnings with the mining industry.

Figure 1 Damaged front end of service truck



2.5. The mine

The Maules Creek Mine is situated at Therribri Road, Maules Creek, about 15 kilometres northeast of Boggabri, NSW.

Maules Creek Mine is an open cut coal mine that produces thermal and metallurgical coals. Overburden and coal are mined by truck and excavator. Coal is transported by rail to Newcastle for export.

Maules Creek Mine operates 12.5 hour shifts 24 hours a day, seven days a week.

The Maules Creek Mine is on Coal Lease CL375, Mining Lease ML1701 and ML1719.

2.6. The mine operator

The nominated operator for Maules Creek Mine is Maules Creek Coal Pty Ltd, a subsidiary of Whitehaven Coal Limited (WCL).

Maules Creek Coal Pty Ltd has the same registered office as WCL, being Level 28, 259 George Street Sydney, NSW 2000.

Mine operators have a duty to identify hazards and manage risks to health and safety associated with roads and the movement of plant in accordance with the *Work Health and Safety Act 2011* and *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and Regulations.

3. The incident

About 8am on 21 April 2018, a service truck operator suffered serious injuries when the service truck he was driving collided with a haul truck at a four-way intersection at the Maules Creek Mine. The operator of the haul truck was not physically injured.

The intersection road signs were changed during the day shift the day before the incident, to allow haul trucks to drive straight through the intersection from the mine's production area. To give effect to this change, the intersection's stop signs were relocated to the eastern haul road requiring traffic travelling east and west to stop and give way to other traffic.

At the time of the incident, the service truck was travelling east. The haul truck was fully loaded and travelling north.

The service truck driver was unaware that the stop signs at the intersection had been changed the previous day. So, he believed he had the right of way. As he neared the intersection, he saw an ultra-class haul truck approaching the intersection on his right. He assumed the haul truck would stop at the intersection. He did not see a relocated stop sign on his left, as he approached the intersection. He noticed that the haul truck appeared to be speeding up rather than slowing down.

The haul truck driver was aware of the change to the intersection signs as he had driven through the intersection earlier that morning. He understood that he had right of way.

As the two vehicles entered the intersection, both drivers realised a collision was imminent and attempted to take evasive action. The 100-tonne service truck collided with the side of the 500-tonne haul truck, resulting in catastrophic damage to the service truck. The haul truck stopped about 100 metres past the impact point.

An emergency response was activated. The service truck driver suffered back, shoulder and wrist injuries. He was transported by helicopter to hospital where he received medical treatment.

The final location of both vehicles immediately after the incident is shown in figure 2.

Figure 2 Four-way haul road intersection showing trucks involved in the collision



The Caterpillar 773D service truck was used to transport diesel and refuel mobile and fixed plant at the mine. It was a rigid framed vehicle and had a gross vehicle weight of 103 tonnes.

The Hitachi EH 5000 haul truck was used to haul coal and overburden. It was a large rigid-framed truck with a payload of 296 tonnes and gross vehicle weight of 500 tonnes.

3.1. The day before the incident

Prestart meetings

On the morning of 20 April 2018, the oncoming day shift supervisor met with the nightshift supervisor. They conducted a pre-shift inspection of the mine, where they discussed issues that had arisen on the preceding night shift and actions to be undertaken on the following day shift. This was the normal practice of the mine.

Both supervisors discussed the change of dump that was to occur. 'Dump' is the area where the mined, broken, overburden rock from above the coal seam was taken and dumped by haul trucks. The change of dump meant haul trucks were running to dump 3370, as dump 3360 was full.

This change in dump required a change in the route that the haul trucks would follow. The change in the route required haul trucks to proceed straight ahead at the intersection instead of turning right. The haul trucks would return via the same route.

The dayshift supervisor told his crew at the pre-shift meeting of the change of dump and informed them that he would be changing the stop signs at the main intersection leading to the dumps. This was to be completed as soon as he could, once the shift was underway.

Change of location of the stop signs at intersection

The dayshift supervisor made the decision to change the stop sign to give the right of way to loaded trucks going up the 300-metre ramp and empty trucks coming down the ramp. He confirmed that he had spoken to his manager before making the change. There was no formal risk assessment conducted.

The supervisor relocated the stop signs at the intersection about 8am on 20 April 2018 and then made the call over the mine's two-way radio system at 8.10am about the change.

Communication

The supervisor used the mine's two-way radio system to inform the drill and blast crew about the signage change at the intersection. He had intended to contact the maintenance crew but was interrupted by a call and subsequently did not contact them to advise them of the change.

The service truck operator

On 20 April 2018, the service truck operator worked day shift. The service truck operator said the intersection change was not discussed at the pre-shift meeting he attended.

The service truck operator told investigators that when he drove through the intersection that morning, the stop signs were still in their original position and he did not return to that part of the mine again that day.

3.2. The day of the incident

Maintenance prestart meeting

At 6.30am on 21 April 2018, pre-shift communications meetings were conducted with the maintenance crew. The service truck operator attended the pre-start meeting and began his shift from the workshop muster area. The intersection change of the preceding day was not communicated to the maintenance crew at the pre-start meeting.

Production pre-start meeting

At 6.30am on 21 April 2018, the haul truck operator began his shift at the production muster room by attending a pre-start meeting. The changes to the intersection were not discussed and he was unaware of the changes before starting operation of the haul truck. The haul truck operator first became aware of the change when he drove through the intersection that morning and noticed that the stop signs had been relocated.

3.3. Incident circumstances

The service truck operator

The service truck driver was unaware that the stop signs at the intersection had been changed. The service truck operator's job was to drive the service truck around the mine and refuel, grease and top up oils, hydraulic fluids on the site machinery. The service truck operator was in and out of the vehicle on a regular basis for periods of up to 20 minutes for each service stop.

On starting his tasks, the service truck operator followed his regular routine before making his way across the mine, toward the intersection. About 100 metres from the intersection, he saw the haul truck approaching on his right. At first, he thought the haul truck was slowing down so he returned his attention straight ahead to look where he was going. As he got closer to the intersection, he realised that the haul truck was speeding up and had run the stop sign. At this point the service truck operator braked and took evasive action.

Haul truck operator

The haul truck operator first became aware of the change to the stop signs when he approached the intersection for the first time at 7.10am on the morning of the incident. He noticed that the stop signs had been relocated and he had the right of way when travelling to dump 3370.

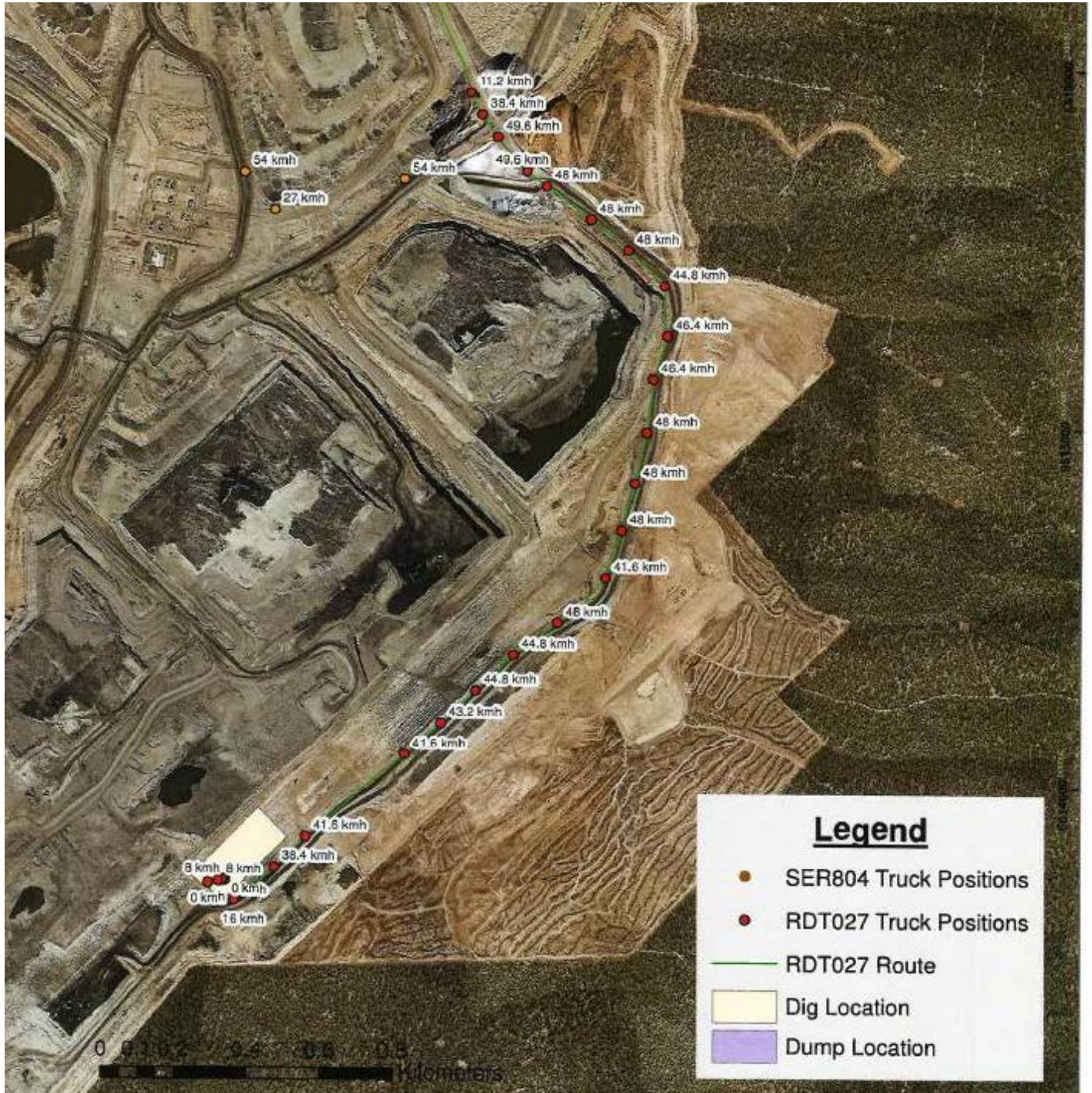
The haul truck operator told investigators that the windrows were high and impeded his view as he approached the intersection. The service truck suddenly appeared at the last minute to his left. He tried to accelerate in an attempt to avoid the collision, however the service truck collided with the rear of his truck, pushing his truck toward the median strip.

Speed of heavy vehicles

In the plan below, the movements of the haul truck are shown with the red dots and the movements of the service truck with brown dots. The tracking of the haul truck was quite constant, whereas the positioning of the service truck was infrequent and random.

The haul truck was travelling at 48.6 km/h at time of impact and the service truck was travelling at 54 km/h toward the intersection. According to the mine's safety management system, the maximum speed limit in the mine was 60 km/h. It appears that both vehicles were travelling at speeds that would indicate that they were not intending to slow or stop at the intersection. However, the speed of both trucks at the time of the collision is not known as both operators attempted to take evasive action immediately before the collision.

Figure 3 Maules Creek Coal Mine haul truck RDT027 and service truck SER804 speed tracking



4. Safety management system

At the time of the incident, Maules Creek Mine had implemented a safety management system (SMS) pursuant to clause 13 of the WHS (MPS) Regulation.

Relevant documents of the SMS include, but are not limited to, Maules Creek, Principal Mining Hazard Management Plan, Roads and Other Vehicle Operating Areas, Whitehaven Coal Standard Risk Management, Maules Creek, Coal Standard of Construction of Intersections and Whitehaven Coal, Standard Management of Change.

4.1. Risk assessment

Whitehaven Coal Standard Risk Management (WCSRM) set out when, how and what type of risk assessment was required at Maules Creek Mine.

Section 3.1 of the WCSRM identifies triggers for when risk assessments are required. Changing work practices, procedures or making changes to the physical work environment is identified as a trigger for a risk assessment.

The supervisor did not undertake a risk assessment and did not document the process other than to record that he had made the change in the open cut examiner's (OCE) inspection book and on the whiteboard in the OCE's office.

Section 3.2 of the WCSRM outlines a risk framework that requires consultation, communication and provision of information to the workers as part of that framework.

The supervisor did not consult with any of the workers who used the intersection. He informed and sought confirmation from his manager about the change. After he had made the change, he communicated the change over the two-way radio on the general mining channel and the drill and blast channel but did not communicate with the maintenance crew.

No physical barriers or warning signage was installed on the roadways leading to the intersection to alert road users to the changed conditions.

5. Causal factors

The Regulator's investigation into the incident identified the following causal factors:

- The mine operator did not risk assess the change to the intersection signs.
- The mine operator did not consult with workers about the proposed changes.
- The mine operator did not clearly communicate the intersection change to all road users.

6. Foreseeability

The risk of vehicle collisions at intersections at large open cut mines, with high volume traffic movements, is well understood by the mining industry.

The investigation identified that several incidents involving near misses had been reported to the mine operator prior to this incident. An examination of those incidents identified several near misses involving heavy vehicles at intersections at the mine.

The following incidents are of note:

- **17 March 2018** - near miss between two 500-tonne trucks; while travelling to the dump 345, haul truck 11 pulled onto the haul road at the ramp intersection in front of haul truck 33.
- **9 April 2018** – the operator of haul truck 34 approached the RL360 dump looking at tip head and not watching haul truck 11 leave the tip head, ran into the rear of haul truck 11 at slow speed.
- **11 March 2018** - a haul truck accelerated away from a stop sign in front of a light vehicle.
- **6 March 2018** – the operator of haul truck 27 was required to brake when haul truck 9 did not give way at a stop sign. Haul truck 9 was returning to the pit after refuelling.

7. Remedial action

Following the incident, the mine operator:

- improved its pre-start presentation pack to include intersection changes
- improved its risk assessment process for intersection changes
- implemented a process which requires an engineering review to be conducted when changes to intersections are proposed.

Notably, the mine operator also introduced new warning signs to identify changes to intersections.

The mine's construction of intersections procedure was updated to include the following:

"In addition, when right of way through an established intersection is changed, signage shall be erected on all relevant roads to indicate a change to the upcoming intersection. Signage is to be a "Changed Traffic Conditions" sign, mounted on a tyre or sled. Through traffic is to have 1 sign at approx. 50 m from the changed intersection. Traffic with a stop sign is to have 2 signs (1 on each side of the carriageway) within 20 m from the changed intersection and 1 sign at approx. 50 m from the changed intersection. The "Changed Traffic Conditions" signs are to be used for a minimum of 10 days."

8. Recommendations

It is recommended that mine operators:

- conduct detailed risk assessments when major changes are made to mine roads
- consult with workers about changes to mine roads
- communicate all road changes to all workers
- ensure traffic control signs are adequate, sufficiently visible and appropriately placed
- install appropriate warning signs or barriers to inform road users of changes.