NSW GOVERNMENT

NSW Resources Regulator

Quarterly safety report

OCTOBER TO DECEMBER 2019

ABOUT THIS REPORT

This quarterly health and safety performance report has been prepared by the NSW Resources Regulator for mining operators in NSW. It contains industry and sector specific information, in addition to information regarding hazards. Wherever possible, trends and patterns have been identified.

The report references sector information about the number of 'active' mines. Active mines have the status: open, intermittent, mines under care and maintenance, open tourist mines, planned and small-scale titles that are current or pending.

The report also contains information on matters of concern to the NSW Resources Regulator including controls and actions that may be implemented to prevent or reduce the likelihood of future safety incidents.

Operators should use the sector specific information, emerging issues and good practice examples presented in this report to assist them in improving safety management systems and undertaking risk assessments at their sites.

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NSW GOVERNMENT

Quarterly snapshot

The quarterly safety performance snapshots show key measures and assist industry in the development and promotion of safe work practices on mining operations.

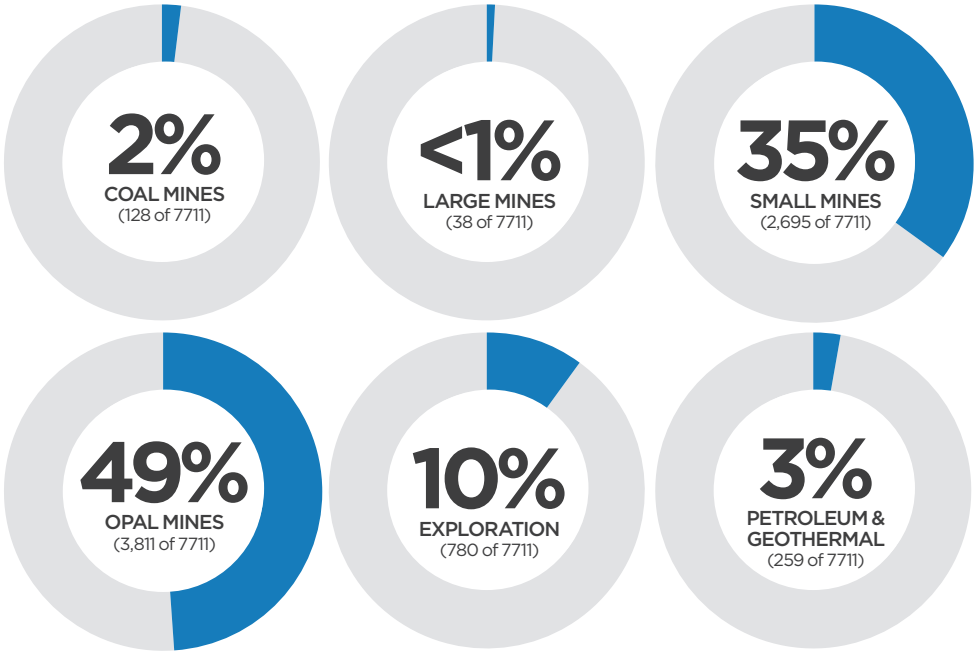
Active mining sectors

7,711

Total active mines (OCT - DEC 2019)

Active mines include open, intermittent, mines under care and maintenance, open tourist mines, planned and small-scale titles.

Mining sector breakdown

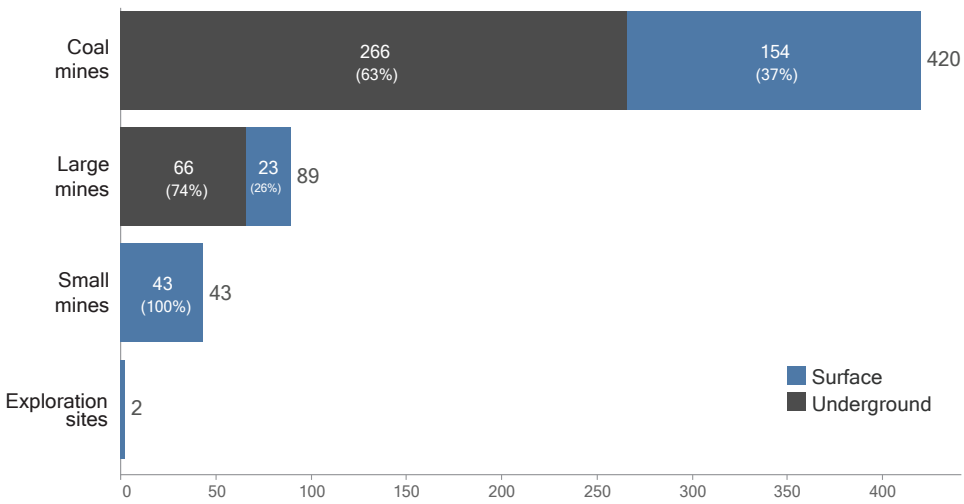


Safety notices issued by sector

- FROM 152 **146** COAL
- FROM 130 **116** LARGE MINES
- FROM 179 **130** SMALL MINES
- FROM 53 **33** OPAL MINES

Incident notifications received by sector

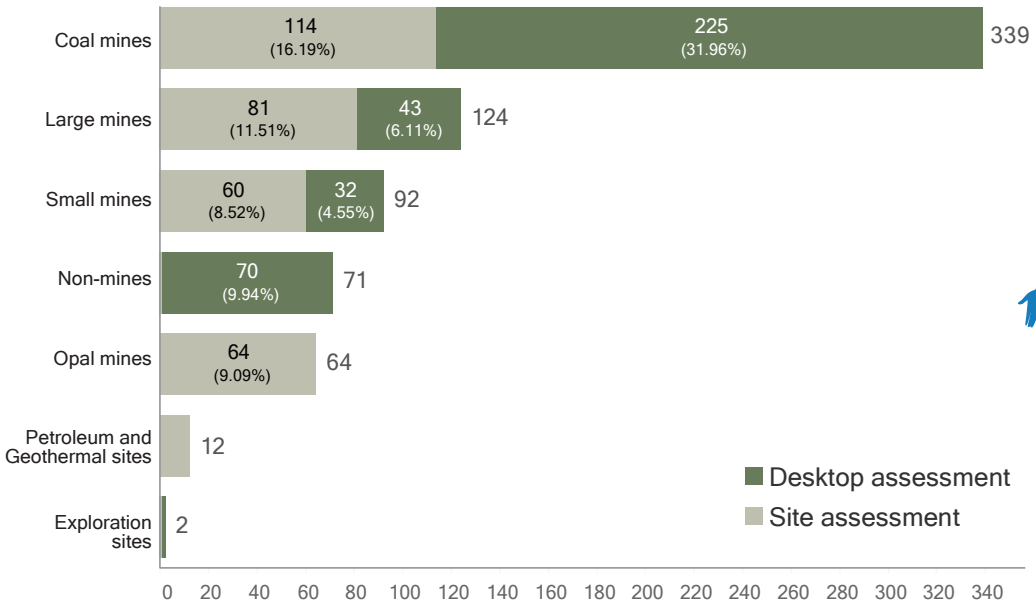
- FROM 444 **420** COAL
- **89** FROM 83 LARGE MINES
- **43** FROM 32 SMALL MINES
- **2** FROM 0 EXPLORATION SITES



Quarterly snapshot

NSW Resources Regulator

Safety assessment commenced by sector



Injuries reported

FROM 23
22
SERIOUS INJURY

FROM 42
34
MEDICAL TREATMENT INJURY

Incidents by type

FROM 170
135
WORK ENVIRONMENTS

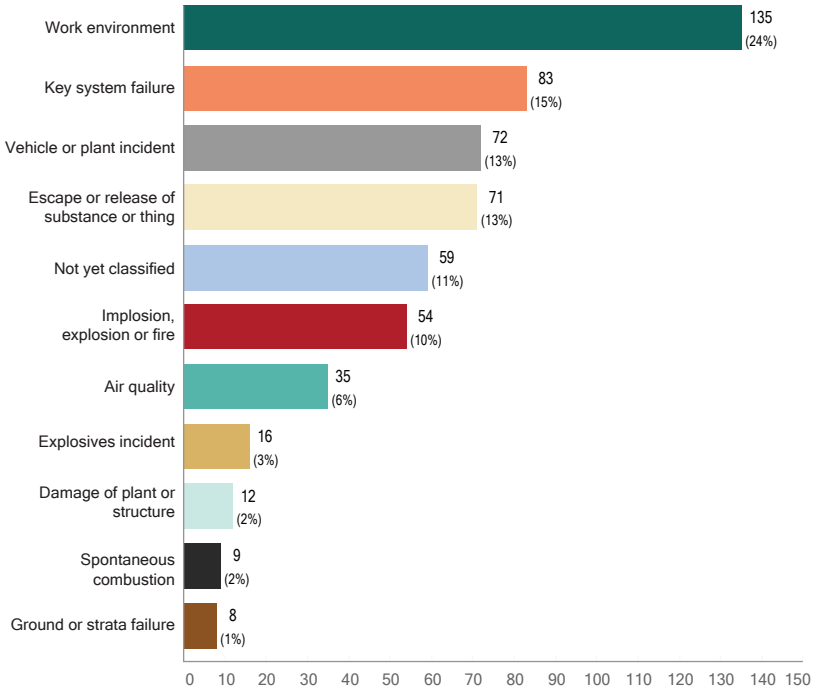
FROM 94
72
VEHICLE OR PLANT INCIDENT

54
FROM 39
IMPLOSION, EXPLOSION OR FIRE

83
FROM 61
KEY SYSTEM FAILURE

71
FROM 39
ESCAPE OR RELEASE OF SUBSTANCE OR THING

FROM 37
35
AIR QUALITY



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Contents

Executive Summary

This report is prepared to assist mine and petroleum site operators to meet their obligations under relevant work health and safety legislation, including the *Work Health and Safety (Mines and Petroleum Sites) Act 2013*. It is also a way in which we monitor progress in implementing our risk-based compliance and enforcement strategy.

As a high-hazard regulator, we focus on compliance with legislative requirements associated with the principal hazards and other high-risk hazards including mechanical and electrical energy and explosives.

As well as providing an overview of incidents across the mining industry, this report looks at the safety performance and regulatory activities of six sectors: coal, large (non-coal) mines and quarries, small mines and quarries (including gemstones), opal mines, petroleum and geothermal sites, and exploration sites.

This report provides information on significant mining events in Australia and globally, summarises safety incident notifications, compliance activities and outcomes for the current quarter, that is quarter two in the financial year 2019-20 (FY 2020 Q2). This report covers a 15-month period from October 2018 to December 2019 for selected measures.

There were two fatalities at mines in NSW during the quarter. Ongoing investigations will determine whether these were work-related deaths.

In the current quarter, we received 554 safety incident notifications. This represents an increase of 3% compared to the same period a year before. However, all sector incident rates (notified incidents per active mine) have remained stable during the past 15 months. Most safety incident notifications received in the current quarter (67%) relate to high potential incidents. A further 22% relate to dangerous incidents. A clear majority of safety incident notifications received in the quarter (76%; 420 of 554) were from coal mines.

Of the 554 safety incidents notifications received in the current quarter (FY 2020 Q2), about 24% related to work environment, 15% to a key system failure and 13% were related vehicle or plant incidents.

We completed 704 safety assessments during the current quarter. Almost half of these (339 of 704) were undertaken in the coal sector, which shows that the coal sector continues to be a priority for our safety assessments program.

We conducted, on average, 339 proactive assessments (activities not related to incidents and complaints) each quarter during the past five quarters which represents approximately 43%, on average, of all assessments. For the same period, on average, 304 site assessments (activities conducted on site) were conducted each quarter which represents approximately 76%, on average, of all assessments.

For the current quarter, 53 targeted assessment programs were conducted. This represents over a 300% increase from last quarter. Teams of inspectors of various disciplines focused on the hazards of 'fatigue', 'dams, tailings, emplacements', 'inundation or inrush (of any substance)' and 'roads or other vehicle operating areas.' These targeted assessment programs were conducted across the coal, large mines, and small mines sectors, and encompassed both open cut and underground operations.

We completed 197 planned inspections, each focusing on a specific hazard at a mine site. In the coal sector, the focus was on the hazard 'fire and explosion' and 'explosion suppression.' For the large mines and quarries sector, planned inspections focused on 'roads or other vehicle operating areas' and in the small mines and quarries sector the hazard focus was on 'structural integrity' and 'air quality or dust'. These targeted assessments follow a pre-prepared plan focusing on a specific hazard including principal control plans.

There were 431 safety notices issued across all sectors in NSW during the current quarter. Of these notices, 58% (251 of 431) were improvement notices and 12% (50 of 431) were prohibition notices. This equates to an average of one prohibition notice issued for about every five improvement notices.

The number of safety notices issued during the five quarters does vary but has reduced since the previous quarter. However, this still represents a significant increase of 32% when compared to the same quarter from financial year 2018-2019 (326 in the same quarter previous year, 431 in the current quarter).

During the quarter we focused on the following safety issues:

- risks associated with fire and explosion, particularly in the large mine and quarries sector
- risks associated with roads or other vehicle operating areas on mine sites
- air quality and worker exposures to airborne contaminants and dust hazards
- integrity of tailings dams and emplacements.

National and international significant events

The NSW Resources Regulator is committed to sharing safety information about significant mining related events and fatalities to increase industry awareness about mine safety and regulatory matters.

This list includes fatalities and significant events that occurred between **October to December 2019**. It is not exhaustive.

Incidents have been selected based on their relevance to equipment and processes commonly used across the NSW mining industry.

Australia

Fatal injuries

NEW SOUTH WALES

There were two fatalities recorded this quarter in the NSW mining industry.

- At around 10am on Monday 14 October a worker was reportedly found unconscious and unresponsive in the cabin of the excavator he was operating. NSW ambulance attended the scene but were unable to revive the worker.

  An investigation has determined that the death was not work-related. See Information release.
- At around 10 am on Friday 15 November a worker was reportedly found unconscious and unresponsive in the cabin of the rubber tyred dozer he was operating. NSW ambulance attended the scene but were unable to revive the worker.

  An investigation has commenced to determine whether the death was work-related. No further information is available currently. See Information release.

OTHER STATES

Queensland

There was one fatal injury reported in this quarter.

- On 25 November 2019 a coal mine worker was fatally injured when coal fell from a long wall face. The coal mine worker was recovered by emergency responders and was unable to be resuscitated. Queensland Mines Inspectorate's investigation into the incident is ongoing. See Information release.

Western Australia

There were no fatal injuries reported in this quarter.

Dangerous incidents

NEW SOUTH WALES

For this quarter, seven dangerous incidents of note were published as safety bulletins on the Resources Regulator's website.

TABLE 1. NSW RESOURCES REGULATOR SAFETY ALERTS AND BULLETINS

DATE PUBLISHED	REFERENCE	TITLE
03 Oct 2019	SB19-10	Dozer incidents increase despite warnings
04 Nov 2019	SB19-11	Drive shaft failures cause fires
04 Nov 2019	SB19-12	Spontaneous combustion of conveyor rubber
07 Nov 2019	SB19-13	Workers injured while installing conveyor boot ends
07 Nov 2019	SB19-14	Conveyor pulley failures initiate fires
07 Nov 2019	SB19-15	Rapid face bolter incidents
22 Nov 2019	SB19-16	Gemstone hoist rope

OTHER STATES

Queensland

In this quarter, two dangerous incidents were published in Queensland:

- Two sub-contractors on a petroleum lease were using high-pressure water jetting equipment on a combination vacuum recycling truck to clean a separator on a well. One worker received serious facial injuries when impacted by high-pressure water during the process. See Petroleum and gas safety alert no.95.
- An explosives charge vehicle containing explosives, caught fire while at a charged face. See Mines safety alert no.369.

New Zealand

Dangerous incidents

In New Zealand, five dangerous incidents were published in this quarter:

- A worker was washing down a dump truck at a wash pad when the truck experienced a rupture of the rear left-hand tyre involving the inside sidewall and bead. See Safety Alert.
- A worker was using a grinder on the edge of a steel bar when the grinder kicked back at him. His overalls became entangled with the tool around waist height. This caused a tiny abrasion to his stomach area. First aid treatment was applied. No further medical assistance was required. See Safety Alert.
- Two fitters were fitting a 3-tonne front axle assembly onto a loader. A spreader bar was used to allow the correct placement of the two slings on each end of the axle. Once centred, the axle was being lifted off the cribbage when the west side sling dropped. The spreader bar flung around and landed on top of the loader bucket and the axle dropped onto the cribbing and then slid off onto the floor. See Safety Alert.
- A worker slipped from a conveyor frame while performing a screen change and fell approximately 2m, contacting guarding and a steel frame (used for hanging hoses) during the fall. The worker sustained a fractured rib and bruising. See Safety Alert.
- A labour hire worker was trying to shut the bin door over a crusher from the walkway. He had trouble and called for help from the contract engineer via the RT. The contract engineer climbed over the handrail and stood on the brackets supporting the chute and straddled the chute to access the lever to close the bin door. The crusher was operating at the time. See Safety Alert.

United States of America

Fatal injuries

In this quarter, the following six fatal injuries occurred in the United States of America's mining sector:

- On 5 September 2019, a continuous mining machine helper was fatally injured when he was struck by a battery-powered scoop. The victim was in the #3 entry behind a wing curtain that provided ventilation to the #3 right crosscut that was being mined. A scoop, carrying roof bolting supplies, was trammed through the #3 left crosscut, and struck the victim as it made a right-hand turn and passed through the wing curtain. See Fatality Alert.

- On 17 September 2019, a 40-yearold electrician with nine years of total mining experience, died when he contacted an energized 995 VAC component. The victim was performing electrical work on the scrubber motor circuit of a continuous mining machine (CMM). The accident occurred because electrical work was performed on an energized electrical circuit while the circuit was not locked and tagged out. See Fatality Alert.
- On 5 November 2019, a 51-year-old mobile mechanic with 15 years of mining experience, died on while operating his service truck. it veered off the road, struck a berm, and ejected him as it overturned. See Fatality Alert.
- On 16 November 2019, an owner operator of a Limestone operation, with 50 years total work experience, died after a bulldozer struck him. While spotting for a haul truck, the victim stepped backwards into the path of the bulldozer that was backing up. See Fatality Alert.
- On 3 December 2019, a contractor was servicing an Alimak elevator on the fourth level of a pre-heater tower. The contractor was on top of the elevator and another mine employee was inside the elevator assisting. The person inside the elevator heard a clicking sound and the elevator started a downward descent. The contractor on top of the elevator received crushing injuries when the elevator moved. See Fatality Alert.
- On 23 December 2019, a miner was fatally injured while attempting to remove a splice pin from a 72-inch main line conveyor belt splice. The victim was positioned between the bottom conveyor belt and the frame of the tail piece. A belt clamp and come-a-long failed, allowing the bottom belt to release stored energy, causing the belt to shift upward and pin the victim against the frame of the belt tail piece. See Fatality Alert.

Compliance and enforcement

We use a range of tools to promote and secure compliance in mines in relation to the relevant work health and safety legislation. These range from desktop assessments to site inspections and investigations, and enforcement actions including issuing notices and commencing prosecutions.

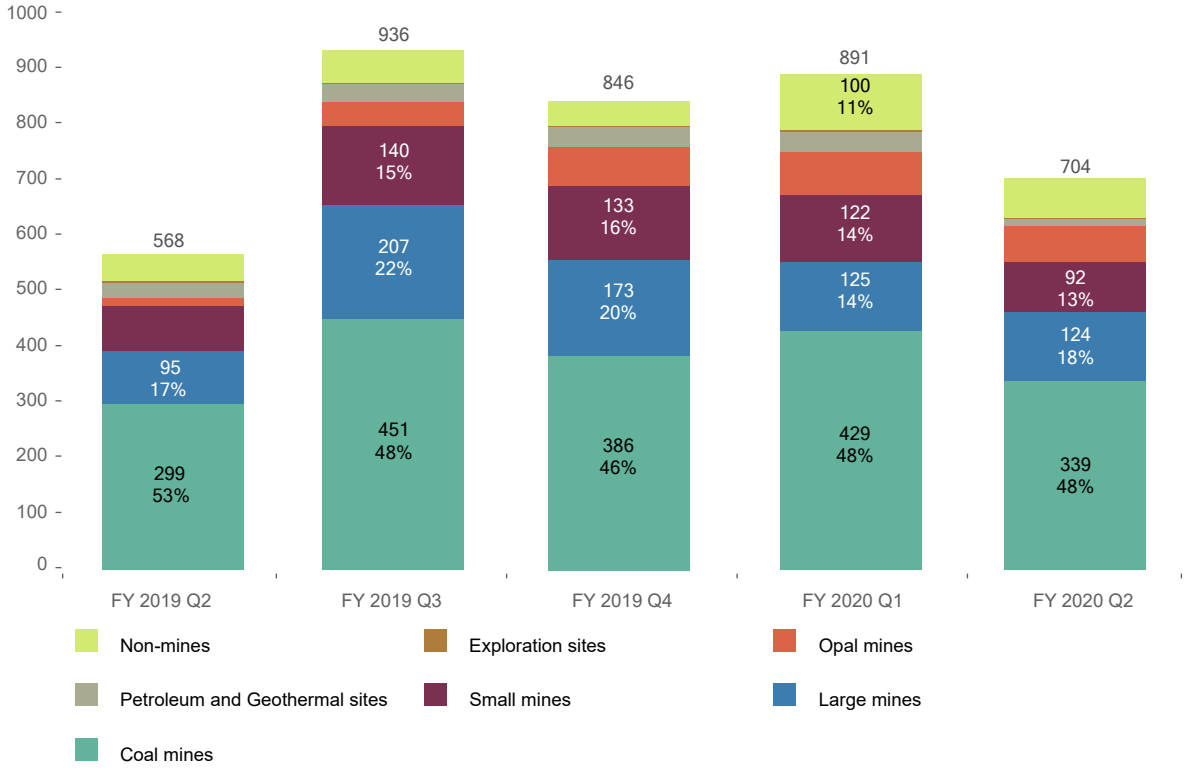
Detailed information regarding compliance activities, priorities, outcomes and reports are published on our website and in our monthly business activity reports.

Safety assessments by sector

The total number of safety assessments we undertook during the past 15 months is shown below, by mining sector.

The graph below shows that the coal sector continues to be a priority for our safety assessment programs, accounting, on average, for over 48% of safety assessments, during the previous five quarters.

FIGURE 1. SAFETY ASSESSMENTS BY SECTOR OCTOBER 2018 TO DECEMBER 2019



Safety assessments by category and nature

The focus of our onsite compliance activity is on preventing incidents through planned, risk-based interventions (proactive).

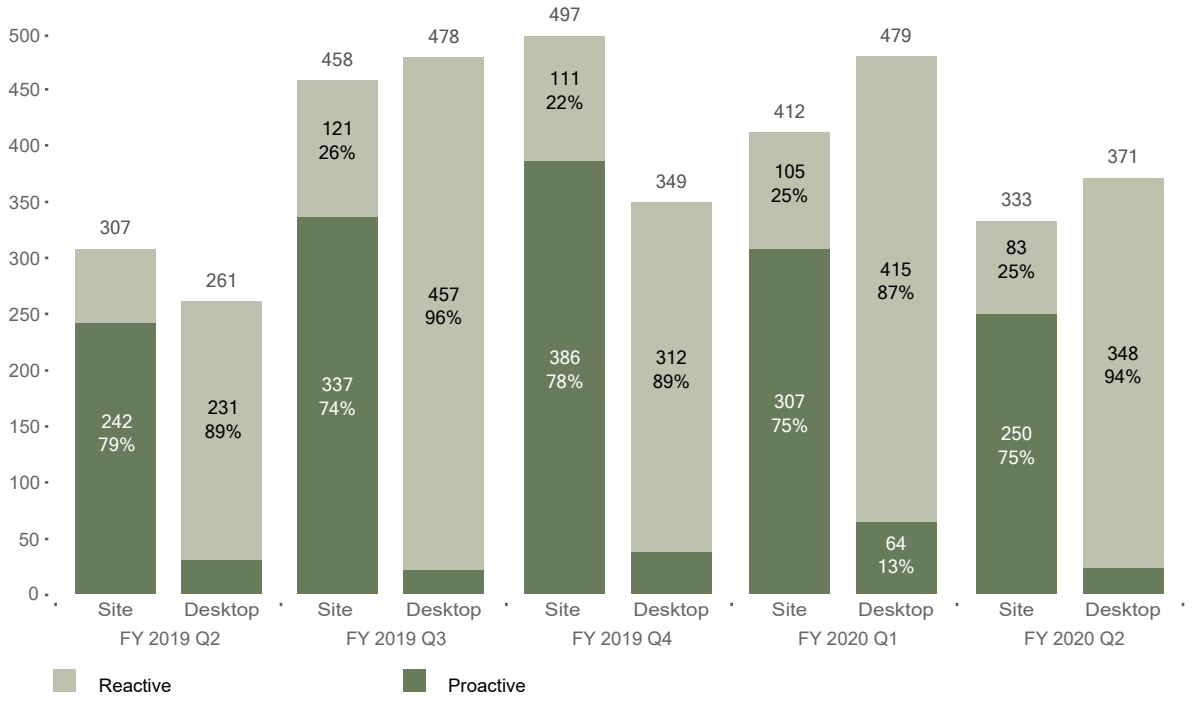
Site-based (visiting mine sites) and desktop activities are both important regulatory tools.

Desktop assessment activities include reviews of control measures following an incident, review of standing dust committee reports, assessment of high-risk activity notifications, applications for exemptions from work health and safety laws, subsidence management plans and preparation for site work.

Proactive onsite assessments focus on establishing whether critical controls have been effectively implemented.

The graph below shows the proportion of site-based and desktop activities undertaken for proactive and reactive safety assessments, for each quarter since October 2018. In the past 15 months, on average, 76% of our site-based activities were proactively focused on incident prevention.

FIGURE 2. ASSESSMENTS BY CATEGORY AND NATURE OCTOBER 2018 TO DECEMBER 2019

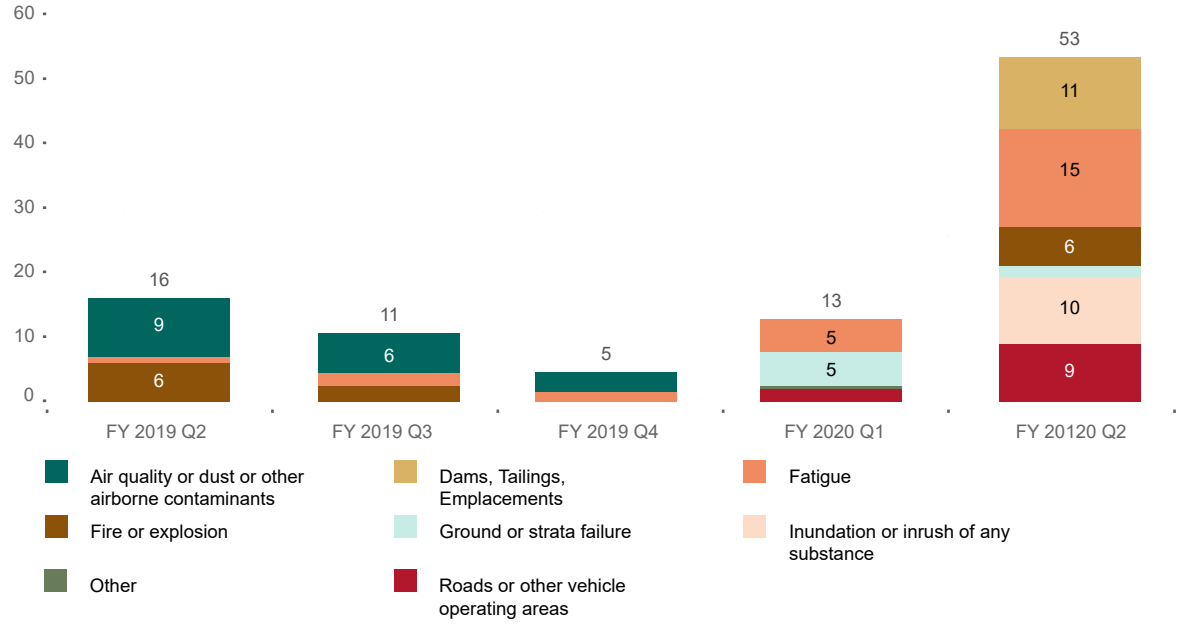


Targeted assessment program

Our targeted assessment program (TAPs) establishes a risk-based and proactive approach for assessing the extent to which critical controls for managing principal mining hazards have been implemented. Each TAP is performed by a team of inspectors from various disciplines. The team works with the mining operation's management team to ensure a thorough assessment is conducted.

In the current quarter, 53 TAPs were conducted.

FIGURE 3. TARGETED ASSESSMENT PROGRAMS BY HAZARD OCTOBER 2018 TO DECEMBER 2019

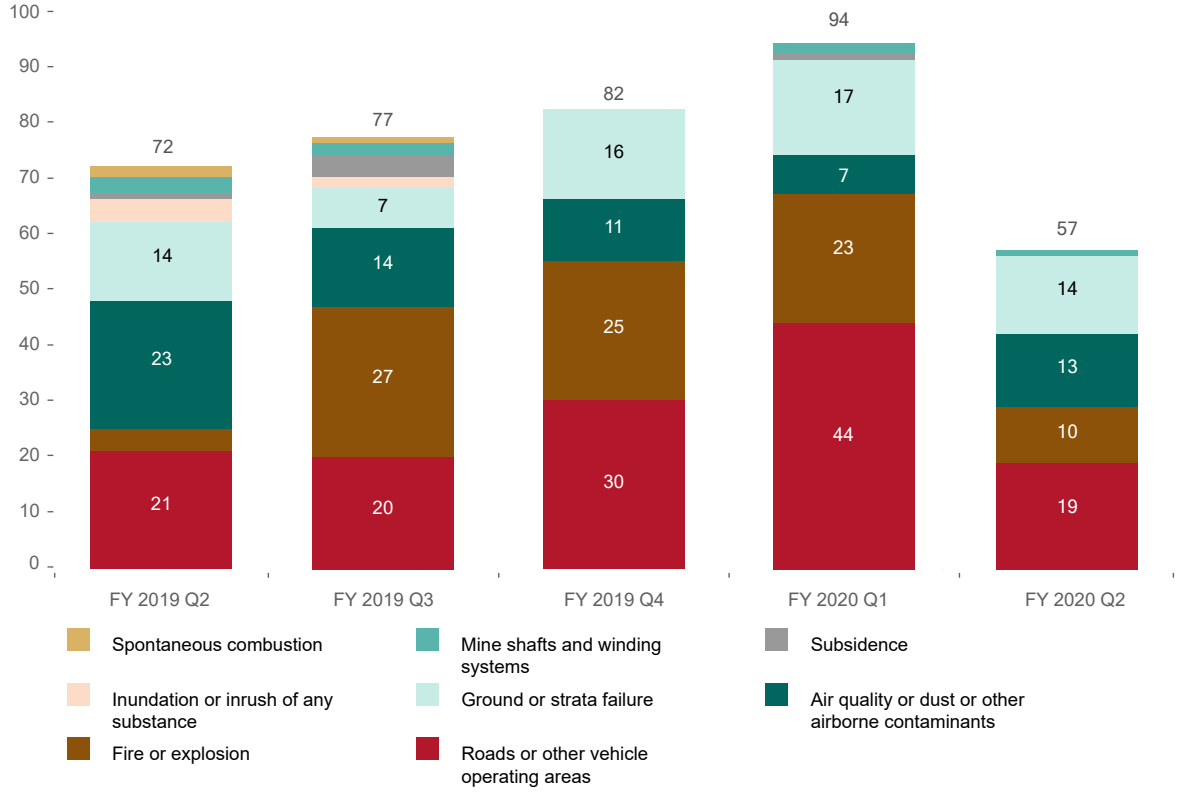


Planned inspections

Planned inspections assist in identifying compliance weaknesses which could lead to an incident or injury. These inspections follow a pre-prepared plan focusing on a specific hazard or principal control plans.

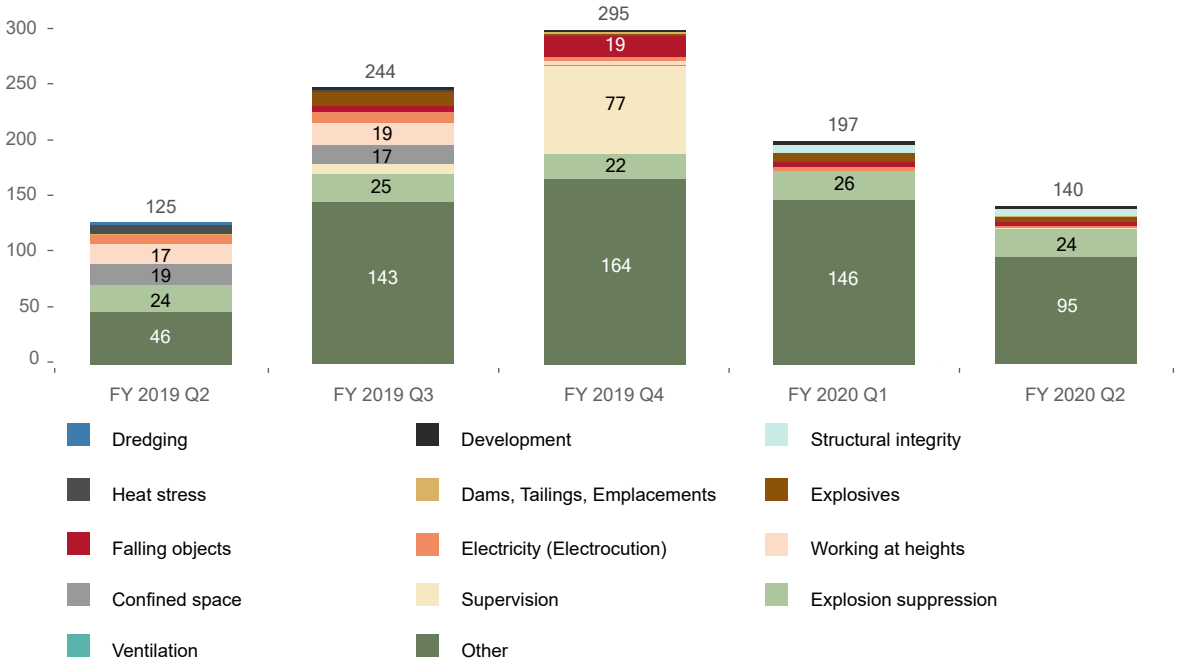
In the current quarter, planned inspections were conducted on the principal hazards shown in the graph below.

FIGURE 4. PLANNED INSPECTIONS BY PRINCIPAL HAZARD OCTOBER 2018 TO DECEMBER 2019



The graph below shows planned inspections conducted on other hazards.

FIGURE 5. PLANNED INSPECTIONS BY OTHER HAZARD OCTOBER 2018 TO DECEMBER 2019



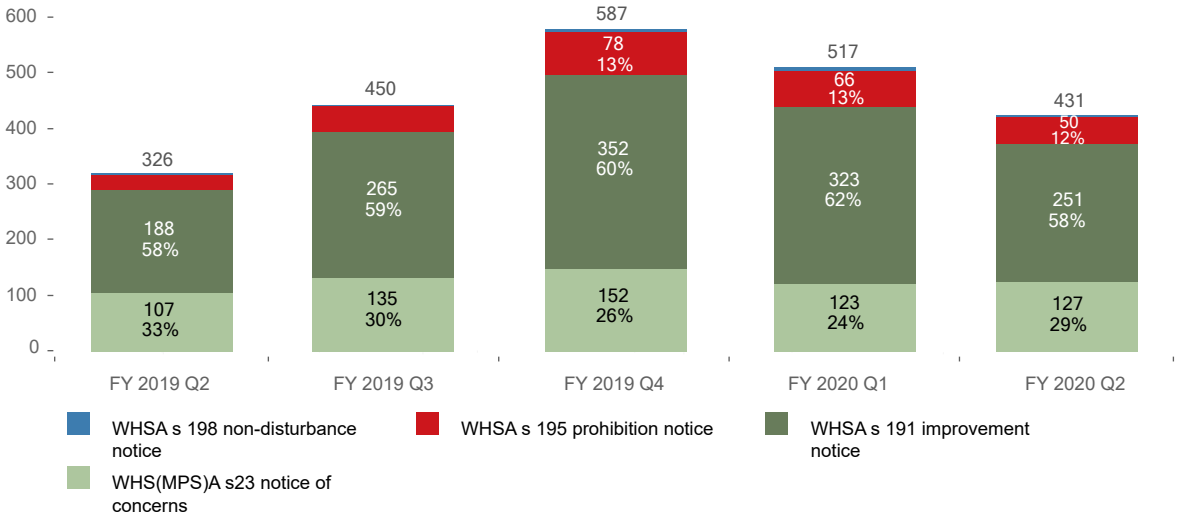
Safety notices issued

Safety notices include prohibition and improvement notices, notices of concern (written notice of matters) and non-disturbance notices.

The graph below shows the number and types of safety notices issued in the five quarters since October 2018. The number of notices issued during the five quarters does vary with a peak showing in FY2019 Q4, a reflection of the state-wide high visibility compliance operation conducted in June 2019.

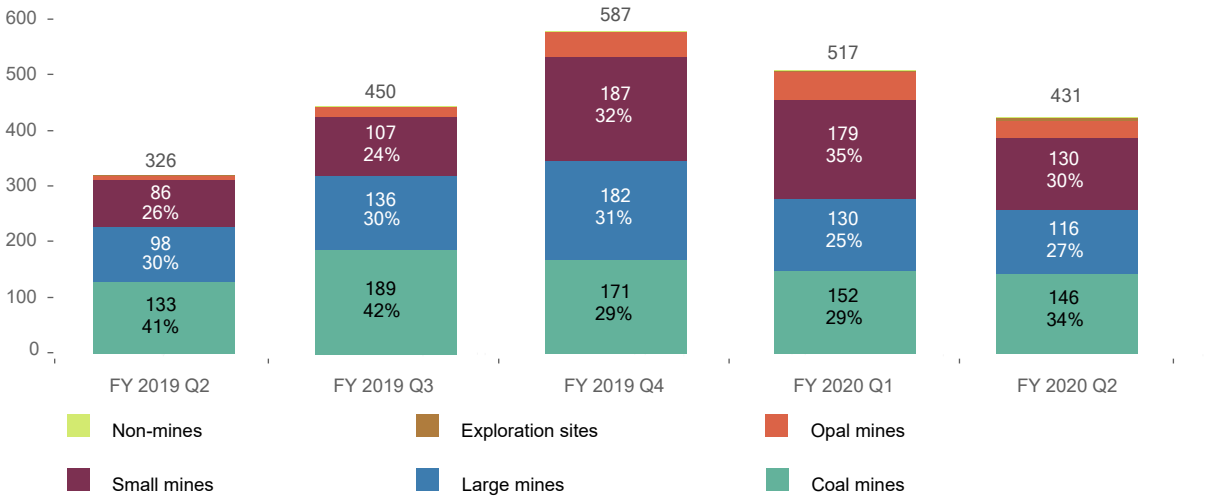
In the current October - December 2019 quarter (FY 2020 Q2), our inspectors issued 431 safety notices. This is a decrease of 86 from the 517 safety notices issued in the previous quarter, a reduction of 17%. More than half (58%) of safety notices in the current quarter were improvement notices, 29% were written notice of concerns and 12% (50 of 431) were prohibition notices.

FIGURE 6. SAFETY NOTICES ISSUED BY TYPE OCTOBER 2018 TO DECEMBER 2019



For the October – December 2019 quarter, one-third of safety notices were issued to coal mines. More than one-quarter of safety notices were issued to large mines which represents a slight increase for the sector, as compared to the previous quarter. The number of safety notices issued to small mines has decreased to 30%, making it the second largest contributing sector to the number of notices this quarter. This, in part, reflects the nature of inspection activity in the quarter.

FIGURE 7. SAFETY NOTICES ISSUED BY SECTOR OCTOBER 2018 TO DECEMBER 2019

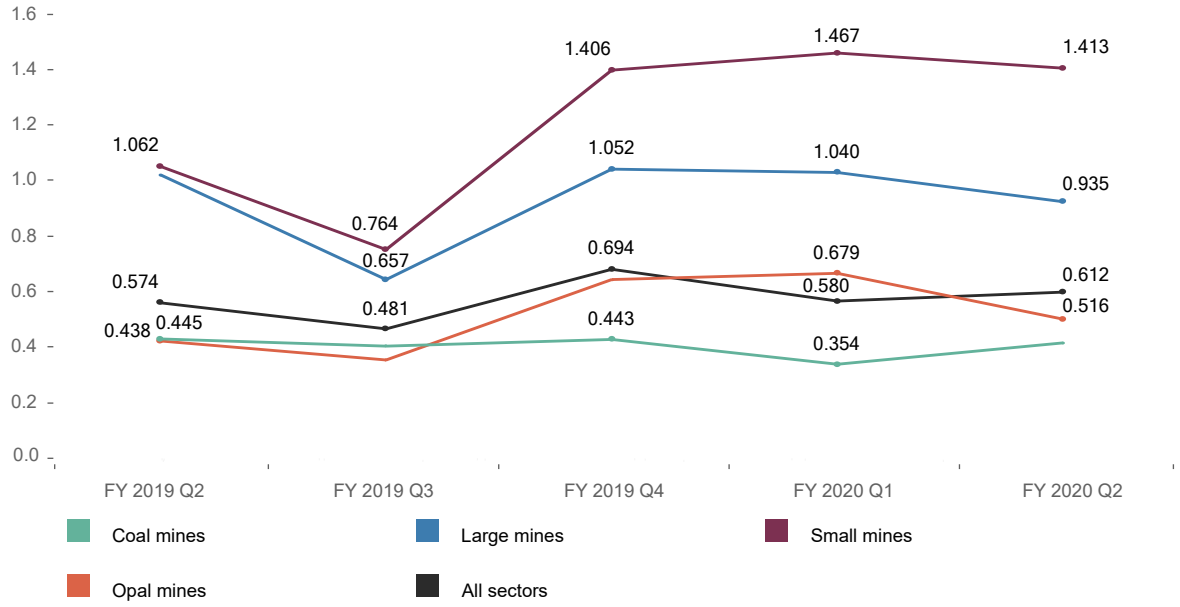


Safety notice issue rate

Across all mining sectors the safety notice issue rate was 0.61 per assessment for the October – December 2019 quarter. Compared to the previous quarter this represents a slight increase of 5%. While the rate of notices issued per assessment has increased for the coal sector, there has been an downward trend in notice rates for each of the other sectors, since FY 2020 Q1.

Of note petroleum and geothermal sites, exploration sites and non-mines have been included in the all sectors category.

FIGURE 8. SAFETY NOTICES ISSUE RATE BY SECTOR OCTOBER 2018 TO DECEMBER 2019



Hazards

The Work Health and Safety (Mine and Petroleum Sites) Regulation 2014 (the regulation) identifies principal hazards for special consideration because they have a reasonable potential to result in multiple deaths in a single incident or a series of recurring incidents.

There are nine principal mining hazards specified in the regulation. A principal hazard can also be identified by the mine operator through risk assessment.

Principal mining hazards

GROUND OR STRATA FAILURE

FIRE OR EXPLOSION

INUNDATION OR INRUSH OF ANY SUBSTANCE

GAS OUTBURSTS

MINE SHAFTS AND WINDING SYSTEMS

SPONTANEOUS COMBUSTION

ROADS OR OTHER VEHICLE OPERATING AREAS

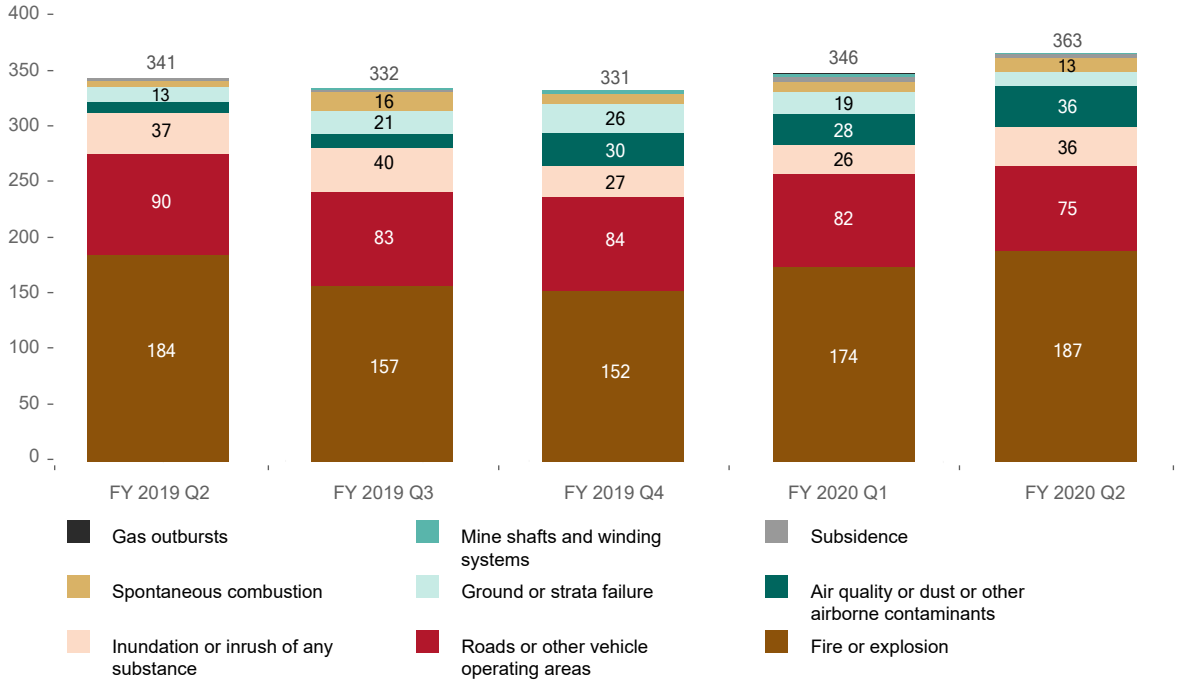
SUBSIDENCE

AIRBORNE DUST AND OTHER AIRBORNE CONTAMINANTS

(HAZARDS IDENTIFIED BY THE MINE OPERATOR) PROHIBITED ITEMS OR SUBSTANCES

The figure below, shows numbers of incidents where the incident relates to the principal hazard, as defined in clause 5 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014.*

FIGURE 9. INCIDENT NOTIFICATIONS BY PRINCIPAL HAZARD



The table below shows all the notifications by principal hazard, for the last five quarters (July 2018 to December 2019)

TABLE 2. INCIDENT NOTIFICATIONS BY PRINCIPAL HAZARD (COMPLETE SET)

PRINCIPAL HAZARD	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	TOTAL
Gas outbursts	-	-	-	1	-	1
Mine shafts and winding systems	-	1	3	3	1	8
Subsidence	2	2	1	4	3	12
Spontaneous combustion	6	16	8	9	13	52
Ground or strata failure	13	21	26	19	12	91
Air quality or dust or other airborne contaminants	9	12	30	28	36	115
Inundation or inrush of any substance	37	40	27	26	36	166
Roads or other vehicle operating areas	90	83	84	82	75	414
Fire or explosion	184	157	152	174	187	854
Total	**341**	**332**	**331**	**346**	**363**	**1713**

Air quality, dust or other airborne contaminants

Airborne contaminants comprise a large and varied range of substances and forms. Coal and silica particles, along with methane and carbon monoxide, are regularly present in mining as dusts, fumes and vapours. These contaminants have exposure standards and can affect workers rapidly (CO or CO2) or over several years (coal or silica).

COAL AND SILICA DUST

Safe Work Australia republished the workplace exposure standard for airborne contaminants (WESFAC) in December 2019 with a new respirable crystalline silica exposure standard of 0.05mg/m3. WESFAC applies under clause 5 of the Work Health and Safety Regulation 2017.

On 19 December 2019, a class exemption was made to exempt mine and petroleum sites from having to comply with the new respirable crystalline silica exposure standard in WESFAC. However, the Minister for Better Regulation Kevin Anderson has announced that the new crystalline silica workplace exposure standard of 0.05mg/m3 will take effect from 1 July 2020.

Safe Work Australia has announced that the respirable coal dust exposure standard will be lowered to 1.5mg/m3 in three years through an amendment to WESFAC. We are considering an appropriate transitional arrangement for the new respirable coal dust exposure standard. The current exposure standard is 2.5mg/m3 (clause 39 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014).

TWO POSSIBLE DUST DISEASE CASES BEING INVESTIGATED

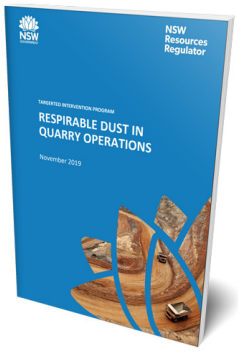
Investigations are under way for two new cases of possible dust disease. Both workers were detected through health surveillance screening.

One case relates to a current worker in his 60s with coal dust pneumoconiosis who was largely employed in Queensland open cut mines for over 40 years before moving to a NSW open cut coal mine in recent years.

The second case relates to a current worker in his 40s who has an unconfirmed case of pneumoconiosis. He worked in an underground mine for the past nine years and is not known to have worked in any other jurisdictions or high-risk industries.

These cases were detected under NSW mandatory health monitoring requirements, and the priority is to ensure workers are getting the best possible support and care.

Over the past 12 months, 45 targeted assessments and inspections have been undertaken as part of a major compliance campaign to ensure appropriate dust controls are in place to minimise exposure risks to workers.



COMMON DUST HAZARD MANAGEMENT ISSUES

Our recently published Targeted Intervention Program (TIP) report on respirable dust in quarry operations presents the findings of assessments undertaken in relation to the hazard of respirable dust in NSW quarry operations, which started in September 2019 and involved 24 mines.

The TIP process identified many common issues around the approach taken by the sites to manage the hazard of dust. It also highlighted broader issues that are common across mine sites associated with the process of developing, implementing and reviewing the risk assessments, management plans, and procedures.

The Regulator expects that all mines will review their procedures and practices in consideration of the findings from this report.

Click here to download the full report

While the NSW mining industry employs a range of controls to manage dust, the control focus has remained on the prevention of dust generation during operation activities. Exposure monitoring results show that maintenance activities account for a high number of worker exposures. The Resources Regulator acknowledges the risk management focus being placed on other activities such as maintenance instead of only being focused on production activities. Our mine safety inspectors recently observed good practice risk assessment and control planning around this issue.

The Daracon Group (a civil construction service provider) identified the risks for several of their maintenance operations and set about addressing them. The idea was born from a WHS committee meeting and initially implemented at their Buttai and Martins Creek quarry operations. After a long consultation process, including consulting contractors, it is being rolled out at several Daracon mine sites.

The approach was formulated from the ground up and was supported by Daracon's leadership team. It involved a detailed analysis of vehicles and plant operated by the group, including a global risk assessment which considered the entire lifecycle of the equipment.

A maintenance matrix was then developed to map all controls (by position on the hierarchy) and identify mandatory and non-mandatory elements. This is communicated via a poster, which is available to all personnel undertaking each of the maintenance tasks.

The group has also begun trialling several other 'at the source' dust suppression controls, like their halo system on crushers and screens.

The Daracon Group hopes to roll-out the same process at all their relevant sites and extend it into a similar coverage for their operating staff.

FROM 19
12

Ground or strata failure

Ground or strata failure is an ever-present hazard in both surface and underground mining, with a significant risk posed to workers from unplanned movement of ground.

DANGEROUS INCIDENT - TONS OF ROCK AND DIRT, BRIEFLY TRAP WORKERS AND VEHICLES

A rock fall (approx. 200 - 300 tonne of rock, 1.5m in width and about 1m in depth) at a lower level, access cross cut, trapped an underground loader and a light vehicle. There was no damage to either vehicle, as they were in the drive, behind the rock fall. While most of the rock appears to have come out of the primary exhaust vent, this did not impact the ventilation.

The operator, who was sitting in the light vehicle, witnessed the rock fall, some five to 10 metres from his vehicle.

Recommendations include;

- When developing strata trigger action response plans (TARPs) and support plans, mine operators must consider the predicted stress regime of the surrounding strata, through the full lifecycle of a driven roadway.
- This incident shows the importance of mine operators establishing and maintaining secondary escapeway.

FROM 4
3

Subsidence

Subsidence hazards are a potential in any land, below which, there has been underground mining. The potential to cause significant damage (from deformation or sinkholes) to infrastructure (roads, dwellings etc.) and injure persons nearby, makes this a principal hazard in NSW.

Inundation or inrush of any substance

Inundation and inrush is a low frequency, high consequence hazard, particularly in underground mining. Incidents often involve inrushes of water or inundation by denser materials (sand or rock). The potential to cause multiple fatalities in a single event like at Gretley Colliery in 1996, make this a principal hazard in NSW.

DANGEROUS INCIDENT - WORKERS NARROWLY ESCAPE INUNDATION

During a shut-down at a coal preparation plant, two workers were erecting scaffold in an enclosed sump, at a wash plant. During their work, a large volume of water (approx. 3000 litres) was released from the overflow circulator distributor, into the work area. The level of water in the sump rose dramatically, causing the workers to quickly exit the sump, as the water rose above the egress point. During the workers' escape, one suffered a knee injury.

Recommendations include;

- Mine operators need to be vigilant to ensure that all hazards are identified, and appropriate controls are in place to prevent risks to workers while plant maintenance is being carried out.
- Clear emergency rescue protocols for all confined spaces, in which work is carried out.
- Consideration of a secondary means of egress, for confined spaces.

Mine shafts and winding systems

Mine shaft integrity and the operation of winding systems require specific focus. The safe movement of material and workers up/down mine shafts is hazardous and has the potential to impact on the safety of multiple workers at a mine.

We published a safety bulletin after a person-riding gemstone hoist winch rope was found with the inner strand of the rope protruding from the rope lay in two places. This condition reduced the strength of the rope. This may have caused it to break and injure people, on or under the conveyance:

- SB19-16 Gemstone hoist rope

Gas outbursts

Gas outbursts are not a high frequency hazard event, but their often sudden and violent nature, has the potential to cause fatalities to workers nearby. This hazard also includes the liberation of gases that can asphyxiate, explode or cause a fire. These circumstances make this a principal hazard in NSW.

HIGH POTENTIAL INCIDENT - GAS 'PUSH' PUTS WORKERS AT RISK

A significant gas push from an active longwall goaf tripped power and forced the evacuation of an underground coal mine (under trigger action response plan [TARP] conditions). The gas appeared to come from a roof break in the goaf. Peak gas readings were 3.7% in the tailgate and 1.9% in the bleeder return heading. The longwall had pre and post-drainage and the mine increased its post drainage suction after the event to manage the gas levels. The mine followed all withdrawal TARPs at the time of the event.

Recommendations include:

- Effective gas drainage and main ventilation systems are essential for the control of gas and the safe operation of coal mines.
- Withdrawal TARPs must be enacted immediately after alarms have been activated.
- Mines should identify, through a risk assessment, all events that would require withdrawal of workers from the mine.

Spontaneous combustion

While spontaneous combustion (of methane) is a hazard exclusive to the coal sector, the consequences have the potential to cause multiple fatalities and devastate entire communities.

We published a safety bulletin after being made aware of an incident at an interstate underground mine where an independent investigation verified that a spontaneous combustion of fire resistant and anti-static conveyor rubber could be replicated in a laboratory:

- SB19-12 Spontaneous combustion of conveyor rubber

Roads or other vehicle operating areas

Vehicle movements in and around mine sites, requires specific design considerations and controls, to ensure that collisions and other vehicular accidents do not occur, and place workers lives at risk. The high volume of vehicular interactions on mine sites and the size of the mobile plant utilised classifies this as a principal hazard in NSW.

One worker died and several others have been exposed to significant health and safety risks in recent incidents featuring dozer operations at NSW mine sites. These incidents included rollovers, a near miss over a drop off and a rollover caused by off-centre engagement of a ripper. We published a safety bulletin to highlight these risks:

- SB19-10 Dozer incidents increase despite warnings

DANGEROUS INCIDENT - INATTENTION AND DISTRACTION LEAD TO COLLISION

An incident occurred on the incline of a ramp of a surface coal mine. The operator had been driving the Cat793 up a ramp fully loaded and was near the end of the shift. During an attempt to reduce the brightness of the modular screen, by putting on glasses, the operator inadvertently ceased accelerating.

At this stage the vehicle begun rolling back, but the operator did not immediately notice. It rolled approximately 30 metres towards another vehicle (a loaded Liebehhr T282) that was coming up the same ramp. The second operator saw the Cat793 rolling backwards and moved to the right-hand side of the ramp (oncoming side) at about 45 degrees. The very rear part of the tailgate of the tray on both trucks contacted. Impact occurred at low speed (approximately 10kph).

Nobody was injured and an investigation into the incident is continuing.

Recommendations include:

- Machine operator cabs are work areas and driver ergonomics are important.
- Mine operators should review machine operators' cabs to ensure items that could distract operators while in operation are minimised.
- Operators should also instruct drivers to stop in designated safe areas to make any adjustments to equipment.

INVESTIGATION INTO CRASH AT WILPINJONG MINE FINALISED

The NSW Resources Regulator has finalised its Causal Investigation into a heavy vehicle collision earlier this year involving automated machinery at Wilpinjong coal mine near Mudgee.

The investigation was undertaken in conjunction with mine operators, equipment manufacturers and worker representatives and identified several safety improvements.

A bulldozer operating in semi-autonomous mode collided with an excavator

during operations at the mine on 27 May 2019, shunting the excavator and leaving the driver trapped. The excavator driver was rescued and was not injured.

The incident was of particular interest as the trialling and use of autonomous and remote-controlled equipment is increasing in mines throughout NSW.

The investigation identified a number of contributing factors to the incident including poor sight lines and a breakdown in communications.

However, of even more importance, the investigation and subsequent actions by the operator identified a number of key engineering and technology measures that have since been implemented to prevent reoccurrence.

These include the installation of a proximity awareness and autonomous stop system on all machinery and portable units for staff working in the area, installation of an aerial camera and increased separation between machinery.

Any mine operator using or considering the use of autonomous machinery should review the full investigation report to see if any of the lessons can be applied to their operations.

A video and report on the outcomes of the investigation has been released and are available here.

Fire or explosion

This principal hazard includes risk associated with all sources of flammable, combustible and explosive substances and materials in the working environment. A common source of these incidents are fires on mobile plant (at both underground and surface operations). This principal hazard is distinct from the hazards covered in the explosives control plan.

We published a safety bulletin following several incidents involving universal joint or drive shaft failures resulting in fires on mobile plant. Although no-one was injured in these incidents, different circumstances could have resulted in serious injuries or fatalities:

- SB19-11 Drive shaft failures cause fires

DANGEROUS INCIDENT - FIX THE RISK BUT DON'T CREATE ANOTHER

A fire occurred on an agitator truck in an underground metals mine. The fire spread quickly with non-metallic engine covers and guards adding to the fuel load and to the intensity of the fire. 19 workers underground at the time, had to retreat to refuge chambers while the fire was brought under control. After modification and replacement of the non-metallic to metallic engine covers, another fire occurred on a similar agitator, at the same mine.

In the second incident, an operator had set up to spray cement in the decline,

when he saw a smoke (and subsequently fire) at the front of the agitator. The cause of the fire was determined to be water ingress into the starter motor. Previous modifications allowed water (which is regularly used to clean the machine) to get into the engine bay and subsequently the starter motor. This caused a short in the motor's solenoid and created overheating, which melted cable insulation and wiring. The fire was extinguished by the onboard fire suppression system and a hand-held extinguisher.

Recommendations include;

- A failure to implement a carefully planned change management process, can lead to different risks being introduced.
- Careful planning during the risk assessment stage is required to avoid introducing new hazards while attempting to eliminate another.
- Good consultation is often the key to identifying risks and the appropriate control.

RECOMMENDATIONS FOLLOW SAFETY INCIDENT AT RAVENSWORTH

The NSW Resources Regulator has issued a series of recommendations to mine operators following the finalisation of a causal investigation into a safety incident at the Ravensworth open cut coal mine in the Hunter Valley.

On 9 July 2019, while using a lance to remove a seized pin from the rear-axle link of a CAT 797 dump truck, a worker was struck by the heavy-duty pin when it was ejected unexpectedly. The worker was transported to hospital but cleared of any serious injuries.

The investigation undertaken in conjunction with the mine operator, equipment supplier, contract service providers and worker representatives, had identified the root cause of the incident, as well as number of safety recommendations.

It was identified that water travelled through the lanced hole in the pin, contacting hot slag behind it. This caused a sudden expansion of steam, forcefully ejecting the 47kg pin, striking the worker.

Recommendations include:

- implementing strategies to minimise or eliminate risks associated with this repair procedure,
- safe standing zones for workers,
- a review of hot work permit systems, thermal lancing procedures, and
- a review of the system for appointing workers authorised to perform these procedures.

A video and report on the outcomes of the investigation has been released and are available here.

Principal control plans

This section covers incidents that are of high potential, frequently occurring or of importance and complexity, that they are covered under their own control plans. There is an 'overlap' of incidents covered by these plans and those covered in certain principal hazards.

Health control plan – incidents

The health control plan covers health hazards that workers may be exposed to. These include (but are not limited to); Fatigue, dust, noise, vibration, hazardous substances, radiation.

DANGEROUS INCIDENT - HEALTH CONDITIONS NEED MANAGING ALSO

A worker at an exploration site felt unwell and reported having 'pins and needles' sensations. He was transported to hospital and it later confirmed that he had a stroke. The worker recovered in hospital. It has been reported to the regulator that doctors believe that this was a medical event and not work-related.

Recommendations include:

Environmental conditions (heat, noise, dust etc.) in the work area and their health impacts on workers should be considered.

- Characteristics of the workforce, their capabilities and demands of the tasks being carried out should be considered.
- Provision of medical assistance (or rescue) to ill or injured workers on remote sites.

INVESTIGATION OF INCIDENT AT CEDAR POINT QUARRY

The NSW Resources Regulator investigated the death of a worker at Cedar Point Quarry near Kyogle but determined that it was not work-related.

About 10am on Monday 14 October a worker was reportedly found unconscious and unresponsive in the cabin of the excavator he was operating.

NSW ambulance attended the scene but were unable to revive the worker. Read the Investigation Information Release.

INVESTIGATION OF INCIDENT AT BULGA OPEN CUT MINE

The NSW Resources Regulator has commenced an investigation into the death of a worker at Bulga Open Cut mine in the Hunter Valley.

At around 10 am on Friday 15 November a worker was reportedly found unconscious and unresponsive in the cabin of the rubber tyred dozer he was operating.

NSW ambulance attended the scene but were unable to revive the worker.

Inspectors were deployed to the site and an investigation has commenced to determine whether or not the death was work-related.

As the investigation is underway, no further information is available at this time.

Mechanical engineering control plan – incidents

The mechanical engineering control plan covers 'lifecycle' risks associated with mechanical hazards (vehicles, plant and mechanical systems and structures), that workers may be exposed to. This includes risks associated with pressurised fluids.

We published a series of safety bulletins following incidents involving mechanical energy:

- SB19-13 Workers injured while installing conveyor boot ends
- SB19-14 Conveyor pulley failures initiate fires
- SB19 15 Rapid face bolter Incidents

A hose to the Porta-power burst while workers were checking the chain tension on the armoured face conveyor (AFC) at the tail gate of a longwall. A fitter, who was approximately 30 centimetres away, was hit on the left wrist and hand through his overalls and cut 2 rated gloves.

Fortunately, the mine uses a fluorescent dye additive to its hydraulic oil. When exposed to blue light, this dye glows, indicating the presence of oil. This additive and the blue light indicator, were then used to confirm a fluid injection injury and the worker was immediately transported to hospital. The blue light was also useful during surgery on the operator's wrist, by assisting surgeons minimise the extent of the surgery.

It is recommended that the mechanical engineering control plan consider:

- the need for all portable tools to be subjected to pre-use inspections
- that all portable tools only be used by trained and competent persons.
- the use of correct PPE and oil additives when working near pressurised hoses.

INCIDENT AT UNDERGROUND COAL MINE

An incident occurred on 21 October 2019 at an underground coal mine.

Following relocation of a boot end using a quick detach system (QDS), a conveyor belt tension caused the boot end to retract, pinning a worker underneath.

The worker sustained injuries to the pelvis and was taken by helicopter to hospital in Sydney for treatment.

The mine has confirmed the worker has not sustained fractures or serious injuries.

Inspectors were deployed to the site and an investigation has commenced.

A safety bulletin on this issue can be found here.

INCIDENT AT UNDERGROUND COAL MINE

An incident occurred on 26 October 2019 at an underground coal mine.

A worker is reported to have been struck by moving equipment at an underground work site.

The worker was airlifted to hospital and is reported to have suffered multiple broken ribs.

An inspector was deployed to the site and an investigation has commenced.

A safety bulletin on this issue can be found here.

INCIDENT AT UNDERGROUND COAL MINE

An incident occurred on 7 December 2019 at an underground coal mine.

A contractor is reported to have his foot trapped whilst undertaking a maintenance task on longwall equipment. The worker sustained serious injuries to their lower leg and foot and was airlifted to Westmead Hospital for treatment.

Inspectors were deployed to the site and have begun an investigation into the matter.

Inspectors issued a notice prohibiting the maintenance task from being undertaken until procedures and risk assessments have been reviewed.

See the incident investigation release IIR19-14.

INCIDENT AT UNDERGROUND METALS MINE

An incident occurred on 10 December 2019 at an underground metals mine.

A worker is reported to have been struck by a hose while performing maintenance on a shotcrete machine.

The worker sustained serious injuries to their leg and was taken to hospital for treatment.

Inspectors were deployed to the site and have begun an investigation into the matter.

Inspectors have issued notices prohibiting shotcreting at the mine until the necessary safe work procedures have been developed.

See the incident investigation release IIR19-13.

Electrical engineering control plan – incidents

The electrical engineering control plan covers ‘lifecycle’ risks, associated with electrical hazards (supply, vehicles, plant or infrastructure), that workers may be exposed to.

DANGEROUS INCIDENT - SHOCK TO WORKER

A worker at an underground coal mine suffered an electric shock while standing next to a shuttle car. The worker had one hand in contact with the rib mesh and the other hand touching the shuttle car. An investigation identified that the trailing cable may be non-symmetrical. Further testing of the cable will be carried out at a repair facility.

It is recommended that the electrical engineering control plan for a mine;

- Clearly sets out the control measures to manage risk to health and safety from electricity at the mine.
- Reeling or trailing cables used in the hazardous zone must comply with the requirements of the regulation.

Explosives control plan – incidents

The explosives control plan covers risks associated with the use and management of explosives hazards, that workers may be exposed to. This includes incidents involving 'flyrock'.

EXPLOSIVES UNACCOUNTED FOR, BUT NOT REPORTED

The strict control of explosives is crucial to ensuring that the associated explosion risks to workers and the community are properly managed. Acting on information provided, our mine safety inspectors visited a large quarry and found several non-compliances in the record keeping and reporting requirements, regarding missing explosives.

Prohibition and improvement notices were issued because;

- The contractor (in charge of explosives) did not report the discrepancies in the explosive's records to the mine operator, Police, DPIE and SafeWork in October 2019 when they discovered the problem.
- The mine operator (licence to store holder) did not conduct audits on explosives records kept by the contractor.
- The contractor did not follow the instructions from site security plan, for explosives owned by the mine operator.
- The contractor did not investigate the whereabouts of the 'missing' explosives.
- After being alerted, the police gave the mine 24 hours to re conciliate the explosives records.

Spotlight on Emergency Management
Industry and community collaborate during recent emergency

We have been actively involved in promoting integrated emergency planning efforts between the mining industry and emergency services across the state for several years.

A key part of developing effective emergency planning arrangements is establishing and maintaining relationships between those entities involved, a point which is even more critical across public-private sector arrangements. What is well known within the emergency management sector is that these relationships cannot be forged during an incident and must be established and maintained during the preparedness phase, so they can be put into action during emergency operations.

Lithgow coal mining operations worked with their local emergency services and local communities during the recent bushfire emergencies to help defend not only their own assets, but those of local community members also: https://www.abc.net.au/news/2020-02-09/gospers-mountain-miners-puts-differences-aside-to-fight-fires/11946672

For more information on mine emergency planning see: https://www.resourcesregulator.nsw.gov.au/safety-and-health/topics/emergency-planning

Spotlight on Leadership
Leadership and supervision, important contributors to safety

'Where the rubber hits the road' is a familiar saying when it comes to safety and it is perhaps most relevant when talking about managers and the role they play influencing and modelling safety standards. Our mine safety inspectors recently observed positive onsite leadership with a real impact at small mines.

At Holcim Teven mine, a small quarry with about 10 workers, inspectors observed a highly engaged and motivated workforce.

Good safety practices observed onsite were:

- The use of solenoid-controlled timers to turn on/off a water sprinkler system that runs down either side of the mines roads to help control dust.
- The extensive use of positive communications for vehicles operating throughout the mine pit including asking radio operators to repeat messages when they were not heard or were unclear
- The prioritisation of safety critical systems during the maintenance
- The utilisation of manufacturer documentation and specification when carrying out maintenance, to ensure quality assurance.

Sector profiles

NSW Resources Regulator

SECTOR REPORTING

Coal mines

Opencut, underground and coal preparation plants

Large mines

METALLIFEROUS AND QUARRIES

Quarries that produce >900,000 tonnes pa and large opencut or underground metalliferous mines

Small mines

METALLIFEROUS, QUARRIES AND OTHER GEMSTONES

Quarries and other mine types (e.g. sand, clay, lime) that produce <900,000 tonnes pa, opencut or underground metalliferous mines and gemstone mines

Petroleum and Geothermal

Onshore petroleum and geothermal productions and exploration sites

Opal Mines

Opal mines at Lightning Ridge and White Cliffs

Exploration

Exploration sites (excluding petroleum)

Non-mine

Includes many manufacturers (including OEMs), suppliers, designers, importers, licence holders and registration holders

Coal sector

Safety incident notifications

Mine operators must notify the regulator about the occurrence of certain types of safety incidents.

As presented in the table below, incident rates (numbers of incidents reported per active mine) have remained relatively stable during the past 15 months. On average, 46% of coal mines notified an incident. During the past five quarters, on average 56 individual mines reported safety incidents.

TABLE 3. COAL SECTOR INCIDENT NOTIFICATION RATES OCTOBER 2018 TO DECEMBER 2019

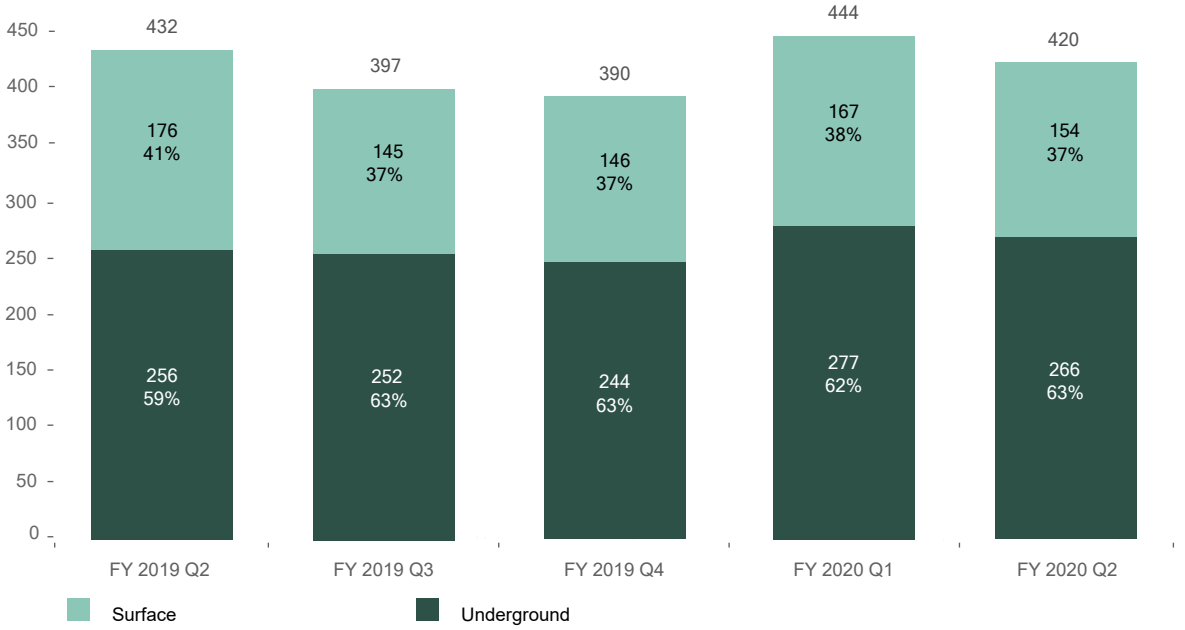
MEASURE	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Incidents	432	397	390	444	420	417
Active mines	114	121	123	122	128	122
Incident rate per active mine	3.789	3.281	3.171	3.639	3.281	3.432
Mines that notified incidents	57	53	54	60	55	56
% of mines notifying an incident	50%	44%	44%	49%	43%	46%
Incident rate per notifying mine	7.579	7.491	7.222	7.400	7.636	7.466

The graph below shows the proportion of safety incident notifications received from surface and underground coal operations.

In the current quarter (FY 2020 Q2), we received 420 safety incident notifications from the coal mines sector. This represents a 3% decrease when compared to the same period in the previous year (FY 2019 Q1).

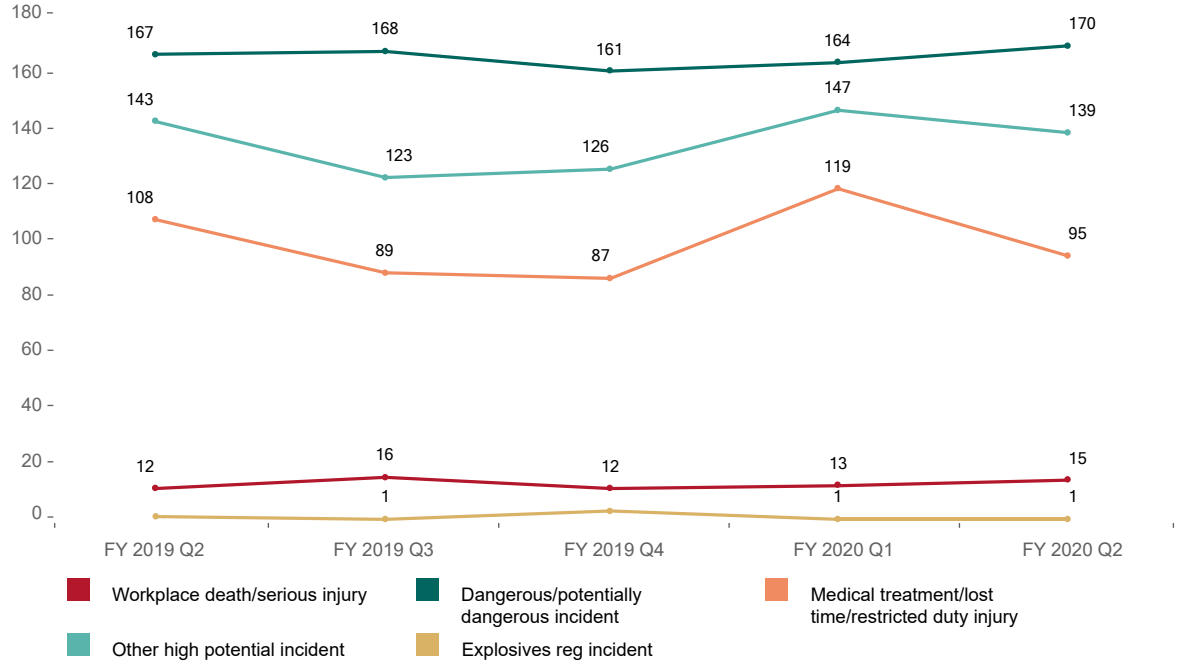
In the current quarter almost two-thirds of safety incident notifications received from the coal sector (63%), were from underground coal mines. During the past five quarters, the proportion of safety incident notifications by underground coal mines has remained relatively consistent (62% of all notifications from the coal sector, on average).

FIGURE 10. COAL SECTOR SAFETY INCIDENT NOTIFICATIONS BY OPERATION TYPE OCTOBER 2018 TO DECEMBER 2019



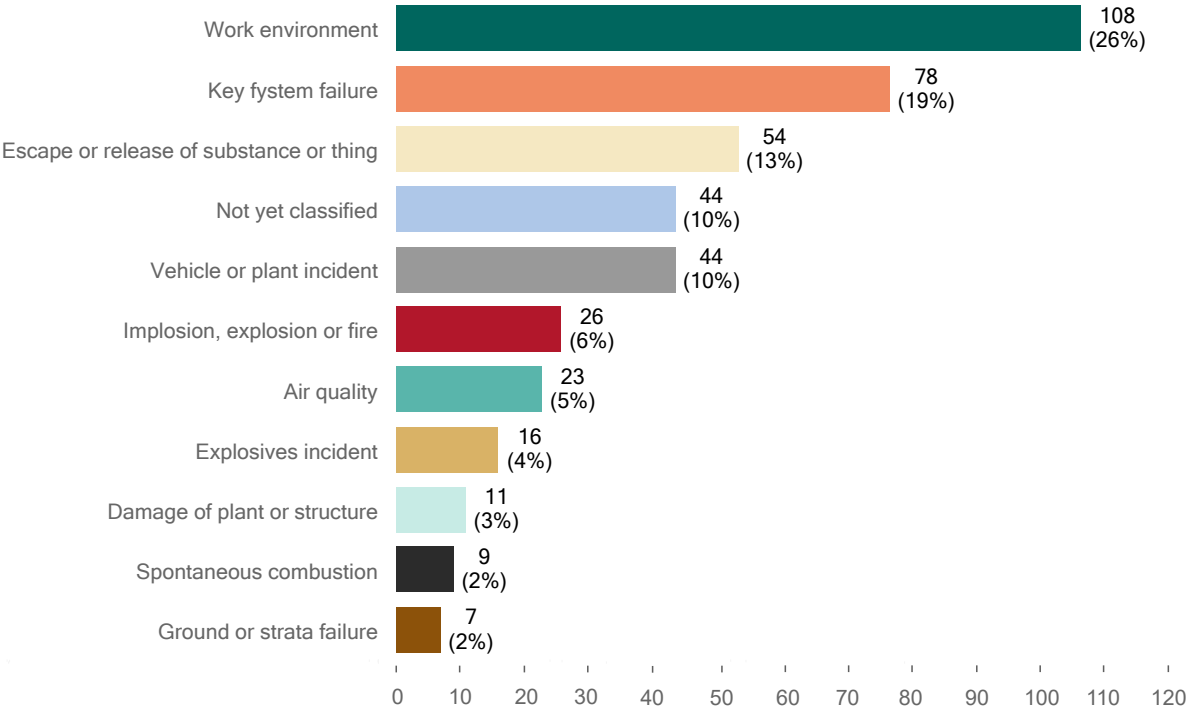
Just more than 40% (170 of 420) of the notifications received in the current quarter (FY 2020 Q2) were for dangerous/potentially dangerous incidents. The number of these incidents has remained relatively stable during the past four quarters. A decrease in the number of 'other high potential' and 'medical treatment, lost time and restricted duty injury incidents' was observed this quarter compared to the last quarter.

FIGURE 11. COAL SECTOR SAFETY INCIDENT NOTIFICATIONS BY INCIDENT TYPE OCTOBER 2018 TO DECEMBER 2019



Of the 420 safety incident notifications received in the current quarter (FY2020 Q2), about 26% were classified as work environment, 10% vehicle or plant and 19% key system failures. Work environment incidents include (but are not limited to) slips, trips and falls, falling flying objects, fall from heights, ventilation and noise. Key system failure incidents are those that include (but not limited to) explosion protection, ventilation winder, site power and other systems failure.

FIGURE 12. COAL SECTOR SAFETY INCIDENT NOTIFICATIONS BY INCIDENT TYPE OCTOBER 2018 TO DECEMBER 2019



Large mines and large quarries sector

Safety incident notifications

As presented in the table below, incident rates (numbers of incidents reported per notifying mine) during the past 15 months on average, 61% of mines notified an incident. During the past five quarters, on average 22 individual mines reported safety incidents.

TABLE 4. LARGE MINES AND QUARRIES SECTOR INCIDENT NOTIFICATION RATES OCTOBER 2018 TO DECEMBER 2019

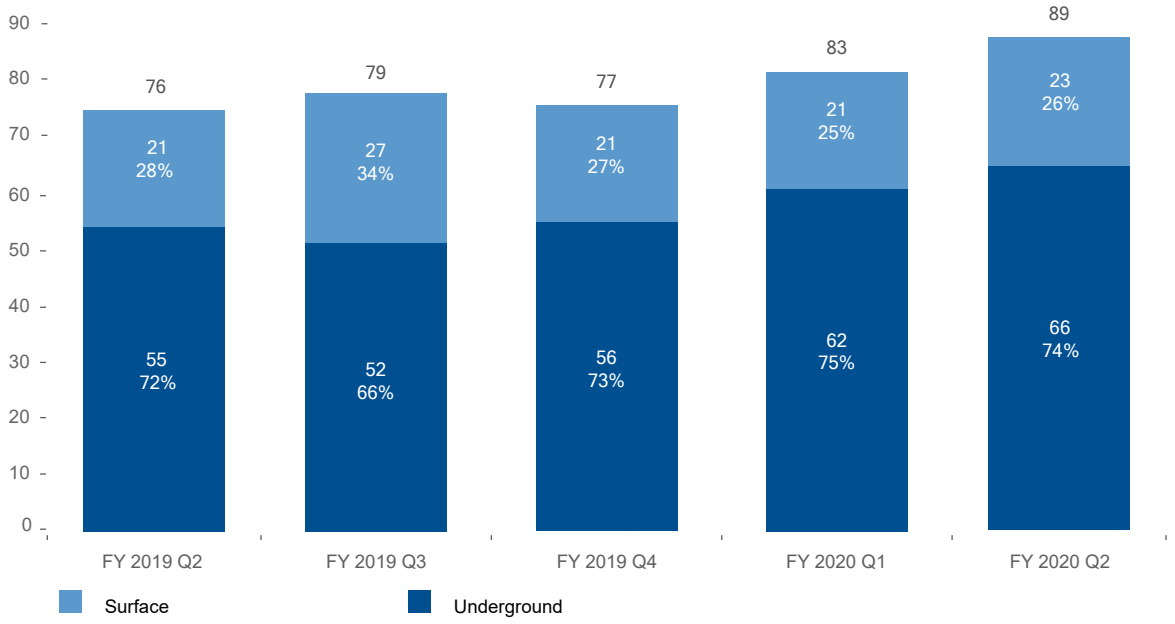
MEASURE	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Incidents	76	79	77	83	89	81
Active mines	37	36	38	37	38	37
Incident rate per active mine	2.054	2.194	2.026	2.243	2.342	2.1718
Mines that notified incidents	23	21	26	22	24	23
% of mines notifying an incident	62%	58%	68%	59%	63%	62%
Incident rate per notifying mine	3.304	3.762	2.962	3.773	3.708	3.423

We received 89 safety incident notifications from the large mines and large quarries sector.

The following graph shows the proportion of safety incident notifications received from surface and underground large mines and large quarries operations for the last five quarters.

In the current quarter, 74% of safety incident notifications from the large mines and large quarries sector were received from underground operations. During the past five quarters, most of the safety incident notifications were by underground operations (varying between 66% to 75% of notifications).

FIGURE 13. LARGE MINES AND QUARRIES SECTOR SAFETY INCIDENT NOTIFICATIONS BY OPERATION TYPE OCTOBER 2018 TO DECEMBER 2019

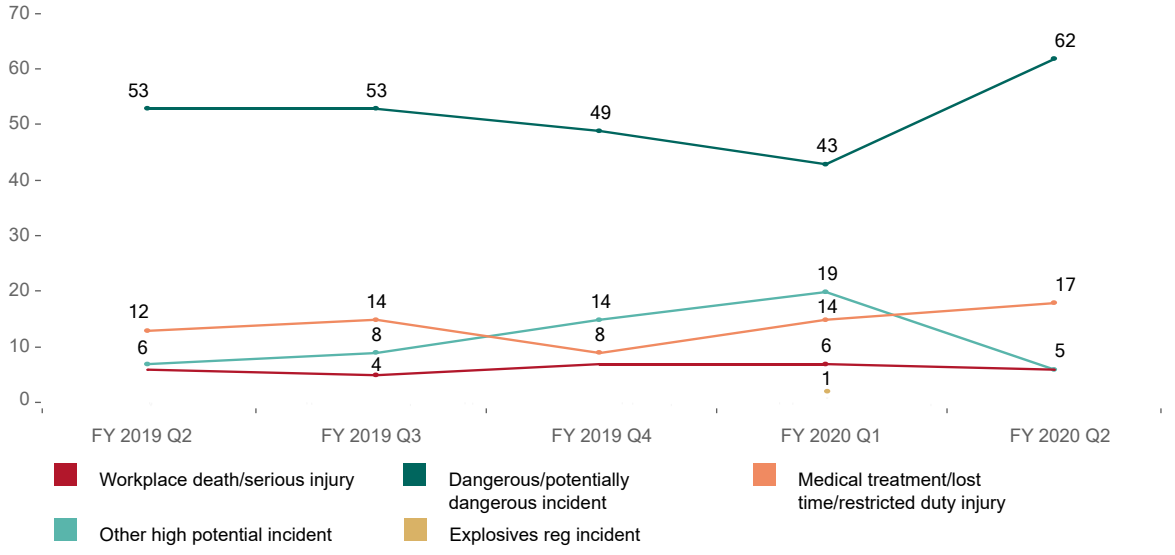


The graph below shows the number of safety incident notifications by incident type received during the past five quarters from large mines and large quarries sector.

In this quarter, two deaths were reported and investigations are continuing to determine whether these were work-related deaths.

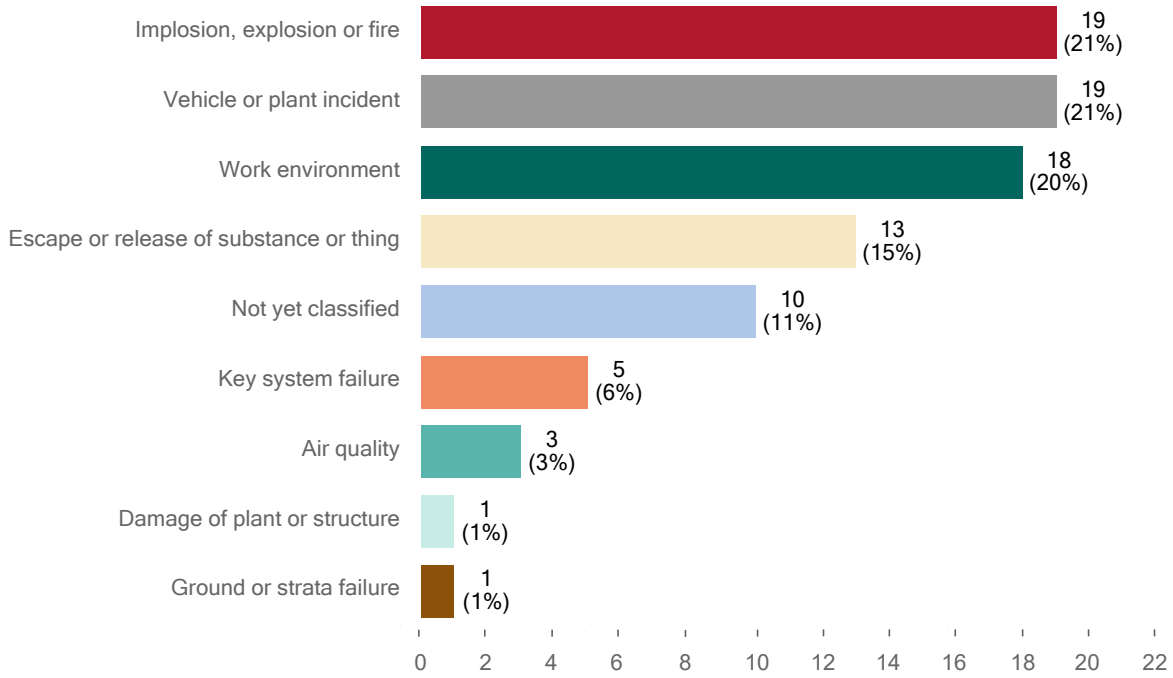
Almost 70% of safety incident notifications received (62 of 89) relate to dangerous/potentially dangerous incidents.

FIGURE 14. LARGE MINES AND QUARRIES SECTOR SAFETY INCIDENT NOTIFICATIONS BY INCIDENT TYPE OCTOBER 2018 TO DECEMBER 2019



Of the 89 safety incident notifications received in the current quarter (FY2020 Q2), about 20% were classified as work environment, 21% vehicle or plant and 21% implosion, explosion or fire. Work environment incidents include (but are not limited to) slips, trips and falls, falling flying objects, fall from heights, ventilation and noise.

FIGURE 15. LARGE MINES AND QUARRIES SECTOR SAFETY INCIDENT NOTIFICATIONS BY INCIDENT TYPE CLASSIFICATION OCTOBER 2018 TO DECEMBER 2019



Small mines and small quarries sector

Safety incident notifications

As presented in the table below, incident rates (numbers of incidents reported per active mine) have remained relatively stable during the past 15 months. On average 1.03% of small mines notify safety incidents. During the past five quarters, on average 27 individual small mines reported safety incidents.

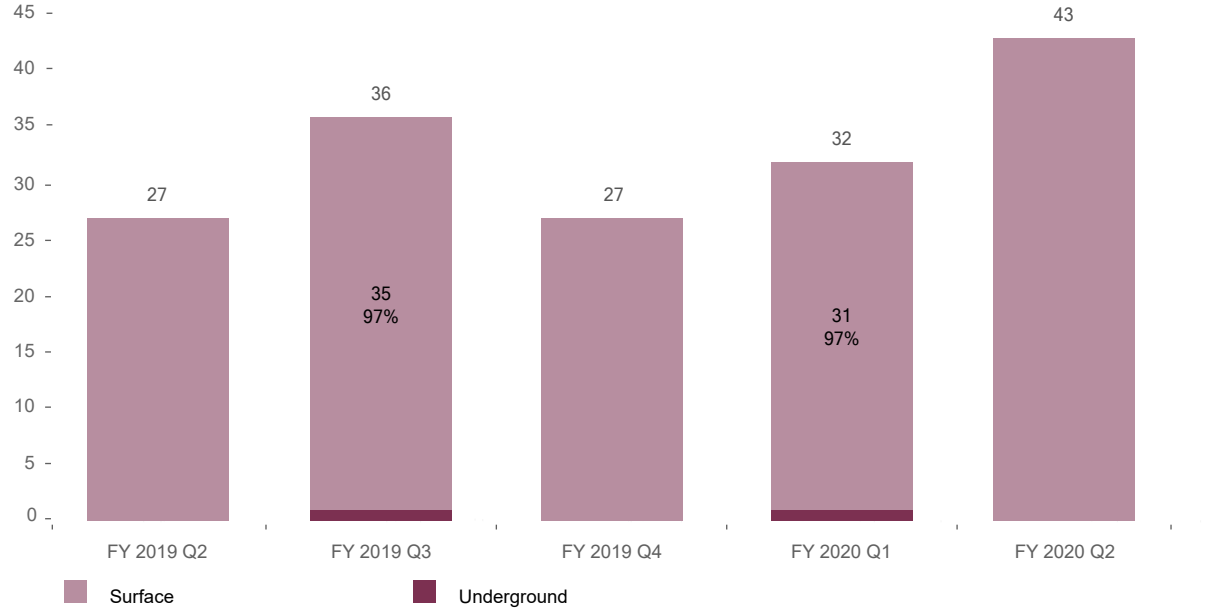
TABLE 5. SMALL MINES AND QUARRIES SAFETY INCIDENT NOTIFICATION RATES OCTOBER 2018 TO DECEMBER 2019

MEASURE	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Incidents	27	36	27	32	43	33
Active mines	2,633	2,653	2,648	2,661	2695	2,658
Incident rate per active mine	0.010	0.014	0.010	0.012	0.016	0.012
Mines that notified incidents	25	30	20	27	35	27
% of mines notifying an incident	0.95%	1.13%	0.76%	1.01%	1.30%	1.03%
Incident rate per notifying mine	1.080	1.200	1.350	1.185	1.229	1.209

The graph below shows the number of safety incident notifications received during the past five quarters from the small mines and small quarries sector. Of note these are small numbers of notifications so a trend cannot be easily ascertained.

In the current quarter (FY 2020 Q2), we received 43 safety incident notifications from the small mines and small quarries sector, which is just above 30 % higher than the average number (33) of incident notifications during the last five quarters.

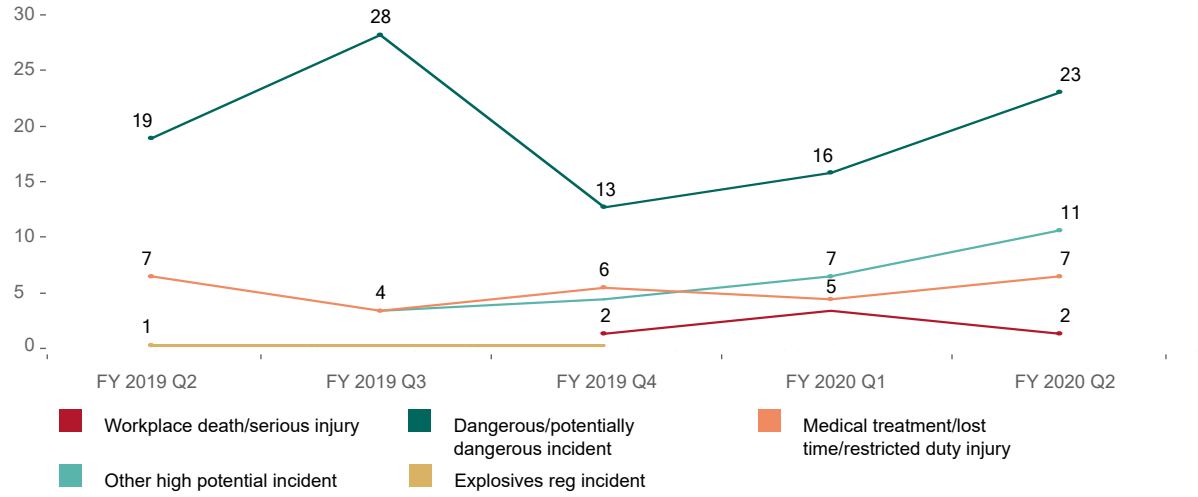
FIGURE 16. SMALL MINES SECTOR INCIDENT NOTIFICATIONS BY OPERATION TYPE OCTOBER 2018 TO DECEMBER 2019



The graph below shows the number of safety incidents notifications received during the past five quarters from the small mines sector.

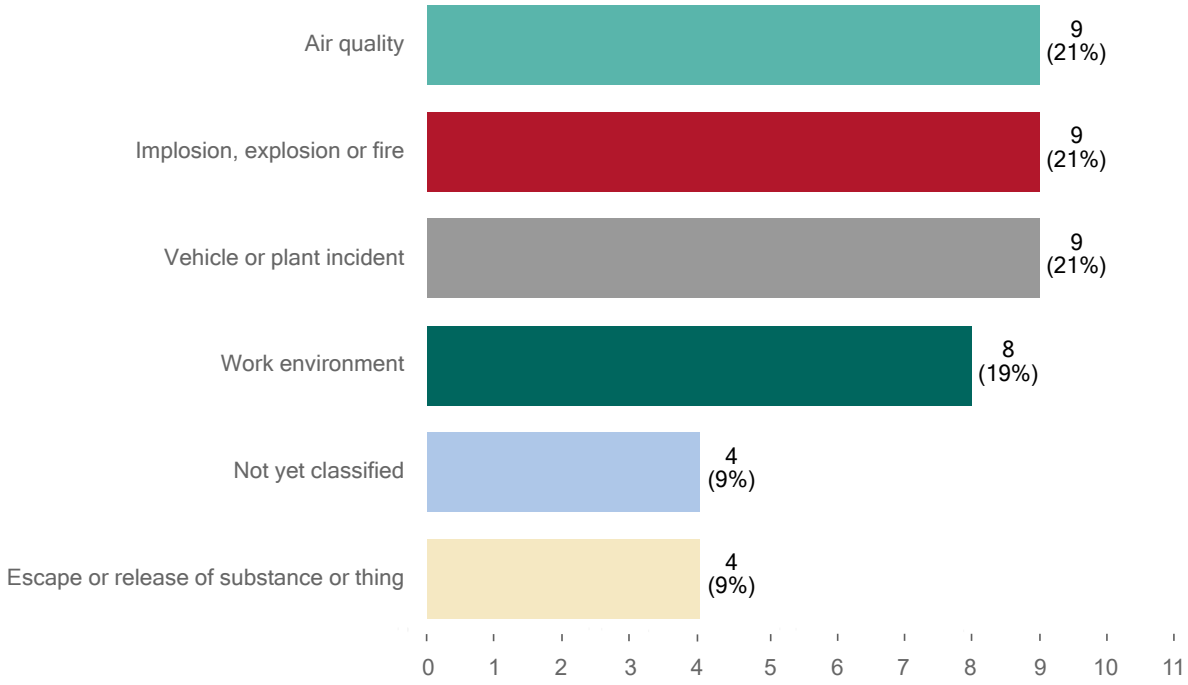
The majority (53%) of safety incidents for the small mines sector relate to dangerous/potentially dangerous incidents (23 of 43).

FIGURE 17. SMALL MINES SECTOR SAFETY NOTIFICATIONS BY INCIDENT TYPE OCTOBER 2018 TO DECEMBER 2019



Of the 43 safety incident notifications received in the current quarter (FY 2020 Q2), 19% were classified as work environment, 21% vehicle or plant and approximately 21% air quality. Work environment incidents include (but are not limited to) slips, trips and falls, falling flying objects, fall from heights, ventilation and noise.

FIGURE 18. SMALL MINES AND QUARRIES SECTOR SAFETY NOTIFICATIONS BY INCIDENT TYPE CLASSIFICATION OCTOBER 2018 TO DECEMBER 2019



Opal mines sector

Safety incident notifications

In the current quarter, there were no incidents notified to us by the opal mine sector.

TABLE 6. OPAL MINES SECTOR SAFETY INCIDENT NOTIFICATION RATES OCTOBER 2018 TO DECEMBER 2019

MEASURE	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Incidents	2	0	1	2	0	1
Active mines	3,436	3,522	3,564	3,733	3811	3,613
Mines that notified incidents	2	0	1	2	0	1

Opal sector compliance activities

The table below shows the number of assessments conduced and notices issued by us for the opal mine sector during the last five quarters.

In this quarter (FY 2020 Q2), we issued 33 safety notices (representing approximately 8% of all industry safety notices issued) and conducted 64 safety assessments (representing approximately 9% all industry safety assessments).

TABLE 7. OPAL SAFETY NOTICES ISSUED AND ASSESSMENTS OCTOBER 2018 TO DECEMBER 2019

	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Safety assessments conducted	16	46	70	78	64	54.8
Safety notices issued (s23, s191, s195 and s198 notices issued)*	7	17	46	53	33	31.2
Notice issue rate per assessment	0.44	0.37	0.66	0.68	0.52	0.534

*Sections 191, 195 and 198 of the *Work Health and Safety Act 2011* and section 23 *Work Health and Safety (Mines and Petroleum Sites) Act 2013*

Petroleum and geothermal sector

Safety incident notifications

The petroleum and geothermal sector did not notify any safety incident notifications during the past five quarters.

TABLE 8. PETROLEUM AND GEOTHERMAL NOTIFIED SAFETY INCIDENTS OCTOBER 2018 TO DECEMBER 2019

	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Number of incidents notified	0	0	0	0	0	0
All sectors - total notified incidents	539	513	495	561	554	532

Petroleum and geothermal sector compliance activities

The table below shows the number of safety assessments conducted by us during the 15-month reporting period since October 2018 for the petroleum and geothermal sector. The average of assessments conducted in this sector during the 15-month reporting period is 29 assessments a quarter.

In quarter two FY 2020, we conducted 12 safety assessments. No notices were issued.

TABLE 9. PETROLEUM AND GEOTHERMAL ASSESSMENTS OCTOBER 2018 TO DECEMBER 2019

	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Number of assessments	28	33	39	35	12	29
All sectors - total assessments	568	936	846	891	704	789

Exploration sector

Safety incident notifications

As presented in the table below, incident rates (numbers of incidents reported per notifying mine) have remained relatively stable during the past 15 months. During the past five quarters, on average one individual mine reported safety incidents.

TABLE 10. EXPLORATION SECTOR SAFETY INCIDENT NOTIFICATIONS AND MINE REPORTING RATES OCTOBER 2018 TO DECEMBER 2019

MEASURE	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	AVERAGE
Incidents	2	1	0	0	2	1
Active mines	712	744	753	791	780	756
Mines that notified incidents	2	1	0	0	2	1

Exploration sector compliance activities

The table below shows the number of safety assessments conducted by us during the 15-month reporting period since October 2018 for the exploration sector.

In quarter two FY 2020, we conducted two safety assessments with five notices issued.

TABLE 11. EXPLORATION NOTICES ISSUED AND ASSESSMENTS OCTOBER 2018 TO DECEMBER 2019

	FY 2019 Q2	FY 2019 Q3	FY 2019 Q4	FY 2020 Q1	FY 2020 Q2	TOTAL
Safety assessments conducted	1	1	1	2	2	7
Safety notices issued (s23, s191, s195 & s198 notices issued)*	2	0	0	2	5	9

* Sections 191, 195 and 198 of the *Work Health and Safety Act 2011* and section 23 *Work Health and Safety (Mines and Petroleum Sites) Act 2013 NSW*