NSW GOVERNMENT

NSW Resources Regulator

# Quarterly safety report

January to March 2021

## 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. This report refers to the date the incident was notified rather than the date the incident took place.


## DOCUMENT CONTROL

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NSW GOVERNMENT

# Contents

# Executive Summary

This report is prepared to assist mine and petroleum site operators 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 the NSW Resources Regulator monitors progress in implementing our risk-based compliance and enforcement strategy.

As a high-hazard regulator, we focus on compliance with legislative requirements associated with principal and other high-risk hazards, including mechanical and electrical energy and explosives. This report highlights dangerous and high potential incidents, in addition to incidents where a serious injury occurred. 'Roads or other vehicle operating areas' and 'fires or explosion' are principal hazard classifications that feature regularly in incident notifications to the Regulator.

NSW became the first mining jurisdiction in Australian to implement an exposure standard for diesel particulate matter. The exposure standard of 0.1mg/$m^3$ commenced on 1 February 2021.

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 also provides information on significant mining events in Australia and globally, summarises safety incident notifications, compliance activities and outcomes for the quarter of January to March 2021 (FY2021 Qtr3). For selected measures, data is analysed over a 15-month period from January 2020 to March 2021.

There were no mining-related fatalities in NSW during the quarter.

In this quarter, total incident notifications received by principal hazard were down slightly (194 to 186). This figure, however, remains above the quarterly average for the previous four quarters.

Key principal hazards that saw the largest rise in notifications, compared to the previous quarter were roads or other vehicle operating areas (up 24%), fire or explosion (up 11%) and air quality or dust or other airborne contaminants (up <1%). All other principal hazards saw a decrease in notifications.

Incident notifications received by principal control plans were all down from the previous quarter. The only exception to this decrease, were incident notifications received under the electrical engineering control plan. These notifications increased 38% from the previous quarter's notifications. The recent blitz on electrical risks at large quarries, during the month of March, may have contributed to this increase.

# Quarterly snapshot

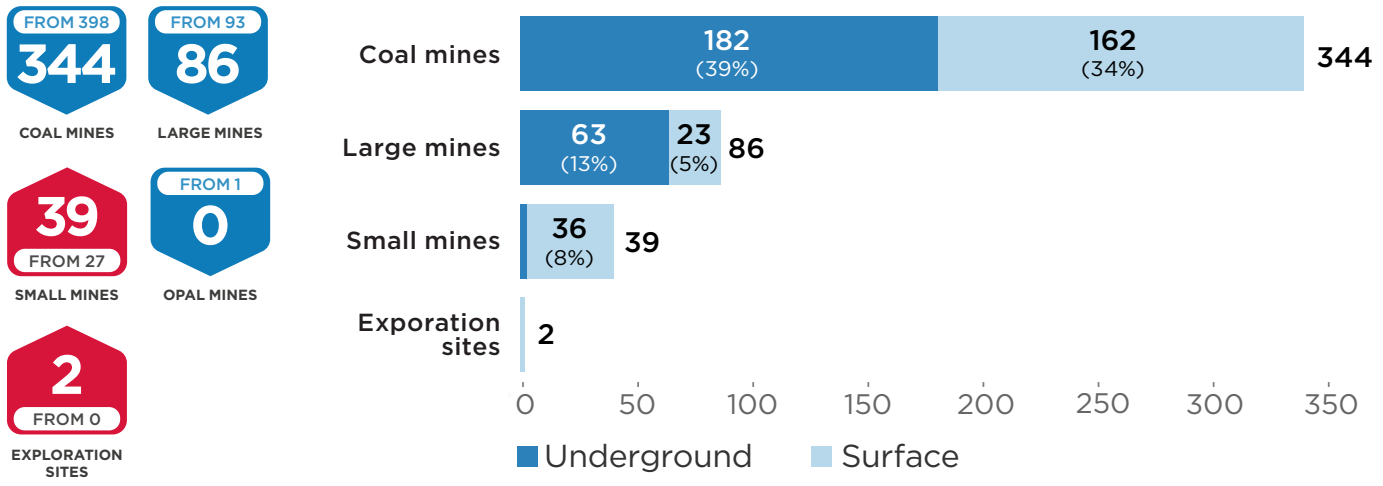
NSW Resources Regulator

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

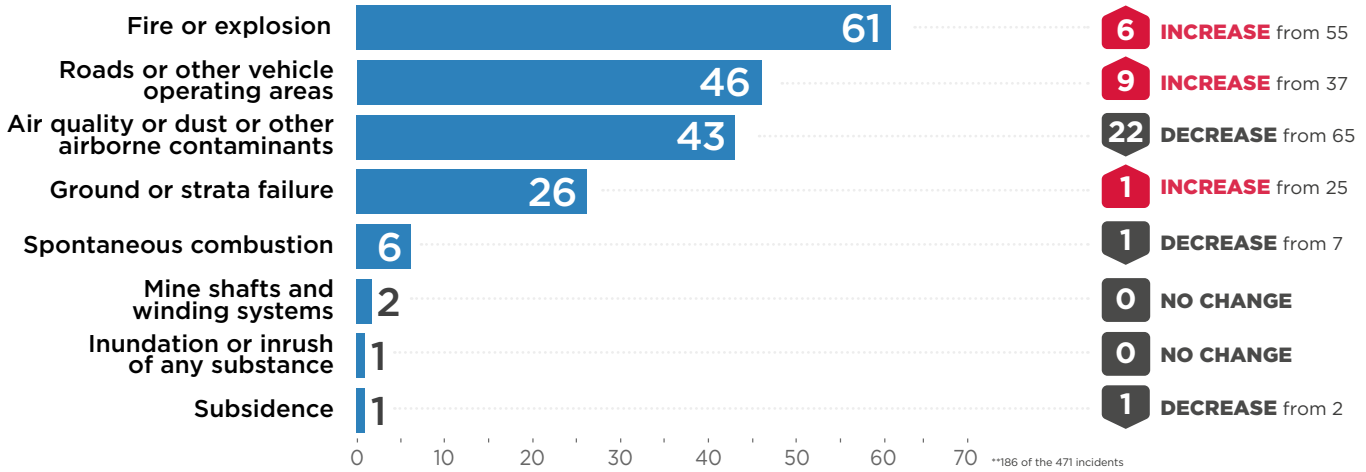
| | | | | | |
|---|---|---|---|---|---|
| 77 | Dangerous incident | **471*** incident notifications received | | Work related death | 0 |
| 89 | Potentially dangerous incident | | | Serious injury/illness | 22 |
| 171 | Other high potential incident | | | Lost time/restricted duty injury/illness >= 7 days | 73 |
| 2 | Explosives regulation incident | | | Medical treatment injury/illness | 37 |

* by requirement to report as notified by mines.
The actual number of incidents, injuries and illnesses recorded may differ from original incident notifications following assessment of the notified event.

## **Incident notifications received** by sector and operation type




## **Incident notifications classified** by principal hazard**



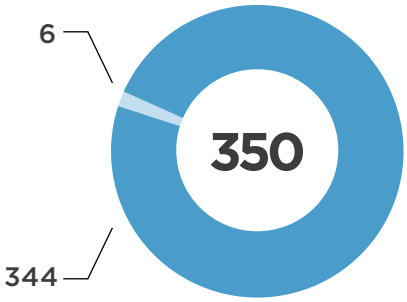
# Quarterly snapshot

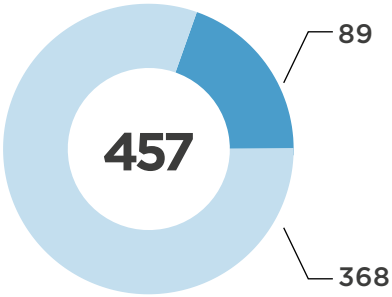
NSW Resources Regulator

**807**
**Assessments commenced**

Proactive

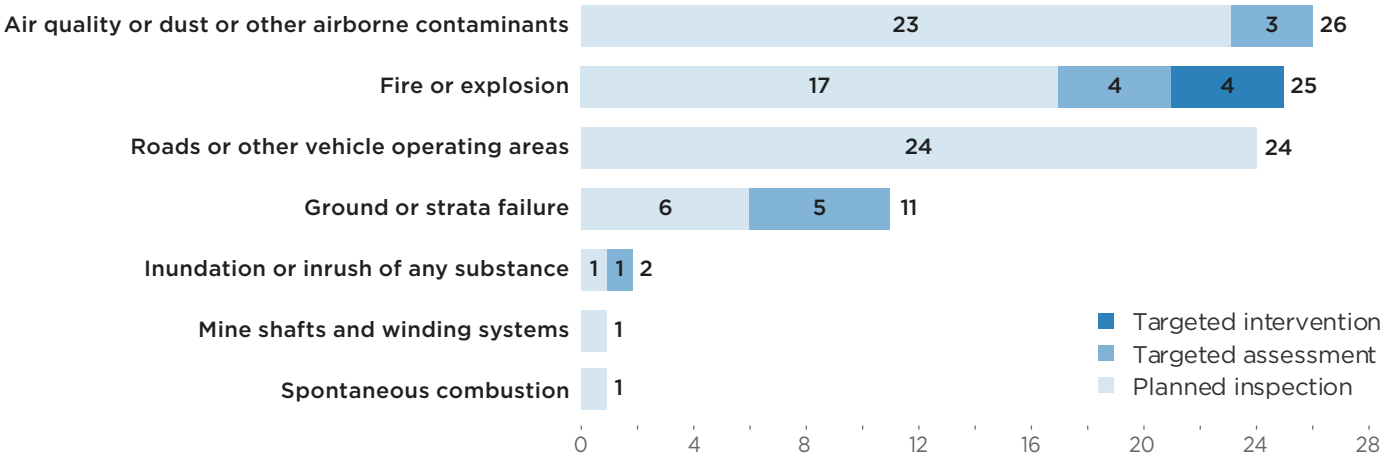
Reactive




| FROM 312 | FROM 127 | | FROM 88 | FROM 65 | FROM 1 | FROM 95 |
|---|---|---|---|---|---|---|
| **298** | **111** | **225** FROM 215 | **60** | **26** | **0** | **87** |
| COAL MINES | LARGE MINES | SMALL MINES | PETROLEUM AND GEOTHERMAL SITES | OPAL MINES | EXPLORATION SITES | NON-MINES |

## **Programmed site assessments** conducted




**599 notices issued**

**384** WHSA s191 improvement notices

**5** WHSA s198 non-disturbance notice

**171** WHS(MPS)A s23 notices of concerns

**39** WHSA s195 prohibition notices

**For more information** and performance metrics on the New South Wales mining industry visit our website resourcesregulator.nsw.gov.au

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# 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.

The following list includes safety alerts (including fatalities) and bulletins that occurred between **January to March 2021**.

The incidents selected were based on their relevance to equipment and processes commonly used across the NSW mining industry.

## Fatal injuries

### Australia

#### NEW SOUTH WALES

There was no mine or quarry-related fatalities reported this quarter.

#### OTHER STATES

**Queensland**

There was no mine or quarry-related fatalities reported this quarter.

**Western Australia**

There was no mine or quarry-related fatalities reported this quarter.

**Victoria**

There was one fatality reported in this quarter.

On 17 February 2021, a 35-year-old worker sustained fatal injuries after a fuel tank exploded. It is believed the man was using an electric grinder to cut into the tank when fuel vapour ignited, causing the explosion. WorkSafe are investigating. For more information refer to the safety alert.

# International

### UNITED STATES OF AMERICA

There were seven mining or quarry related fatalities published by United States of America's, Mine Safety and Health Administration (MSHA), during the quarter:

- On 16 January 2021, a 47-year-old drill operator with seven years of mining experience, died as a result of injuries he suffered when the "J wrench" he was using to remove a down hole drill from the drill steel moved unexpectedly, crushing his right thigh between the J wrench and the drill mast. For more information refer to the final report.
- On 19 January 2021, a 39-year-old miner with 15 years mining experience, working at a sand and gravel pit, reversed a haul truck to the edge of a dump point. The embankment had been steepened by a loader during works to remove material at the bottom of the slope. When the edge of the embankment failed, the haul truck travelled backwards and overturned, landing on the roof of the cab. The haul truck driver was fatally injured. For more information refer to the preliminary report.
- On 8 February 2021, a 38-year-old miner was fatally injured while working in the prep plant at a limestone mine. With less than one years' experience, he became entangled in an operating fluted tail pulley while shovelling material from beneath an adjacent fluted tail pulley. For more information refer to the preliminary report.
- On 22 February 2021, a 26-year-old underground chute puller, with five years mining experience was fatally injured at a lead and zinc mine. While travelling as a passenger of a rail-mounted locomotive, he was crushed between the deck of the locomotive and an overhead chute. For more information refer to the preliminary report.
- On 25 February 2021, a 26-year old plant operator, with three years mining experience, died after entering a cyclone discharge box. The local fire department recovered the victim lodged in an 18-inch wide discharge pipe that was full of water. For more information refer to the preliminary report.
- On 5 March 2021, a 63 -year-old miner with over 40 years' experience mining, was fatally injured when the excavator he was operating rolled over into a body of water. The worker was operating the machine along an elevated roadway running adjacent to the dredge pond. The ground under the track on one side of the excavator sloughed off and the excavator overturned, falling and then sliding approximately 13 foot into the pond. For more information refer to the preliminary report.
- On 12 March 2021, a 35-year-old miner with more than eight years' mining experience was fatally injured while attempting to insert a steel pin into a spud beam. The pin was partially inserted into the collar of the hole as the spud continued to lower into the spud well. The victim was struck in the face by the cantilever action of the safety pin. For more information refer to the preliminary report.

# Other serious injuries

- **(VICTORIA)** Worker's arm severed - While trying to align a conveyor belt, a worker was drawn into a dangerous nip point, seriously injuring their arm. The worker was able to access the operating conveyor, because of inadequate guarding, but was unable to reach an emergency stop device. For more information refer to the safety alert.
- **(NEW SOUTH WALES)** Loader drives over stop edge - A worker sustained critical injuries after inadvertently driving a Caterpillar R2900 LHD off the edge of a stope and falling 20 metres to the level below. The dirt bund was completely knocked over by the LHD in the incident. For more information refer to the safety alert 21-04.
- **(NEW SOUTH WALES)** Worker pinned by continuous miner - A mine worker was in the process of picking up a feeder cable behind a moving Joy 12CM wide head continuous miner (the miner) when his upper body became pinned between the boom of the miner and the rib. The worker sustained serious internal injuries, arm and rib fractures. For more information refer to the investigation information release 21-03.
- **(NEW SOUTH WALES)** Worker injured by failed components - A worker, standing underneath a hopper of a mobile jaw crusher, was struck on the ear by failed components whilst using a chain assembly. For more information refer to the investigation information release 21-04.
- **(NEW SOUTH WALES)** Worker's leg fractured - A bucket attachment pin from a PC1250 excavator bucket was being removed as part of a bucket change out. While assisting in this task, a worker was struck by the pin as it was ejected resulting in a compound fracture to his right lower leg. For more information refer to the investigation information release 21-05.
- (**WESTERN AUSTRALIA)** Radiator blades seriously injure mechanics hand - A service mechanic had just completed a general service of a 300 kVA generator, de-isolated it and bought it back online. He then conducted post service inspection and clean up, including wiping oil and grease marks with a rag. When the mechanic leaned into the generator enclosure, with the rag in his hand, it appears the rag and hand were drawn into the rotating radiator fan blades, causing serious injuries. For more information refer to the significant incident report #284.
- **(WESTERN AUSTRALIA)** Hazards associated with use of e-cigarette devices - There was a report of an incident where an electronic cigarette battery spontaneously ignited in a worker's pocket while he was travelling in a ute with two other workers. For more information refer to the mines safety bulletin #181.

# Safety alerts, bulletins and other dangerous or high potential incidents

- **(QUEENSLAND)** Rockfall injures jumbo operator - A jumbo operator suffered a serious injury (broken rib) when he was struck by a rock that fell from the back (roof) of unsupported ground of an incline. The rock was deflected by partially installed steel mesh, back into and beneath supported ground, where he was inspecting a hydraulic leak on one of the booms of the jumbo. For more information refer to the safety alert #385.
- **(NEW ZEALAND)** Rockfall damages excavator - While an excavator was working at the toe of a bench, a rock fell out of the face hitting the excavator. The excavator was damaged, but no injuries were sustained by the operator. For more information refer to the safety alert.
- **(VICTORIA)** Plant rollovers in quarries - In recent months, WorkSafe have been notified of several incidents involving mobile plant rollovers at quarries. The rollovers reported involved a bulldozer, drill rig, water cart and trucks. The truck rollovers occurred during tipping activities. For more information refer to the safety alert.
- **(NEW ZEALAND)** Loader collides with light vehicle - A contractor's light vehicle was parked next to an aggregate stockpile, facing away from a loader. The loader got a call to load a truck and trailer from an adjoining stockpile and, as he reversed, the loader collided with the contractor's light vehicle. For more information refer to the safety alert.
- **(QUEENSLAND)** AC causes explosion - A mine worker was driving a truck in an underground mine when an explosion in the truck's cabin caused serious burns to the worker's face, hands and chest. Fortunately, the workers eyes were protected from the blast by safety glasses. For more information refer to the safety alert #384.
- **(QUEENSLAND)** Fire on drill rig - A serious accident occurred while a worker was adjusting the compressed air delivery system on a UDR 1000 RC drill rig. The drill rig was engulfed in fire causing serious burns to the workers face, arm, chest and back. Fortunately, the worker's eyes were protected from the fire by safety glasses. For more information refer to the safety alert #388.
- **(WESTERN AUSTRALIA)** Near miss during lifting operation –A davit crane was being used to lift a mini excavator when the lift points welded to the excavator failed. The excavator fell approximately ten metres down a crusher vault, missing two workers in the area. For more information refer to the significant incident report #285.
- **(QUEENSLAND)** Emergency battery packs deformation - Coolon lighting and solutions have become aware of a potential safety issue with some of their emergency battery units or emergency battery packs (EMP's). For more information refer to the petroleum and gas safety alert #97.

- **(QUEENSLAND)** Power failure leads to collision - A Komatsu 930E-2 rear dump truck ascending a ramp incurred a fault and lost all power and propulsion, coming to a complete standstill on the ramp. The operator exited the cabin and descended to ground level to reset a battery isolator. When the operator stepped off the access ladder the rear dump truck began to roll backwards. It gained speed, travelling an estimated distance of 200 metres down the ramp and came to rest on a bund. A grader and another rear dump truck had to take evasive action. For more information refer to the safety alert #386.
- **(QUEENSLAND)** Mesh walkway failures - Coal mine workers have fallen through mesh walkways and platforms in recent incidents. In both instances the workers required medical treatment and the potential existed for injuries to have been far more serious. For more information refer to the safety bulletin #193.
- **(QUEENSLAND)** Tyre explosion following lightning strike - A coal mine worker in the crib hut for the pre-start meeting saw lightning strike a truck in the park-up area. Shortly afterwards, the position five tyre on the truck exploded. For more information refer to the safety alert #383.
- **(QUEENSLAND)** Overheating potential - Operators of underground coal mines should be aware of the capability of polyurethane resins (PUR) to cause heating of coal due to exothermic reaction. It is essential that effective risk control measures are implemented when PUR is used in underground mining operations for the purpose of strata consolidation. For more information refer to the safety alert #387.
- **(VICTORIA)** Soft sling failures - Several soft sling failures in workplaces have occurred recently, resulting in life threatening injuries and serious near misses. Incorrect use of soft slings (also known as synthetic fibre slings) can result in the sudden failure of a sling, even when the load being lifted is below the working load limit of the sling. For more information refer to the safety alert.
- **(NEW SOUTH WALES)** Jumbo hit by loader - A Caterpillar R2900G underground loader contacted the rear of a stationary Atlas Copco jumbo while turning into an access drive. There were no injuries sustained by either worker. Damage was caused to the rear of the jumbo and it was taken out of service for inspection and repairs. For more information refer to the safety alert 21-03.
- **(NEW SOUTH WALES)** Haul truck collides with wash bay - An unattended CAT793D haul truck rolled 65-metres from the workshop designated parking line and collided with a pump and infrastructure at the wash bay. For more information refer to the safety alert 21-02.

- **(NEW SOUTH WALES)** Elevated work box falls from integrated tool carrier - A work box detached and fell two metres from an integrated tool carrier (IT). The work box hit the ground and rolled 90 degrees onto its side. Two mine workers located in the work box, were partially ejected from the work box and suffered minor injuries. For more information refer to the safety alert 21-01.
- **(WESTERN AUSTRALIA)** Competency of spotters during mobile load shifting operations - Spotters can be an effective control for reducing the risk of inadvertent impact by operators of mobile load shifting equipment. It is important that they have the necessary knowledge, skills and experience to do so competently. For more information refer to the mines safety bulletin #182.
- **(NEW ZEALAND)** Worker sprayed with battery acid - A contractor's excavator was found to have a dead battery. This was plugged into a RAPID 480 charger/starter. After being on charge, the battery exploded, spraying battery acid onto the operator. The operator had correct PPE and was not seriously injured. For more information refer to the safety alert.
- **(UNITED KINGDOM)** Stored energy injures worker - A conveyor belt contractor working onboard a UK marine aggregate dredger was struck in the face by a chain under tension, while engaged in turning the longitudinal belt, which had flipped during operation. For more information refer to the safety alert.
- **(UNITED KINGDOM)** Close inspection of shovel loader identifies serious fault in rim - During an inspection carried out by an engineer on a Komatsu WA 320 Loading Shovel at an asphalt plant, it was noted that there was a crack travelling from the holes of each wheel stud. At first glance, it looked like the paint work had cracked, but after cleaning the area with a pressure washer and upon closer inspection, it was confirmed that this was a crack in the rim itself. For more information refer to the safety alert.

# Notifiable incidents relating to hazards

The Work Health and Safety (Mine and Petroleum Sites) Regulation 2014 (the regulation) identifies principal hazards and principal control plans for special consideration.

Principal hazards have a reasonable potential to result in multiple deaths in a single incident or a series of recurring incidents.

Principal control plans cover risks to health and safety from hazards, work processes and plant that may result in incidents that are high potential, frequently occurring or of a certain complexity.

## SUMMARY OF INCIDENTS

The following table shows the number of incident notifications received for the past five quarters as classified against a principal hazard or principal control plan.

Overall, there were 471 incident notifications received in the current quarter. Of these, 40% (186) related to principal hazards, 27% (126) related to principal control plans and the remainder related to other incidents.

**TABLE 1.** INCIDENT NOTIFICATIONS CLASSIFIED BY PRINCIPAL HAZARD/PRINCIPAL CONTROL PLAN JAN 2020 TO MAR 2021

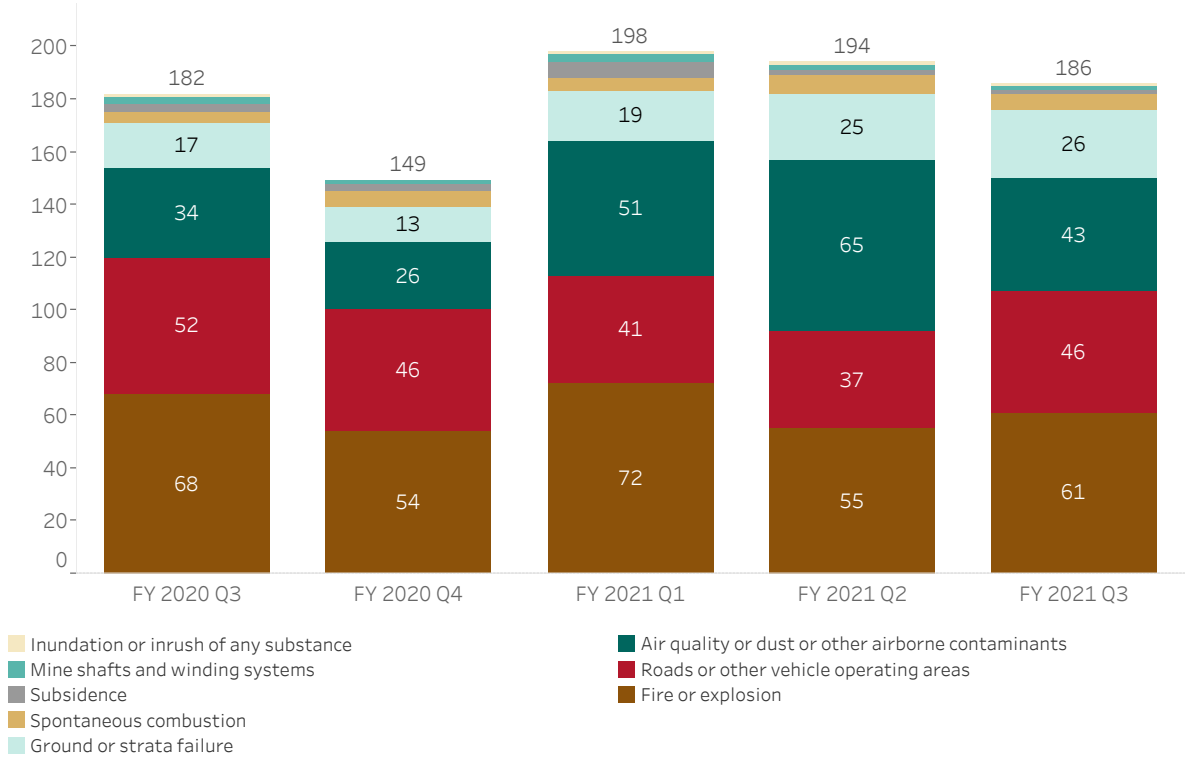
| INCIDENT CLASSIFICATION BY PRINCIPAL HAZARD OR PRINCIPAL CONTROL PLAN | | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 | FY 2021 Q3 | LAST 12 MONTHS |
|---|---|---|---|---|---|---|---|
| Principal hazard | Air quality or dust or other airborne contaminants | 34 | 26 | 51 | 65 | 43 | 219 |
| | Fire or explosion | 68 | 54 | 72 | 55 | 61 | 310 |
| | Gas outbursts | | | | | | 0 |
| | Ground or strata failure | 17 | 13 | 19 | 25 | 26 | 100 |
| | Inundation or inrush of any substance | 1 | | 1 | 1 | 1 | 4 |
| | Mine shafts and winding systems | 3 | 1 | 3 | 2 | 2 | 11 |
| | Roads or other vehicle operating areas | 52 | 46 | 41 | 37 | 46 | 222 |
| | Spontaneous combustion | 4 | 6 | 5 | 7 | 6 | 28 |
| | Subsidence | 3 | 3 | 6 | 2 | 1 | 15 |
| | Total | 182 | 149 | 198 | 194 | 186 | 909 |
| Principal control plan | Electrical Engineering Control Plan | 24 | 23 | 27 | 16 | 22 | 112 |
| | Electrical and/or Mechanical Engineering Control Plan | 51 | 51 | 56 | 44 | 39 | 241 |
| | Explosives Control Plan | 13 | 24 | 23 | 28 | 18 | 106 |
| | Mechanical Engineering Control Plan | 78 | 55 | 62 | 42 | 42 | 279 |
| | Ventilation Control Plan | 3 | 2 | 5 | 5 | 5 | 20 |
| | Total | 169 | 155 | 173 | 135 | 126 | 758 |
| Other | Not applicable | 175 | 175 | 220 | 190 | 159 | 919 |
| **GRAND TOTAL** | | **526** | **479** | **591** | **519** | **471** | **2,586** |

# Principal mining hazards

- GROUND OR STRATA FAILURE
- INUNDATION OR INRUSH OF ANY SUBSTANCE
- MINE SHAFTS AND WINDING SYSTEMS
- ROADS OR OTHER VEHICLE OPERATING AREAS
- AIRBORNE DUST AND OTHER AIRBORNE CONTAMINANTS
- FIRE OR EXPLOSION
- GAS OUTBURSTS
- SPONTANEOUS COMBUSTION
- SUBSIDENCE
- (HAZARDS IDENTIFIED BY THE MINE OPERATOR) PROHIBITED ITEMS OR SUBSTANCES

The chart below presents a further breakdown of numbers of incidents notifications received by quarter related to principal hazards as defined in clause 5 of the Regulation.

**FIGURE 1.** INCIDENT NOTIFICATIONS RECEIVED BY PRINCIPAL HAZARD JANUARY 2020 TO MARCH 2021

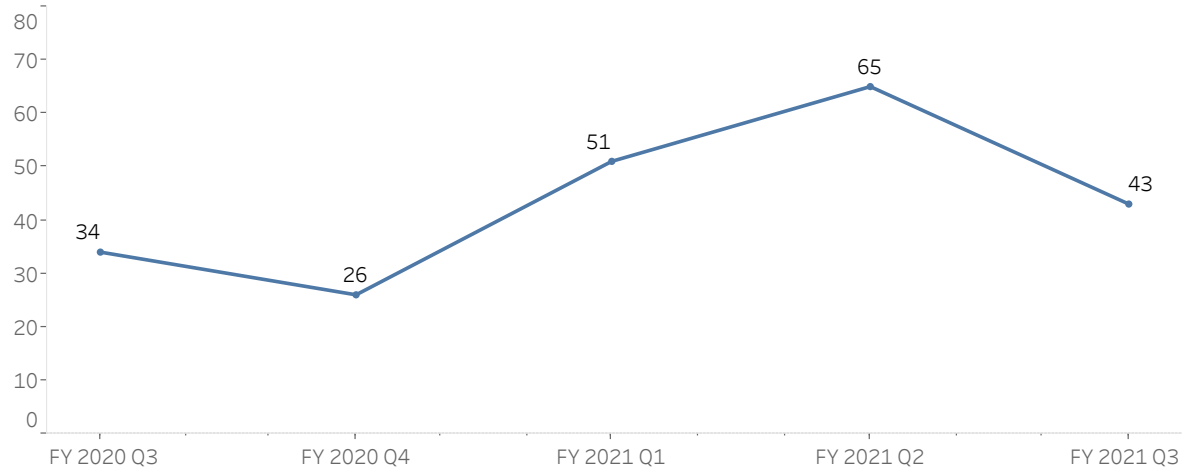


FROM 66
43

## 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/silica dust).

**FIGURE 2.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD AIR QUALITY, DUST OR OTHER AIRBORNE CONTAMINANTS JANUARY 2020 TO MARCH 2021




### HIGH POTENTIAL INCIDENT – CONDITIONS LEAD TO HIGH MONITORING RESULTS

Recently, a quarry (sand pit) undertook respirable dust monitoring on a day when the environmental conditions were particularly windy and dry. The monitoring results came back with high quartz concentration (0.12 mg/m$^3$) which is above the limit of 0.05 mg/m$^3$.

**Response from the mine**

- Purchase of an anemometer to help identify high risk wind conditions
- 3000-litre water trailer on standby for watering down material and road
- Maintenance of sealed doors on operating machinery
- Requirement to always wear dust masks around processing and extraction areas

**Recommendations to industry**

Operators must consider the following when developing control measures to manage the risks of air quality or dust or other airborne contaminants:

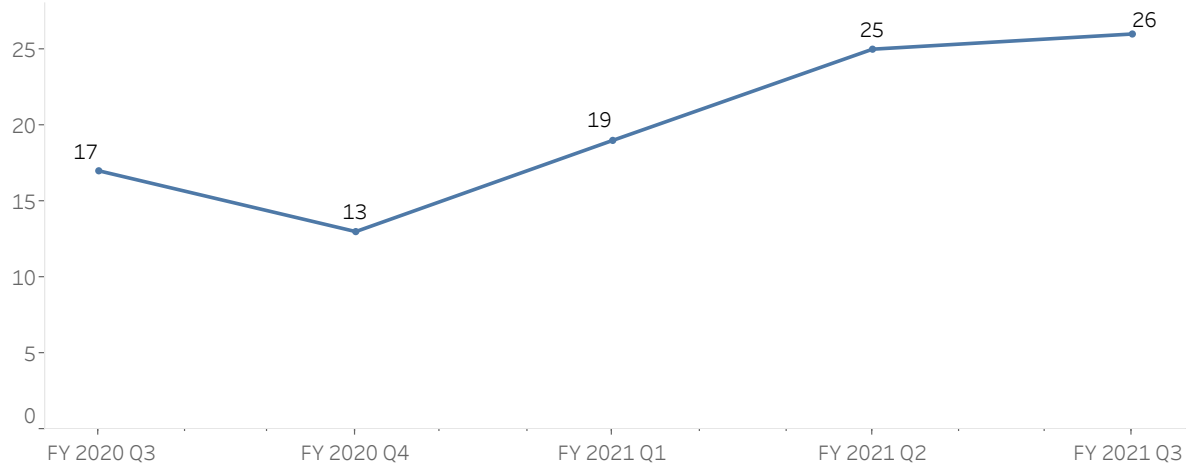
- the temperature and humidity of the air
- the length of exposure, with regard to extended shifts and reduced recovery periods.

## Ground or strata failure

26
FROM 25

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.

**FIGURE 3.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD GROUND OR STRATA FAILURE JANUARY 2021 TO MARCH 2021




### DANGEROUS INCIDENT – EXCAVATOR DAMAGED BY WALL SECTION FALL

An excavator, tasked with building a ramp into the pit, was widening the area when a section of wall (topsoil and sand), approximately five metres high, has fallen out and smashed through the window on the excavator door allowing glass and soil into the cab to approximately ankle level. No one was injured.

Operators must have safe systems of work in place to inspect highwalls, low-walls and dumps. These inspections must consider weathering effects, ground water and conditions that affect stability.

Following several incidents where people and equipment have been exposed to significant health and safety risks as a result of highwalls, low-walls and dumps failing, we published Safety Bulletin SB20-01 Failure of highwalls, low-walls and dumps.

Operators should take note of the recommendations in this bulletin.

### DANGEROUS INCIDENT – ROOF FALL BLOCKS ROAD

A roof fall occurred at an intersection in an underground coal mine. The fall was in an out-bye area of the mine and extended into the cut-through, blocking the travel road. All personnel were safely evacuated and there were no injuries.

This incident is under investigation and further information may be published in the future.

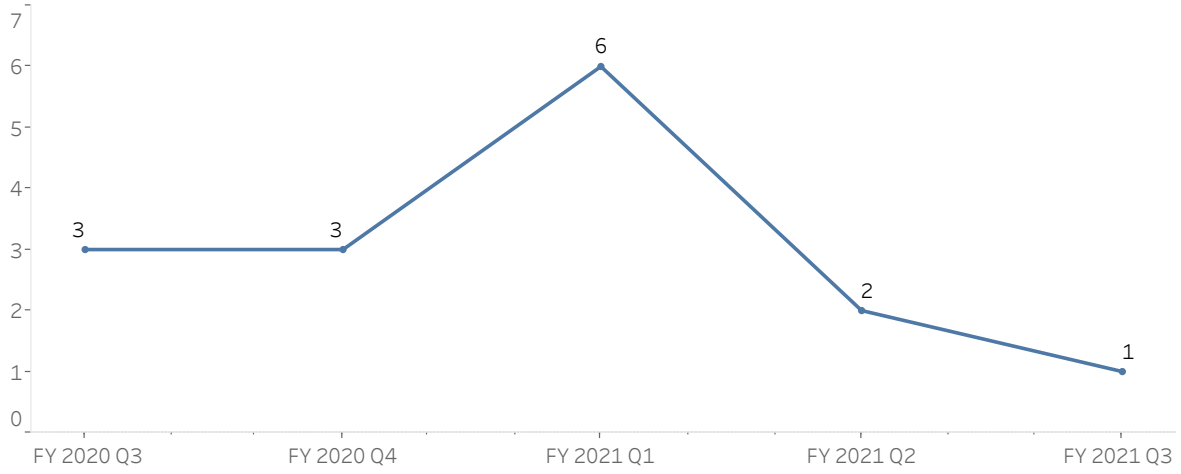
### Recommendations to industry

- Underground mines should review the adequacy of their strata monitoring arrangements and associated trigger action response plans, to ensure that workers are not exposed to unacceptable risks associated with strata failure. For more information refer to the NSW code of practice: Strata control in underground coal mines


## Subsidence

Subsidence hazards are 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.

**FIGURE 4.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD SUBSIDENCE JANUARY 2020 TO MARCH 2021




### HIGH POTENTIAL INCIDENT – RAINFALL DISLODGES CLAY AND ROCK, CLOSING TOURIST MINE

During routine daily inspections at a tourist mine, a significant sediment slip was identified. The material that had fallen was predominately clay, as well as one notable rock from a low height on the side of a cave wall.

The collapse was a result of heavy rainfall over the previous 24-hour period, with over 80mm recorded. The slip occurred overnight whilst the mine was closed. The mine remained closed until safe access and cleaning could occur.

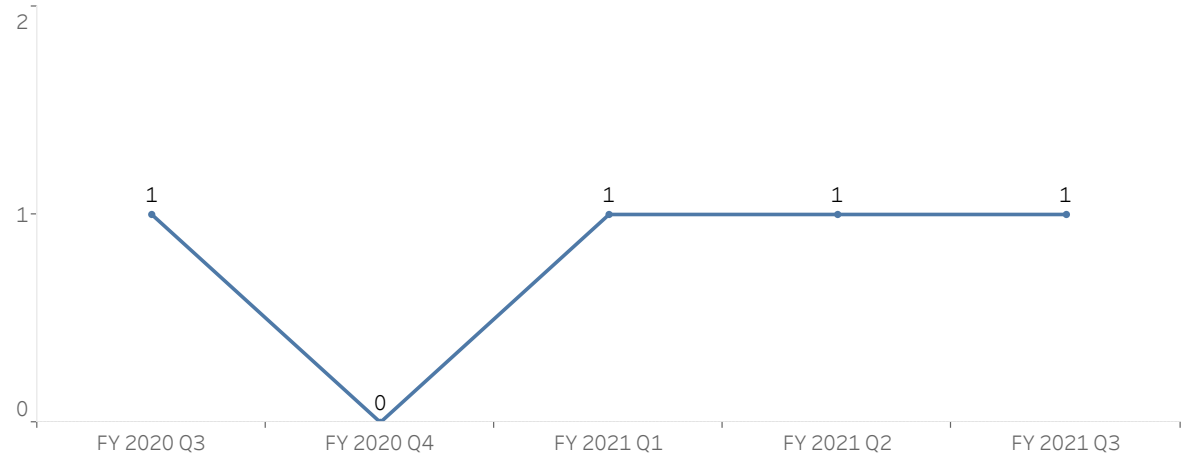
A trigger action response plan and the mine's work health and safety policy state that if more than 60mm of rain in 24 hours or 80mm over three consecutive days occurs, mine closure is triggered. Subsequent tours were cancelled and the mine closed due to forecasted rainfall.

NO CHANGE
1

## 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.

**FIGURE 5.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD INUNDATION OR INRUSH JANUARY 2020 TO MARCH 2021




### HIGH POTENTIAL INCIDENT – PREPARATION AND PLANNING MITIGATE INCIDENT

Following heavy rain in the area, the Shoalhaven River began to rise. As expected, the river rose significantly, which resulted in an inundation of floodwater to break through, over the quarry wall.  All production was halted.

As part of the trigger action response plan, the quarry operators took precautions to prevent damage to equipment and loss of material, by quickly moving to higher ground.

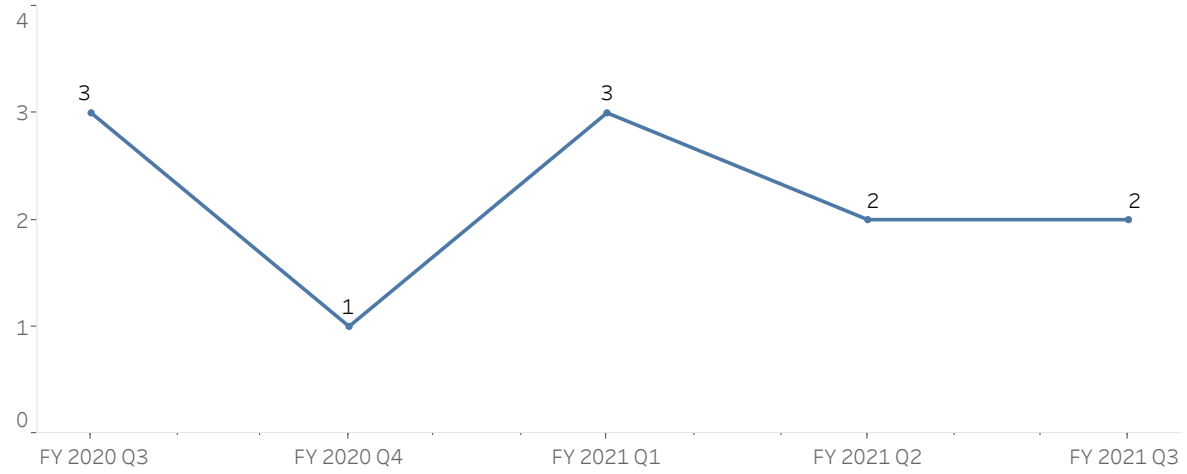
There was no pollution to the environment or damage to equipment.

NO CHANGE
2

## 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.

**FIGURE 6.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD MINE SHAFTS AND WINDING SYSTEMS JANUARY 2020 TO MARCH 2021




### DANGEROUS INCIDENT – UNPLANNED MOVEMENT OF DRIFT WINDER

A winder rope kinked approximately eight metres from the man car attachment point. The man car operator noticed the rope kink and the build-up of mud and dirt on the rope during operations.

From the primary investigation it was identified that the rope may have been run over by a vehicle with rubber tyres.

**Recommendations to industry**

- Mine's operating winders should have exclusion zones clearly defined
- Workers must report damage to plant and equipment when it occurs

### DANGEROUS INCIDENT – CHEESE WEIGHT FALLS

A loader operator who was cleaning the bottom of a shaft discovered a cheese weight had fallen from a friction winder. Approximately 80% of the cheese weight fell from a cage guide rope.

**Mine operators should**

- Ensure that stringent monitoring and quality control of maintenance and repair activities is undertaken on winders
- Ensure enough time and resourcing is allocated for maintenance and repair tasks

NO CHANGE
0

## Gas outbursts

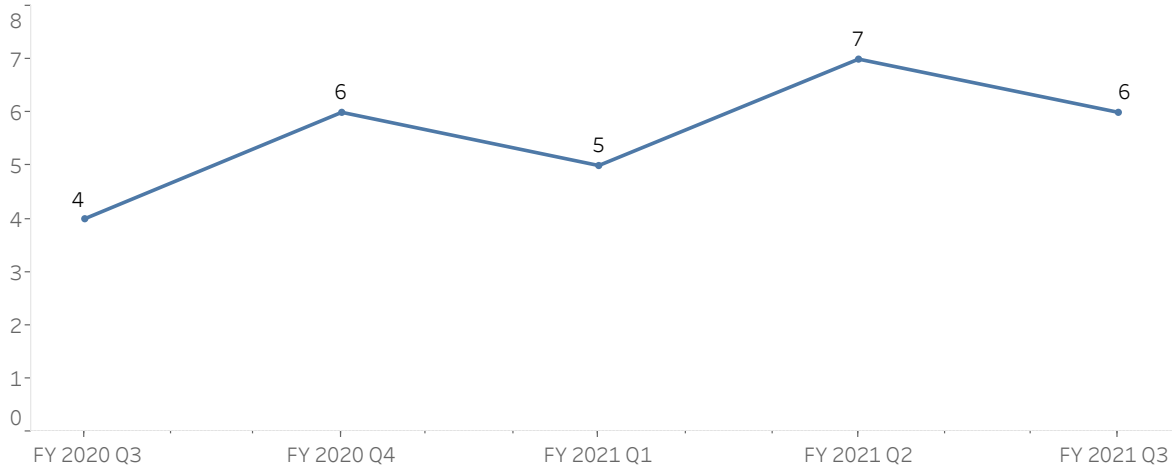
Gas outbursts are not a high frequency hazard event but their often sudden and violent nature has the potential to cause fatalities to workers nearby. This hazard also includes the liberation of gases that can asphyxiate, explode or cause a fire. These circumstances make this a principal hazard in NSW.

FROM 7
6

## Spontaneous combustion

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

**FIGURE 7.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD SPONTANEOUS COMBUSTION JANUARY 2020 TO MARCH 2021




### HIGH POTENTIAL INCIDENT – SPONTANEOUS COMBUSTION IN STOCKPILE

An open cut coal mine workshop supervisor was conducting an inspection and noticed smoke coming from a coal stockpile. A production superintendent then conducted an inspection and identified small flames in a pocket of coal on the stockpile an area approximately one metre squared, with flames approximately 100mm high.

**Response from the mine**

- The workshop supervisor isolated the immediate area
- The production superintendent isolated the area of concern from the coal stockpile and capped and tracked rolled the area to eliminate oxygen from the source
- A heat gun was used every two hours to monitor the area of concern
- The stockpile was consumed over the next two months, eliminating further risk

### HIGH POTENTIAL INCIDENT – SPONTANEOUS COMBUSTION EVENT AFTER BLASTING

A spontaneous combustion event was observed on a muck pile at an open cut coal mine two days after it was blasted.

The event was believed to have originated from a dyke area with known geological features.

Events leading up to spontaneous combustion included:

- 8 February - six holes (at the south end of the pattern) were identified as having elevated ground temperatures (>50°c) during drilling. Temperature logging was used to monitor these holes and check the remainder of the drill pattern. Personal gas monitors were used by persons working in the area to monitor the atmosphere.
- 9 February - drilling was completed and loading began on the pattern in accordance with the documented procedure for elevated temperature ground.
- 12 February - loading was completed and the blast was fired (six holes in total were not loaded due to elevated temperatures).

**Response from the mine**

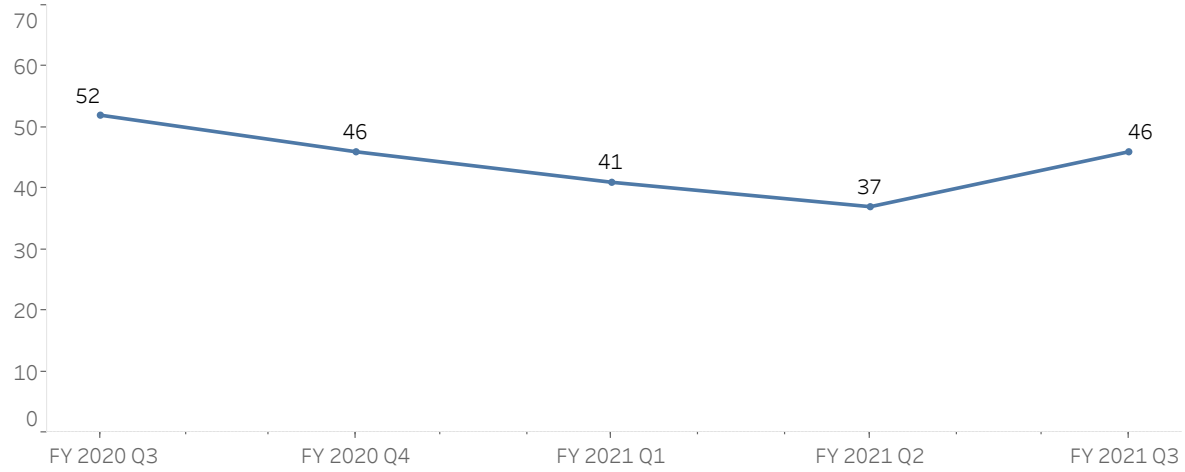
The mine implemented actions in accordance with their working in gaseous ground procedure, which included:

- working under a job hazard analysis
- regular temperature logging and use of gas monitors in the area
- smothering the area with material by dozer.


## Roads or other vehicle operating areas

Vehicle movements in and around mine sites, require 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.

**FIGURE 8.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD ROADS OR OTHER VEHICLE OPERATING AREAS JANUARY 2020 TO MARCH 2021




## DANGEROUS INCIDENT – TRUCK ROLLOVER

An operator driving a fully loaded dump truck at an open cut coal mine was descending a ramp when the truck veered into a windrow and rolled onto its side.

**Recommendations to industry**

- Mine operators should reinforce the application of procedures, including fatigue management, use of mobile phones and compliance with speed signs
- Equipment operators must maintain situational awareness and remain vigilant of the risk of machine rollovers
- This incident underpins the importance of wearing seatbelts as a mitigating control
- When planning tasks and travel paths, supervisors must consider rollover hazards

For more information refer to Safety Bulletin 17-01 Industry reports more truck rollover incidents.

## DANGEROUS INCIDENT – VISIBILITY NOT MAINTAINED IN DIRECTION OF TRAVEL

A coal mine worker was driving a ute that contacted the rib, catching the side of the vehicle on rib bolts.

Having stopped to fill up with water, the worker went back onto the main travel road setting the block light section to red. On entering the main travel road, the worker noticed lights in the distance further in-bye. As the worker was coming to the end of the block light section, he looked over his shoulder to see how far the

other vehicle was, deciding whether to change the block lights back to green. As the worker looked over his shoulder, he turned the ute into the rib, catching the rib bolts.

The driver avoided injury, but the front windscreen was smashed and the front vertical post was extensively damaged.

An investigation found restricted visibility (due to the tray-mounted crane) to be a contributor to the incident. The worker also took their eyes off the direction of travel for a significant amount of time and was travelling at an excessive speed.

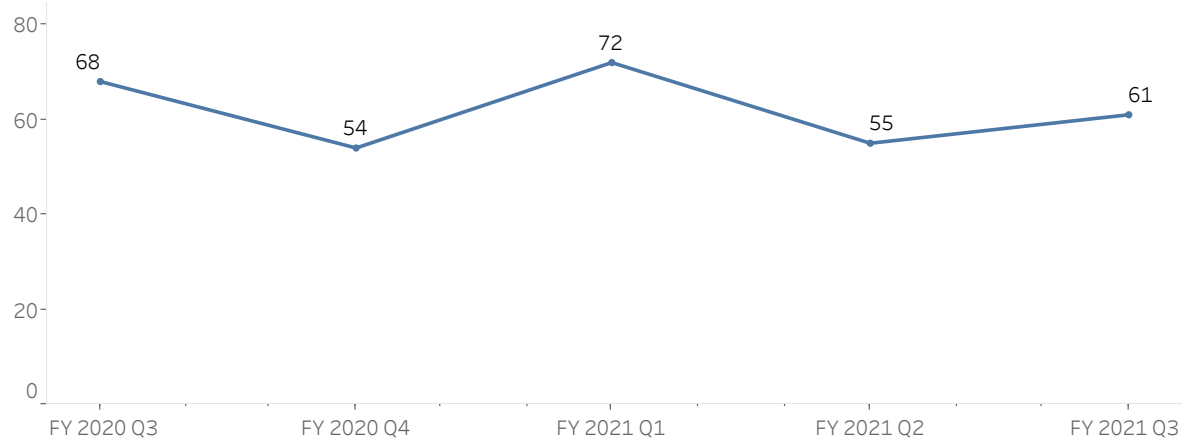
**Response from the mine**

- Fit rear view mirrors to all personnel transports
- Investigate the viability of installing a viewing window in the back of the ute to improve visibility
- Update and communicate principal hazard management plan to clarify use of block lights to reduce the need to turn around


## 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.

**FIGURE 9.** INCIDENT NOTIFICATIONS RELATED TO THE PRINCIPAL HAZARD FIRE OR EXPLOSION JANUARY 2020 TO MARCH 2021



## CONSOLIDATED REPORT RELEASED

A consolidated report has been published summarising the assessment findings from 23 mines in relation to the principal hazard of fire or explosion in the surface coal sector. View the full report for key findings and recommendations.

Consolidated report - Fire or explosion

## DANGEROUS INCIDENT – PORTABLE BATTERY EXPLODES

A fire occurred in an underground mine when a load haul dump ran over a battery-powered drill. The drill fell on the roadway after it was left on poly pipe.

Mine operators should review their safety management system to ensure the risks associated with the use of battery powered portable electrical apparatus have been addressed.

### Comments to industry

Risk assessments should consider:

- manufacturer's safety information
- suitability of battery charging equipment and location
- transport and storage of batteries
- suitability of the equipment for the environment
- control of batteries in underground parts of the mine and hazardous areas including permit systems, operator competency, chain of custody and transport and storage conditions
- inspection regimes and regimes for removing batteries from service and lost or damaged equipment.

## DANGEROUS INCIDENT – CONVEYOR BEARING FIRE

An idler bearing caught fire on a longwall conveyor out-bye of the boot end. The mine has identified that a bearing failed prematurely on one side of the idler, which caused the bearing lubricant to ignite due to heat from friction.

### Recommendations to industry

Mine operators are reminded of their obligations under clause 29 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014.

- Belt conveyors must be inspected by a competent person once every shift, and as soon as reasonably practicable after belt shutdown (to detect hazards such as the presence of overheating, smouldering or other condition likely to cause fire).
- Particular attention must be paid to high tension areas and areas of temporary misalignment for the premature failure of rollers.

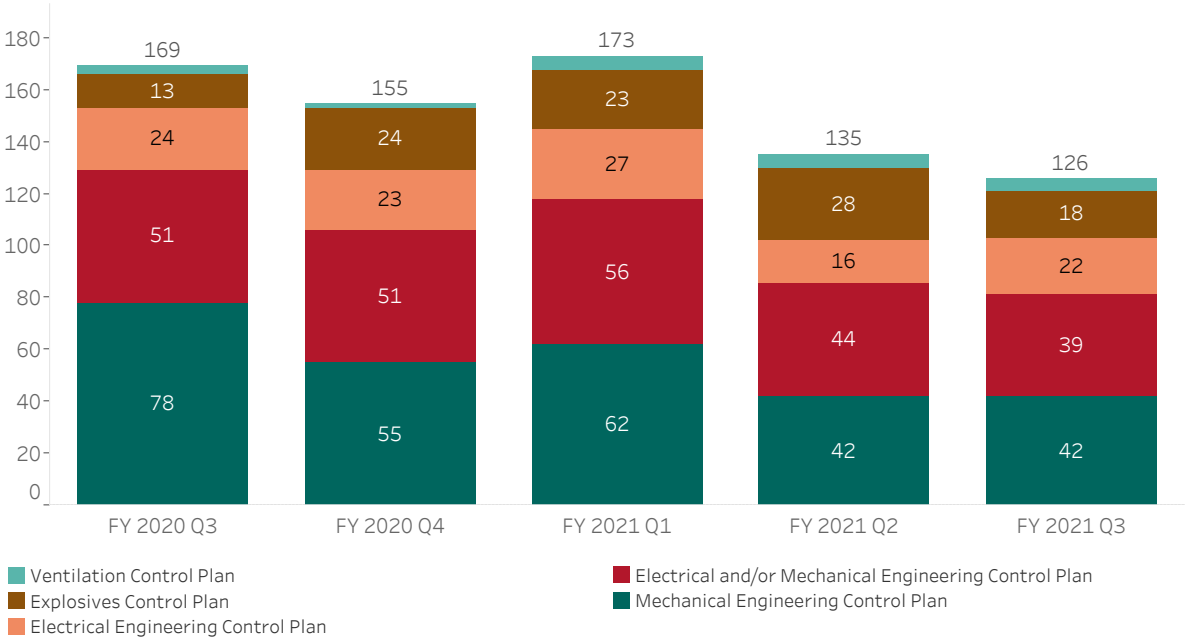
# Principal control plans

The Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 specifies principal control plans for managing certain risks associated with hazards at mine and petroleum sites.

There are seven principal control plans specified in the Regulation.

The figure below presents a further breakdown of numbers of incident notifications received related to principal control plans as defined in clauses 3 and 26 of the Regulation.

**FIGURE 10.** INCIDENT NOTIFICATIONS RECEIVED BY PRINCIPAL CONTROL PLAN JANUARY 2020 TO MARCH 2021

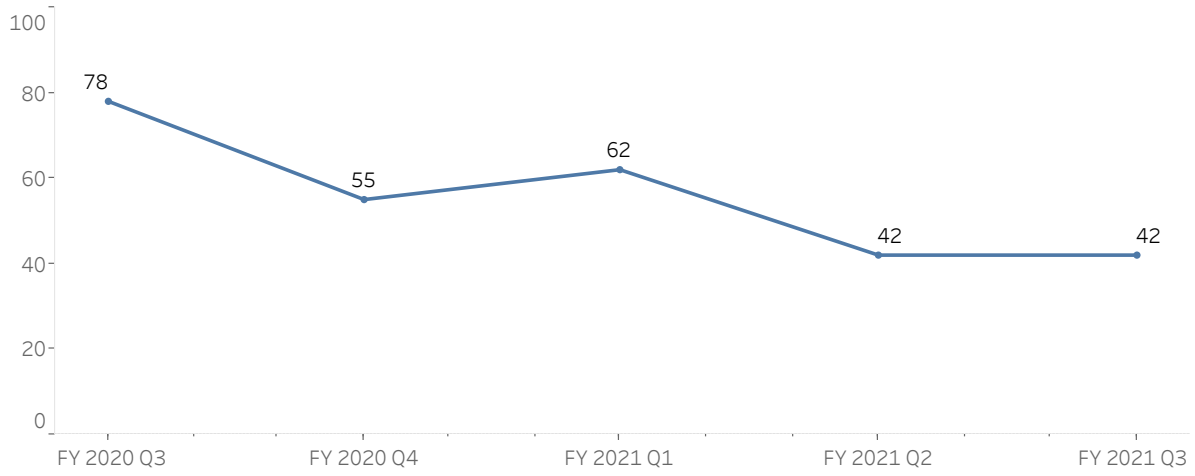


NO CHANGE
**42**

## Mechanical engineering control plan

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.

**FIGURE 11.** INCIDENT NOTIFICATIONS RELATED TO THE MECHANICAL ENGINEERING CONTROL PLAN JANUARY 2020 TO MARCH 2021




### HIGH POTENTIAL INCIDENT – COUPLING FAILURE LEADS TO FALL OF COMPONENTS

The main service airline at an open cut coal mine experienced a coupling failure, resulting in the steel coupling and the joining elbow to be ejected under pressure into the surrounding support structure (<100mm). It then fell from a height of approximately six metres to the screen level floor within the coal handling preparation plant (CHPP).

The coupling had a weight of approximately 1kg and the elbow approximately 1.8kg and the service air system typically operates around 100Psi (700Kpa). The coupling appears to have corroded to a point it could no longer support the pressure required to maintain the join. The flanged section that bolts the two halves together failed.

The area of the original failure and component ejection under pressure, is not an area accessible to people. The area where the components fell is accessible ordinarily to workers in the CHPP, however no one was in the area at the time of the incident.

**Response from the mine**

- Immediate inspection to confirm if there were any other couplings with significant similar deterioration and replacement of these as required
- Planned inspections to identify minor/moderate levels of corrosion on airline components
- Replacement of all components identified within the inspection report
- Annual maintenance strategy to inspect airline components

## HIGH POTENTIAL INCIDENT – LIGHT VEHICLE LOSES STEERING

A dual-cab light vehicle was being driven across a coal area. The driver attempted a three-point turn, to exit the single-lane access. First, the vehicle was reversed at full-lock, left-handed steer. Once this was completed, the driver stopped to engage first gear and turn the steering wheel to the right. Upon doing so, a noise was heard, and steering control of the vehicle was lost.

The vehicle was moved from the area and parked in a fundamentally safe position.

Upon inspection by the vehicle operators it was found to have a broken steering arm and was tagged out of service.

The incident was reported to the statutory mechanical engineer the next morning, who confirmed the failure of the steering linkage from the left-hand wheel attachment.

**Response from the mine**

- Communicate incident to all workers
- Implement replacement strategy of steering draglink assemblies (ball-stud joints, pitman arms and tie-rods) on this model of light vehicle operated by mine and based on previous failure history and OEM advice
- Trial of compatible and compliant aftermarket draglink assemblies on this model of light vehicle operated by mine
- Review draglink greasing frequency
- Address incomplete recording of kilometres driven by light vehicle users.
- Address poor adherence the vehicle's scheduled services regime by light vehicle users

**Comments to industry**

Mine operators are reminded that mechanical engineering control plans must take the following into account in determining the means by which the operator will manage the risks to health and safety from the mechanical aspects of plant and structures at the mine or petroleum site:

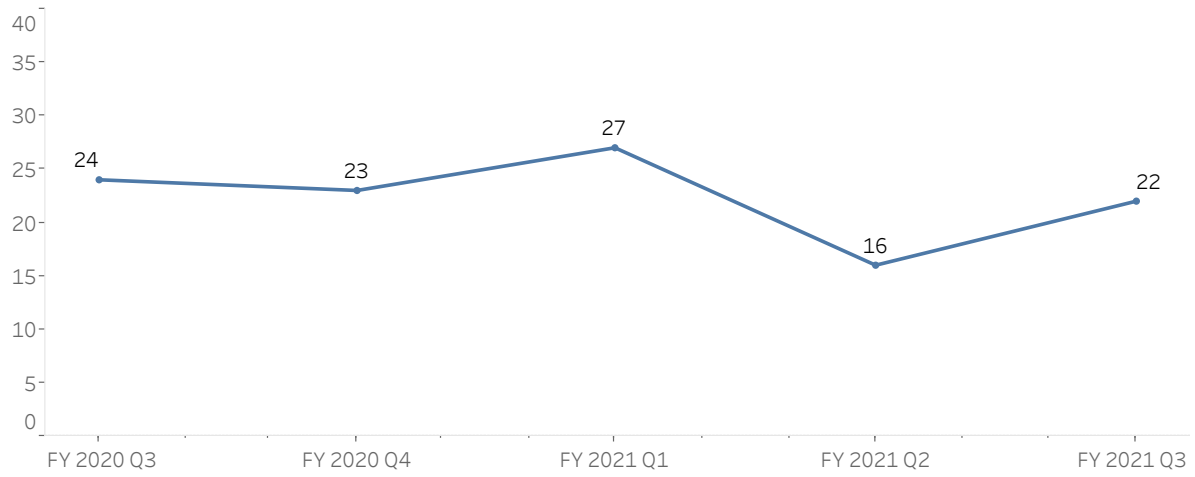
- the installation, commissioning, operation, maintenance, repair and alteration of plant or structures
- the overall life cycle of plant and structures at the mine or petroleum site
- the catastrophic failure of plant or structures.

## Electrical engineering control plan

22
FROM 16

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

**FIGURE 12.** INCIDENT NOTIFICATIONS RELATED TO THE ELECTRICAL ENGINEERING CONTROL PLAN JANUARY 2020 TO MARCH 2021




### STATE-WIDE BLITZ ON ELECTRICAL RISKS AT LARGE QUARRIES

During March 2021, operators of large quarries were visited by teams of inspectors.

A recent investigation into an electric shock at a quarry identified significant concerns regarding the testing, inspection and maintenance of electrical equipment. This compliance campaign assessed if quarry operators have identified and implemented appropriate controls in their electrical engineering control plan to protect the health of their workers from these risks. Refer to electrical safety blitz media release for further information.

### DANGEROUS INCIDENT – OUTDATED LOCAL CONTROL STATION CONTROL CIRCUIT LEADS TO SHOCK

A worker at a metal mine was attempting to start the pump of a surface concentrator, at a local control station. The local control station contained a push button start and E-stop button. The local control station is powered by 110V.

The worker used his left hand to push the start button but simultaneously and inadvertently, brushed a metal ring that was surrounding the E-stop. The worker's other arm was holding some nearby scaffolding. The mine worker felt a sensation that travelled up his arm to his elbow.

Site emergency personnel attended and the mine worker was transported to the local hospital.

**Response from the mine**

- Ensure all metallic glands are earthed
- Install a weather shield over the Local Control Station (LCS) enclosure
- Earth the metallic LCS enclosure using the earth core within the multicore control cable supplying the unit
- Verify the ingress protection integrity of replacement LCS unit and ensure it is installed in accordance with the manufacturer's recommendations
- Conduct insulation resistance and earth continuity testing to verify compliance with Australian Standards prior to re-energisation

**Comments to industry**

Mine operators are reminded that an electrical control plan must set out and consider the following matters when developing a control measure associated with electricity:

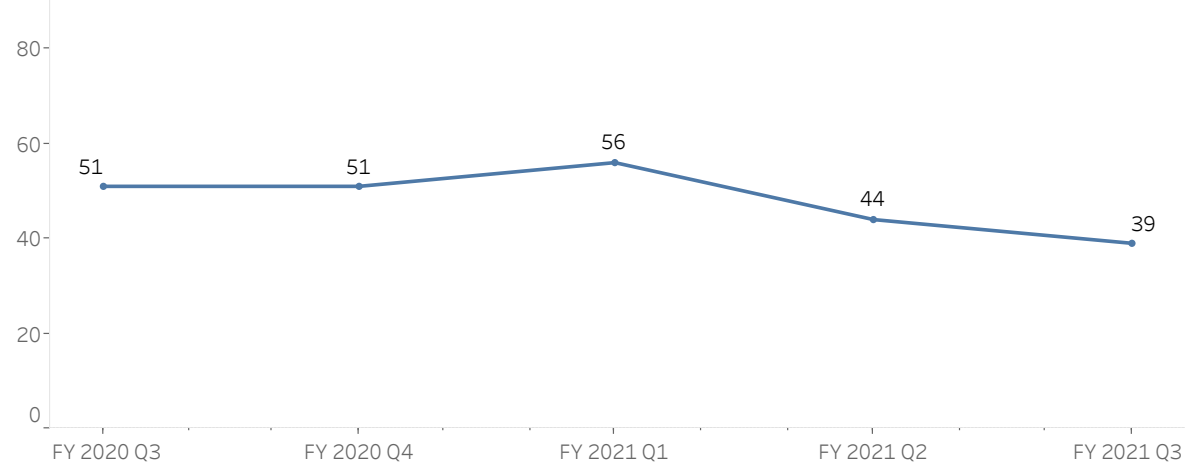
- the rating and design of plant for the prospective electrical fault level, electrical load, operating frequency, operating voltages and arc fault control
- the type of earthing system used, including levels of earth fault limitation
- the carrying out of the selection, installation and use of electrical cables and electrical cable accessories at the mine or petroleum site
- the need for reliable circuit interruption for all points in the electrical distribution system at the mine or petroleum site when faults occur taking into account the operating time and tripping current of circuit protection devices.

FROM 44
39

## Electrical and mechanical engineering control plans

Notified incidents may relate to both electrical and mechanical control plans.

**FIGURE 13.** INCIDENT NOTIFICATIONS RELATED TO THE ELECTRICAL AND/OR MECHANICAL CONTROL PLANS JANUARY 2020 TO MARCH 2021



## HIGH POTENTIAL INCIDENT – CABLE TRIP SHOWS EVIDENCE OF FIRE

Panel tradesmen were working on a Komatsu multibolter MB310, trying to determine why the pump was tripping on overload. During the investigation, the pump on the multibolter was started but tripped the power (this power trip was viewed as a short circuit trip at the panel load centre and at the panel supply transformer).

It was then noticed that the cable reel compartment had smoke. Power was isolated and the trailing cable removed from its load centre. The fitters then opened the cable reel compartment's inspection door and noticed a large gap in the circular flameproof slip ring enclosure cover.

The electrical leading hand was called and asked to bring a camera and investigation tools. Measurements of the flame path revealed a gap of 2.85mm on one side of the enclosure and 0.7mm on the opposite side. All bolts were tight to remove. Once the cover was removed it was noted that a short circuit had occurred within the slip rings. The inside of the cover was marked with pressure relief marks, which aligned with where the two oversized flame paths were. It was noted that the other two rectangular flameproof covers did not fail a 0.25mm feeler gauge when tested.

The cable reel was removed from the multibolter and sent to a registered workshop for further investigation.

**Response from the mine**

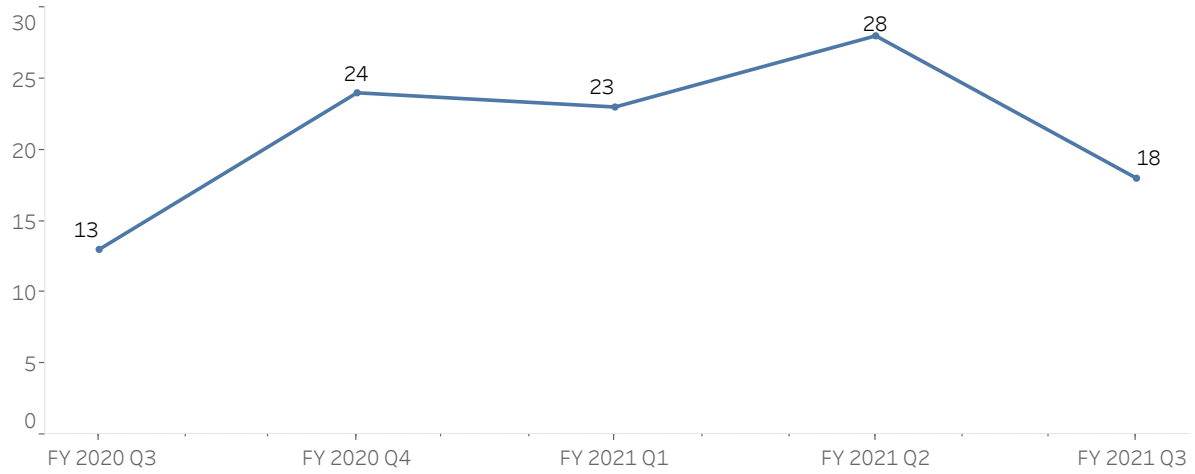
- The cable reel was sent to a registered workshop for failure assessment. The reel had been previously overhauled in November 2018.
- A review of maintenance tasks and inspections has occurred. It was found that an internal inspection of the multibolter and cable reel occurred in January 2021 with no defects being identified. External inspections have been conducted daily while the equipment was in service.
- The power reticulation network (feeder cables, trailing cables, load centre, transformer) has been inspected to assess for stressed, overheated connections.

FROM 28
18

## Explosives control plan

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'.

**FIGURE 14.** INCIDENT NOTIFICATIONS RELATED TO THE EXPLOSIVES CONTROL PLAN JANUARY 2020 TO MARCH 2021




### DANGEROUS INCIDENT – FLY ROCK LANDS NEAR OPERATING PLANT

Blasting of overburden at an open cut coal mine was being conducted. During the blasting, fly rock was ejected beyond the exclusion zone and into an area where mining plant was operating (excavator, truck, dozer). While there was some minor damage to the truck and excavator, no persons were injured.

It appears the fly rock dispersed from the base of the face holes contacting equipment located in the area working below a highwall, directly in front of the holes.

It was identified that insufficient information was provided to the shotfirers on the amount of burden at the bottom of the drill hole against the edge of shot.

A notice was issued prohibiting the firing of blast holes where workers are located within a 1000 metre exclusion zone of the blast.

**Comments to industry**

Operators are reminded that an explosives control plan must set out the control measures for risks to health and safety associated with explosives at the mine or petroleum site by considering:

- the characteristics of relevant explosives and the purposes for which they are to be used
- the characteristics of the places in which the explosives are to be used
- the potential for the ejection of fly rock or other material as a result of the detonation of an explosive.

## THEFT OR LOSS OF EXPLOSIVES – DETONATOR UNACCOUNTED FOR

At the completion of the day's loading on a blast pattern at an open cut coal mine, it was identified that a detonator was unaccounted for.

### Recommendations to industry

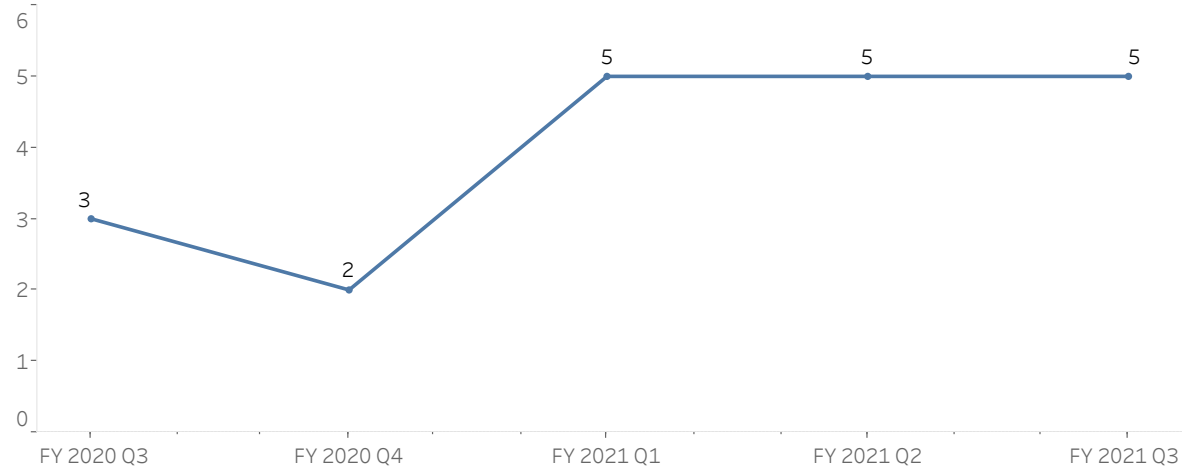
- Ensure that the explosives control plan sets out control measures for risks to health and safety associated with explosives considers the potential for theft of misuse.
- Ensure that the explosives control plan sets out procedures for the accounting of explosives at the mine site.
- Ensure that the explosives control plan sets out arrangements for keeping a register of persons who are licensed (to use, handle, transport and store) under the *Explosives Act 2003*.

## Ventilation control plan

NO CHANGE
**5**

A ventilation control plan covers risks associated with ventilation in underground mines. This includes incidents involving failed atmospheric conditions and where trigger action response plans may have been activated.

**FIGURE 15.** INCIDENT NOTIFICATIONS RELATED TO VENTILATION CONTROL PLANS JANUARY 2020 TO MARCH 2021




### DANGEROUS INCIDENT – POWER SUPPLY OUTS MAIN VENTILATION FAN

An underground metal mine lost electricity supply, resulting in a loss of the main ventilation system for the underground workings. The source of the supply loss was a feed break with the local energy provider.

The mine's ventilation design still enabled natural ventilation to flow during a short-term, main ventilation fan shut down. There was no requirement to evacuate workers.

**Recommendations to industry**

- Ensure communication with local supply authority to communicate time frames of any outages and supply reset.
- Ensure a trigger action response plan is in place so that immediate action is taken to supply adequate ventilated air to impacted parts of the mine as soon as possible.

### HIGH POTENTIAL INCIDENT – UNINTERRUPTIBLE POWER SUPPLY FAILS

The power supply tripped at a metalliferous mine, resulting in loss of primary ventilation and the precautionary evacuation of workers to emergency refuge bays.

Whilst electricians were undertaking work on the surface substation, work that required shutting a circuit breaker and should not have affected power, the uninterruptible power source (UPS) did not hold, resulting in the substation dropping out and loss of power to primary ventilation system.

No workers were in immediate or imminent risk of harm.

**Response from the mine**

- Complete circuit redesign and upgrade, with flag relay replacement
- Batteries to the UPS were replaced

Operators should note that the ventilation control plan for the mine must specify the minimum quantity of ventilated air required for each part of the mine for power to continue to be supplied to that part of the mine.

### HIGH POTENTIAL INCIDENT – AUXILIARY FAN TRIP CAUSES RISE IN METHANE LEVELS

During the final stage of a mine's high-pressure sand stimulation trial, background gas levels measured an increase involving a continuous miner. As planned, the continuous miner mined through several of the drainage holes successfully, including some of the stimulated holes.

The gas levels measured were being managed with the panel ventilation set-up until the auxiliary fan tripped off between shifts. On inspection, the deputy found 2% methane behind the continuous miner and over 4% in the vent line. The heading was then successfully degassed following the mine site procedures.

At no time were operators exposed to greater than 2% methane. However, the fact it was an accessible roadway due to production activities increased the potential.

**Recommendations to industry**

- Ensure procedures are in place to enable degassing places where methane has accumulated
- Ensure that methane monitoring plant is provided to enable for the capture, storage, retrieval and dissemination of information relating to methane concentrations detected

# Sector profiles

**NSW Resources Regulator**

**SECTOR REPORTING**

## Coal mines

Open cut, underground and coal preparation plants

## Large mines

METALLIFEROUS AND QUARRIES

Quarries that produce >900,000 tonnes pa and large open cut 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, open cut or underground metalliferous mines and gemstone mines

## Petroleum and geothermal sites

Onshore petroleum and geothermal productions and exploration sites

## Opal mines

Opal mines at Lightning Ridge and White Cliffs

## Exploration sites

Exploration sites (excluding petroleum)

## Non-mines

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

# Coal sector

## Incident notifications

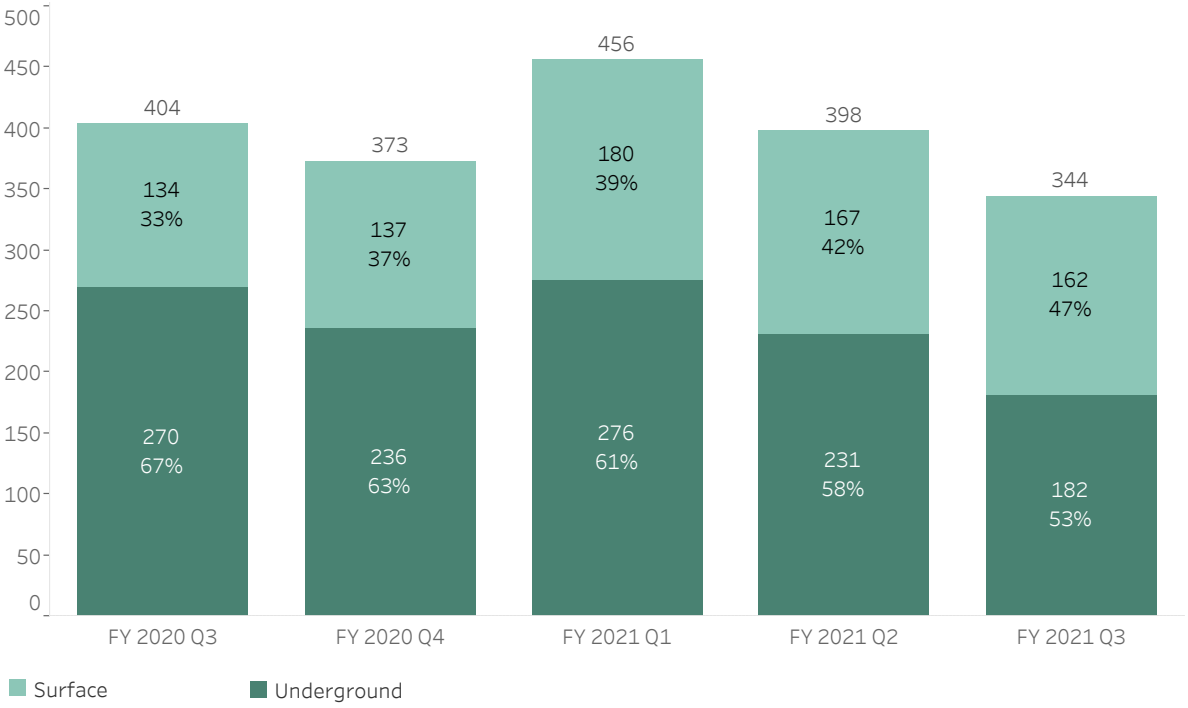
Under work health and safety legislation, mine operators must notify the regulator about the occurrence of certain types of safety incidents. Incident notification data (by active mine) provides insights into sector-specific reporting trends.

**TABLE 2.** COAL SECTOR INCIDENT NOTIFICATION RECEIVED RATES JANUARY 2020 TO MARCH 2021

| MEASURE | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 | FY 2021 Q3 |
|---|---|---|---|---|---|
| Incidents | 404 | 373 | 456 | 398 | 344 |
| Active mines | 127 | 122 | 118 | 117 | 118 |
| Incident rate per active mine | 3.18 | 3.06 | 3.86 | 3.40 | 2.92 |
| Mines that notified incidents | 61 | 49 | 57 | 54 | 51 |
| % of mines notifying an incident | 48% | 40% | 48% | 46% | 43% |
| Incident rate per notifying mine | 6.62 | 7.61 | 8.00 | 7.37 | 6.75 |

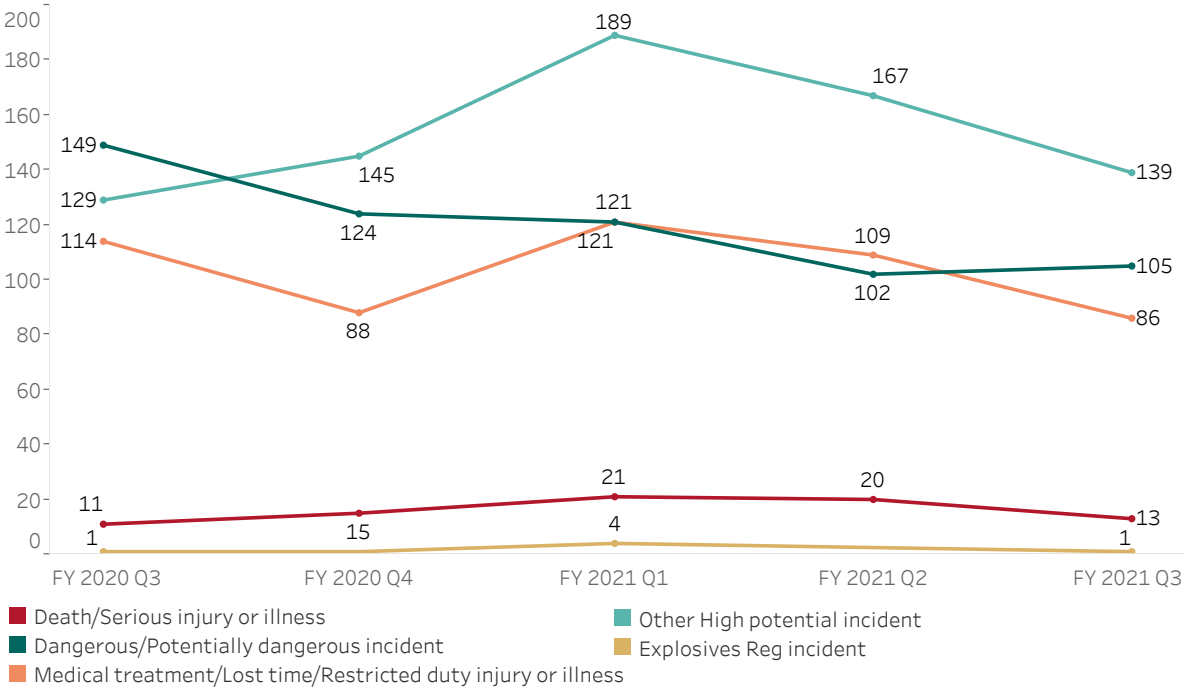
The following graph shows the proportion of safety incident notifications received from surface and underground coal operations. This quarter there was a decrease in the number of incidents notified across both underground and surface coal operations.

**FIGURE 16.** COAL SECTOR INCIDENT NOTIFICATIONS BY OPERATION TYPE JANUARY 2020 TO MARCH 2021




The graph below presents a breakdown of safety incidents notified to the NSW Resources Regulator by the coal sector by the requirement to report. While this quarter saw a small increase in notifications of dangerous and potentially dangerous incidents, ongoing decreases were observed across the other breakdown categories.

**FIGURE 17.** COAL SECTOR INCIDENT NOTIFICATIONS BY REQUIREMENT TO REPORT JANUARY 2020 TO MARCH 2021



## Incident notifications by principal hazard

The figure below shows the number of incident notifications received from the coal sector during the past two quarters, as classified against related principal hazards and principal control plans. The findings highlight hazards where mine operators need to ensure their risk management controls remain fully effective — this includes ensuring the effectiveness of electrical/mechanical engineering control plans in underground operations and controls for managing fire or explosion hazards in surface operations.

**FIGURE 18.** COAL MINE INCIDENTS CLASSIFIED BY PRINCIPAL HAZARD BY OPERATION TYPE OCTOBER 2020 TO MARCH 2021

# Large mines sector

## Incident notifications

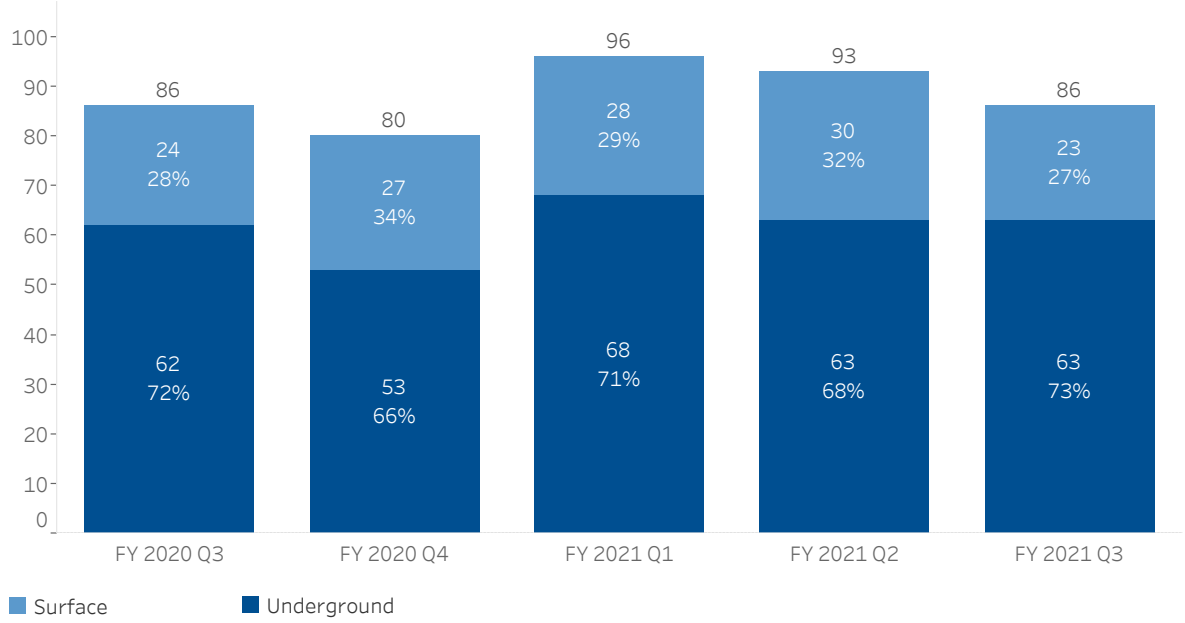
Under work health and safety legislation, mine operators must notify the regulator about the occurrence of certain types of safety incidents. Incident notification data (by active mine) provides insights into sector specific reporting trends.

**TABLE 3.** LARGE MINES AND QUARRIES SECTOR INCIDENT NOTIFICATIONS RECEIVED RATES JANUARY 2020 TO MARCH 2021

| MEASURE | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 | FY 2021 Q3 |
|---|---|---|---|---|---|
| Incidents | 86 | 80 | 96 | 93 | 86 |
| Active mines | 39 | 39 | 40 | 40 | 44 |
| Incident rate per active mine | 2.21 | 2.05 | 2.40 | 2.33 | 1.95 |
| Mines that notified incidents | 25 | 25 | 30 | 23 | 24 |
| % of mines notifying an incident | 64% | 64% | 75% | 58% | 55% |
| Incident rate per notifying mine | 3.44 | 3.20 | 3.20 | 4.04 | 3.58 |

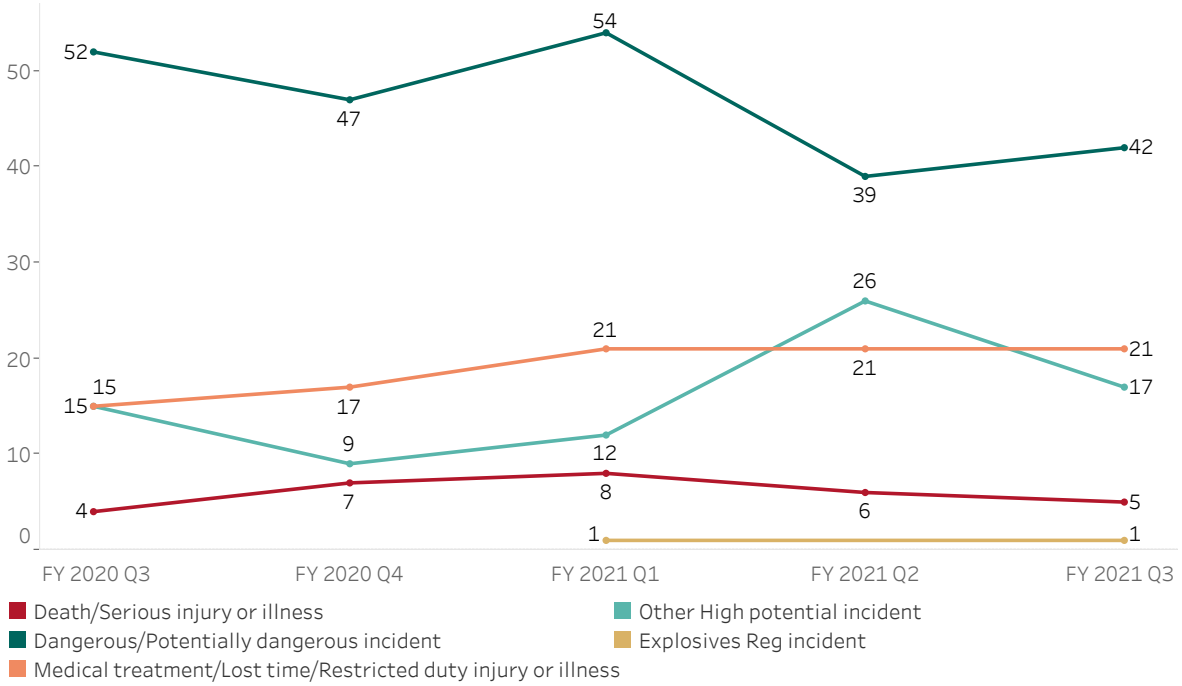
The following graph shows the proportion of safety incident notifications received from large mines and quarries by operation types.

**FIGURE 19.** LARGE MINES AND QUARRIES INCIDENT NOTIFICATIONS BY OPERATION TYPE JANUARY 20209 TO MARCH 2021




The following graph presents a breakdown of safety incidents notified to the NSW Resources Regulator by the large mines and quarries sector based on the requirement to report under the safety legislation. While a decrease in 'dangerous' and 'potentially dangerous' incidents was observed this quarter, numbers of 'other high potential' incidents remained high compared to earlier quarters. Exceedances of the airborne contaminants and dust exposure standards (associated with increased monitoring by mining operators) has contributed to this ongoing increase highlighting the need for mine operators to ensure their risk management controls associated with airborne contaminants remain fully effective. More information about airborne contaminants and dust and the updated exposure standards can be found on our website.

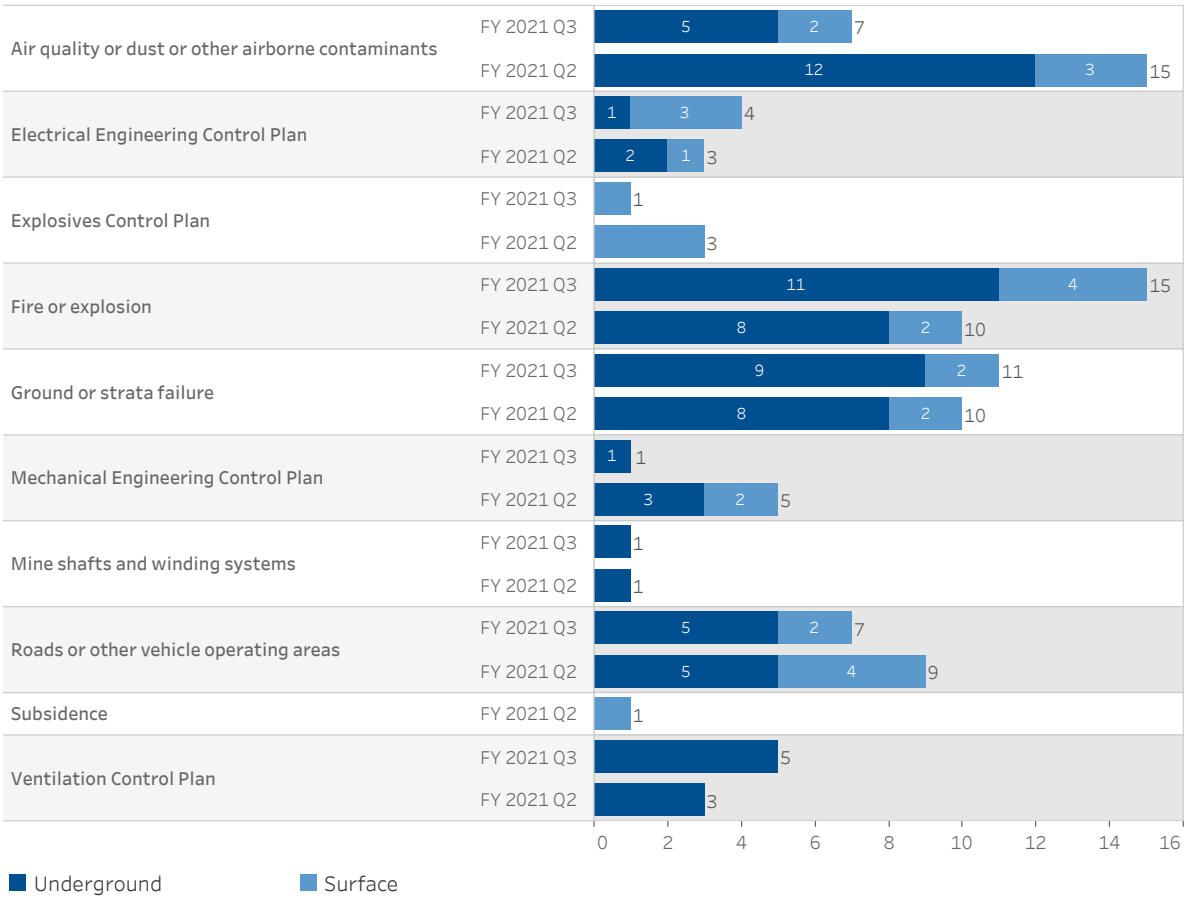
**FIGURE 20.** LARGE MINES AND QUARRIES INCIDENT NOTIFICATIONS BY REQUIREMENT TO REPORT JANUARY 2020 TO MARCH 2021




## Incident notifications by principal hazard

The figure below shows the number of incident notifications received from the large mines and quarries sector during the past two quarters as classified against related principal hazards and principal control plans. The findings highlight hazards where mine operators need to ensure their risk management controls remain fully effective. This includes controls for managing hazards associated with airborne contaminants and dust specifically those for managing atmospheric crystalline silica.

**FIGURE 21.** LARGE MINES AND QUARRIES INCIDENTS CLASSIFIED BY PRINCIPAL HAZARD BY OPERATION TYPE OCTOBER 2020 TO MARCH 2021




# Small mines sector

## Incident notifications

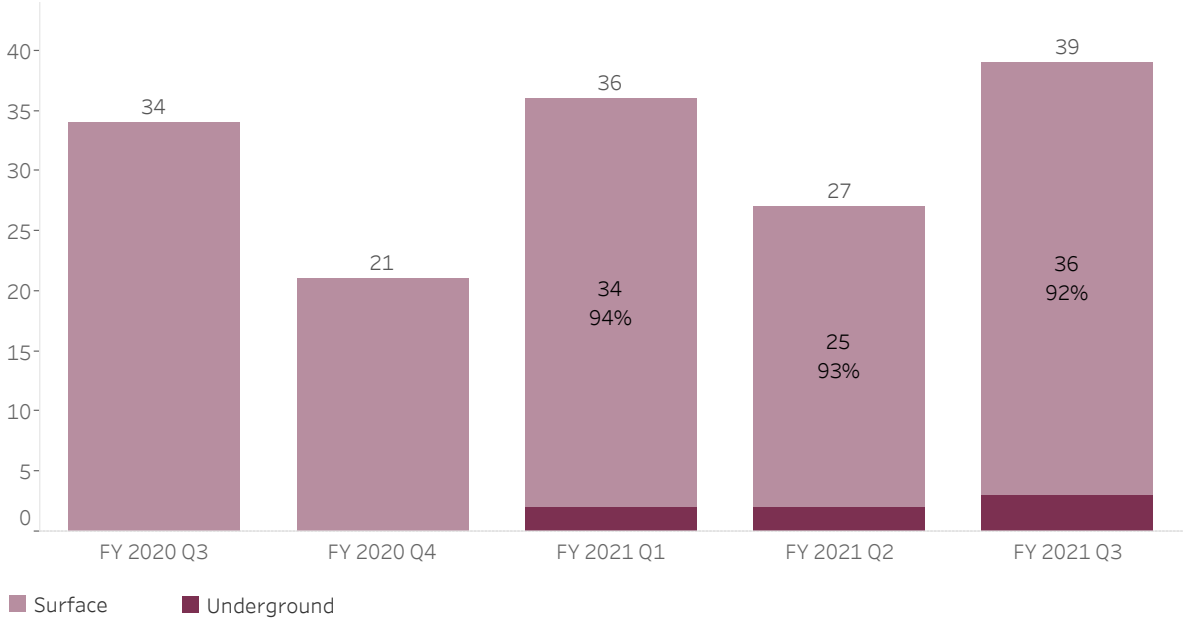
Under work health and safety legislation, mine operators must notify the regulator about the occurrence of certain types of safety incidents. Incident notification data (by active mine) provides insights into sector specific reporting trends.

**TABLE 4.** SMALL MINES AND QUARRIES SECTOR INCIDENT NOTIFICATIONS RECEIVED RATES JANUARY 2020 TO MARCH 2021

| MEASURE | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 | FY 2021 Q3 |
|---|---|---|---|---|---|
| Incidents | 34 | 21 | 36 | 27 | 39 |
| Active mines | 2683 | 2671 | 2658 | 2654 | 2624 |
| Incident rate per active mine | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Mines that notified incidents | 26 | 19 | 32 | 23 | 33 |
| % of mines notifying an incident | 0.97% | 0.71% | 1.20% | 0.87% | 1.26% |
| Incident rate per notifying mine | 1.31 | 1.11 | 1.13 | 1.17 | 1.18 |

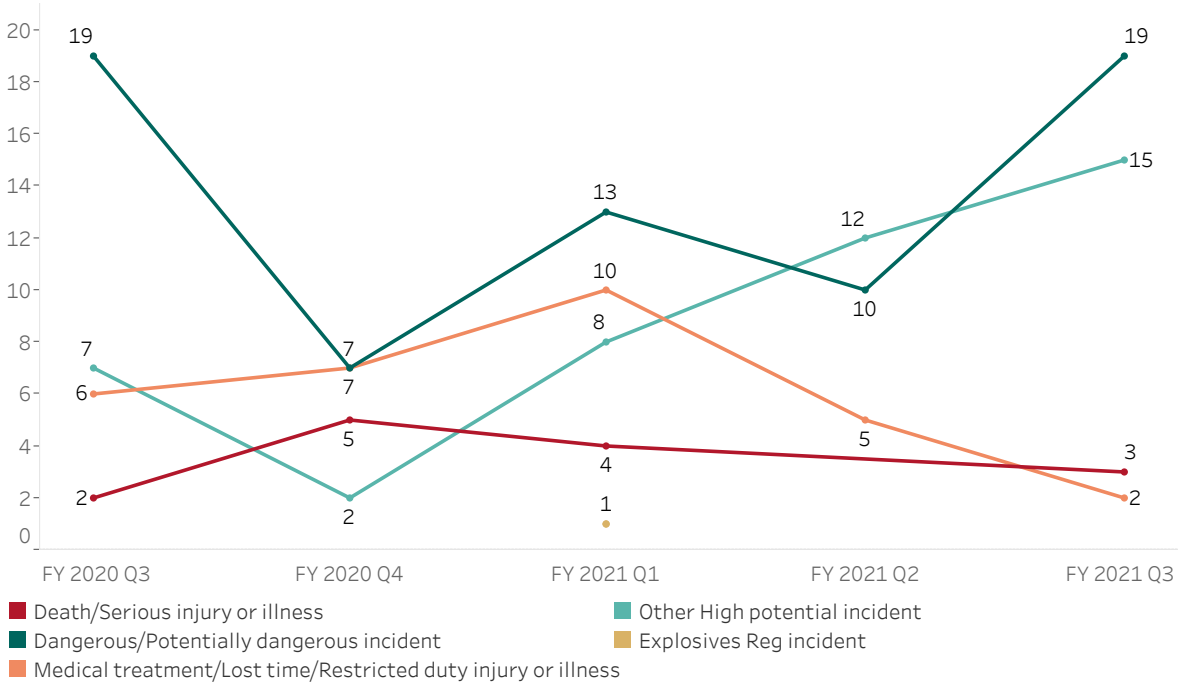
The graph below shows the proportion of safety incident notifications received from small mines and quarries.

**FIGURE 22.** SMALL MINES AND QUARRIES INCIDENT NOTIFICATIONS BY OPERATION TYPE JANUARY 2020 TO MARCH 2021




The graph below presents a breakdown of safety incidents notified to the NSW Resources Regulator by the small mines sector by the requirement to report. This quarter saw an increase in 'dangerous and potentially dangerous' incidents as well as an ongoing increasing trend for 'other high potential' incidents. Comparatively, the number of incidents notified by the sector is substantially lower than what is reported by the coal and large mines sector.

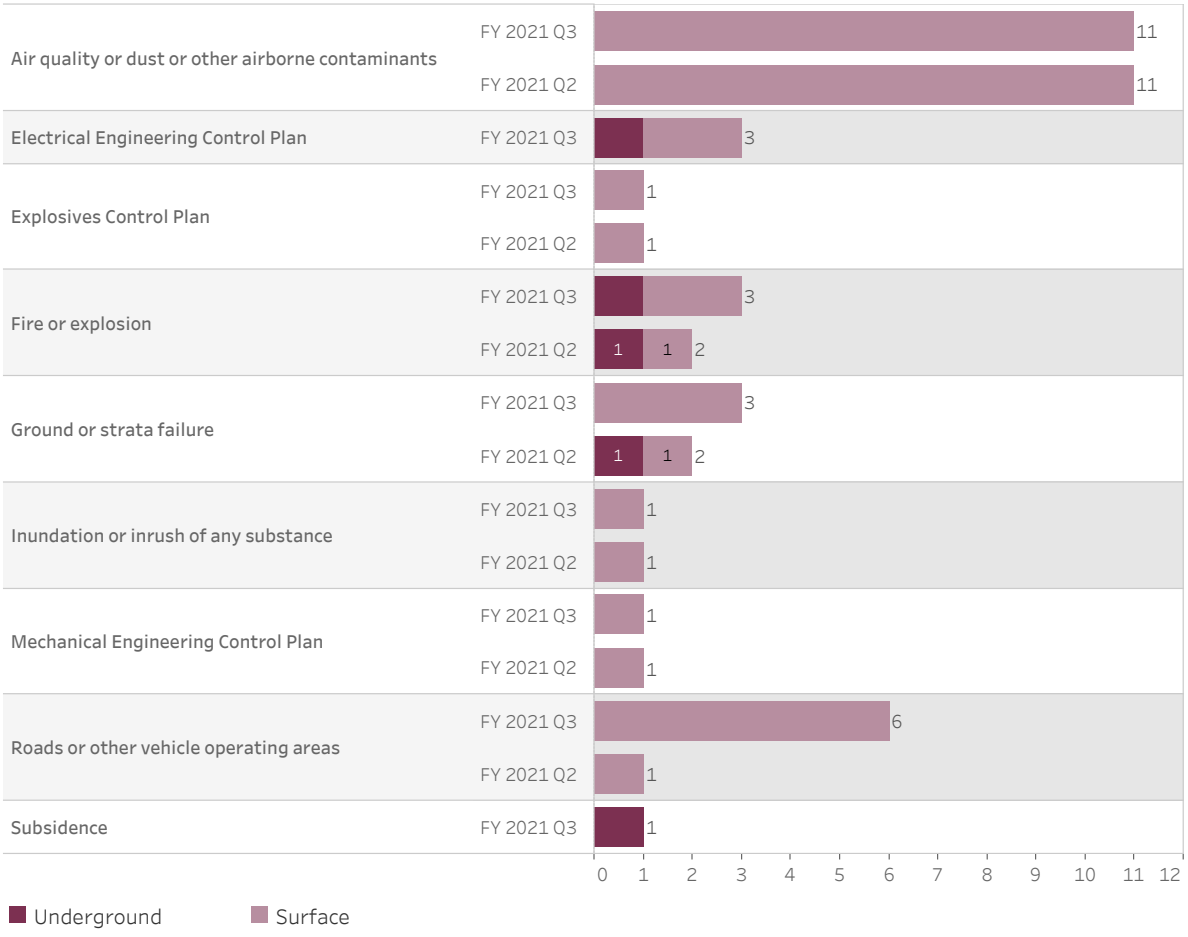
**FIGURE 23.** SMALL MINES AND QUARRIES INCIDENT NOTIFICATIONS RECEIVED BY REQUIREMENT TO REPORT JANUARY 2020 TO MARCH 2021



## Incident notifications by principal hazard

The figure below shows the number of incident notifications received from the small mines sector during the past two quarters as classified against related principal hazards and principal control plans. The findings highlight hazards where small mine operators need to ensure their risk management controls remain fully effective — this includes controls for managing hazards associated with airborne contaminants /dust and roads or other vehicle operating areas.

**FIGURE 24.** SMALL MINES AND QUARRIES INCIDENTS CLASSIFIED BY PRINCIPAL HAZARD BY OPERATION TYPE OCTOBER 2020 TO MARCH 2021



# Other mines sector profiles

## Incident notifications

Under work health and safety legislation, mine operators must notify the regulator about the occurrence of certain types of safety incidents.

This section relates to petroleum and geothermal sites, opal mines and exploration sites. The tables below show the number and types of incident notifications by requirement to report and by principal hazard.

**TABLE 5.** PETROLEUM AND GEOTHERMAL SITES, OPAL MINES AND EXPLORATIONS SITES INCIDENT NOTIFICATIONS JANUARY 2020 TO MARCH 2021

| | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 | FY 2021 Q3 |
|---|---|---|---|---|---|
| Petroleum and geothermal sites* | - | - | - | - | - |
| Opal mines | - | - | - | 1 | - |
| Explorations sites** | 2 | 5 | 3 | 0 | 2 |

* includes exploration
** excludes petroleum and geothermal

**TABLE 6.** EXPLORATION SITES INCIDENT NOTIFICATIONS BY REQUIREMENT TO REPORT JANUARY 2020 TO MARCH 2021

| REQUIREMENT TO REPORT | FY 2020 Q2 | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 |
|---|---|---|---|---|---|
| Death/serious injury or illness | - | 2 | - | - | 1 |
| Dangerous/potentially dangerous incident | - | 1 | 1 | - | - |
| Medical treatment/lost time/restricted duty injury or illness | - | 1 | 2 | - | 1 |
| Other high potential incident | 2 | 1 | - | - | - |
| TOTAL | 2 | 5 | 3 | - | 2 |

**TABLE 7.** EXPLORATION SITE INCIDENT NOTIFICATION BY PRINCIPAL HAZARD JANUARY 2020 TO MARCH 2021

| INCIDENT CLASSIFICATION BY PRINCIPAL HAZARD OR PRINCIPAL CONTROL PLAN | | FY 2020 Q3 | FY 2020 Q4 | FY 2021 Q1 | FY 2021 Q2 | FY 2021 Q3 |
|---|---|---|---|---|---|---|
| Principal hazard | Fire or explosion | 1 | 1 | - | - | - |
| | Roads or other vehicle operating areas | - | - | 1 | - | - |
| | TOTAL | 1 | 1 | 1 | - | - |
| Principal control plan | Mechanical engineering control plan | - | 1 | - | - | - |
| Not applicable | Not applicable | 1 | 3 | 2 | - | 2 |
| **TOTAL** | | **2** | **5** | **3** | **-** | **2** |

# Compliance and enforcement

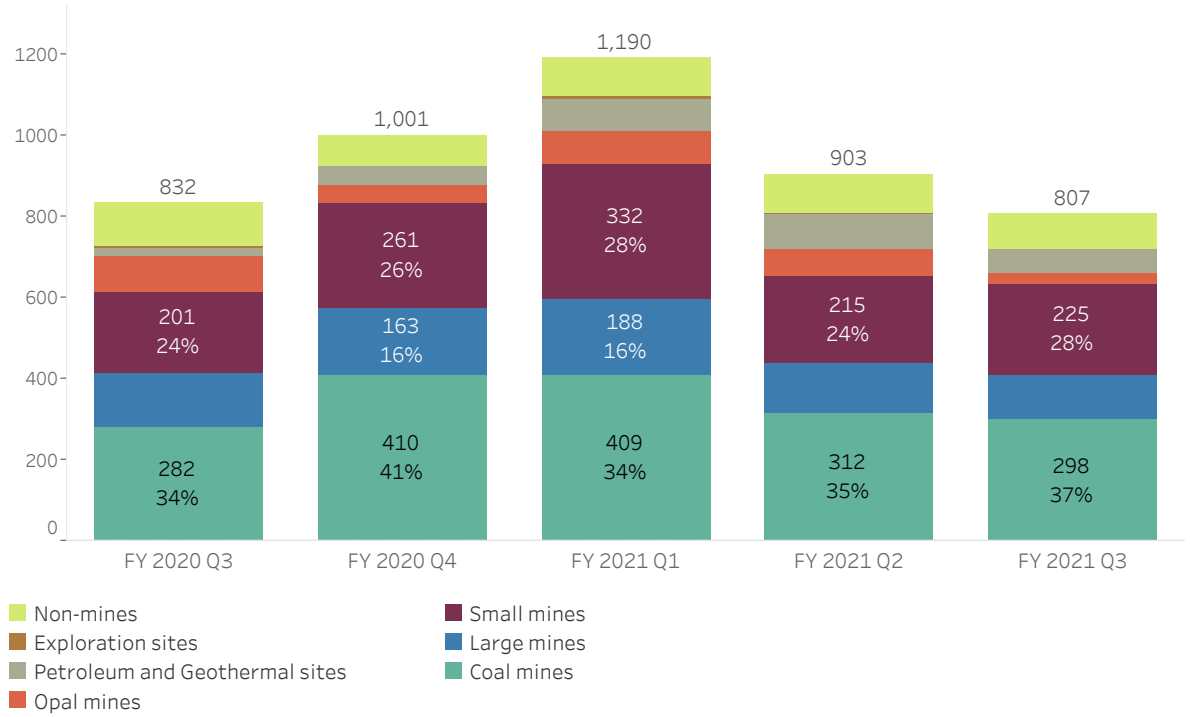
The Regulator uses a range of tools to promote and secure compliance in mines and petroleum sites in relation to work health and safety legislation. These include desktop assessments, site inspections, investigations and enforcement actions, such as issuing notices and commencing prosecutions.

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

This quarter saw an overall decrease in the number of assessments for a second quarter running. The previously observed quarter-on-quarter increases in the small mines sector had been driven by multiple assessments being undertaken during a single inspection.

**FIGURE 25.** SAFETY ASSESSMENTS BY SECTOR JANUARY 2020 TO MARCH 2021



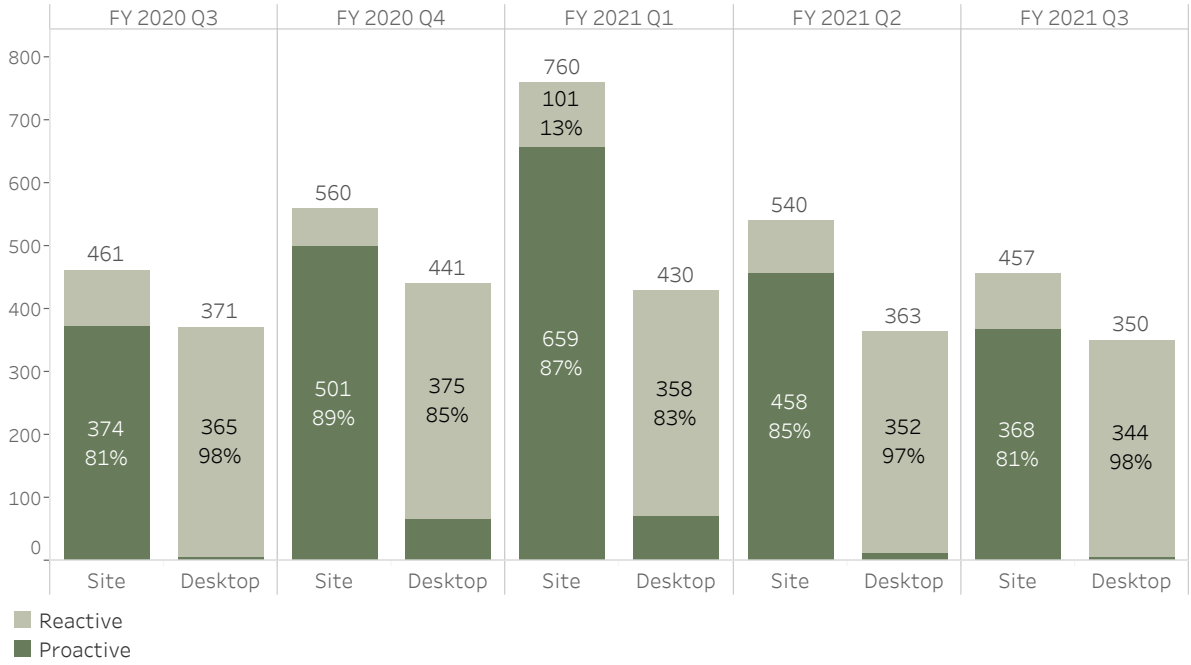
# Safety assessments by category and nature

Site-based (visiting mine sites) and desktop activities are both important regulatory tools. While the main focus of our on-site compliance activity is on preventing incidents through planned risk-based proactive assessments, our desktop activities are mainly reactive.

Site-based proactive assessments focus on establishing whether critical controls have been effectively implemented. Meanwhile desktop assessment activities include reviews of control measures following an incident, review of personal dust monitoring reports submitted by coal mine operators, assessment of high-risk activity notifications, applications for exemptions from work health and safety laws, subsidence management plans and preparation for site work.

Our proactive assessments on airborne quality or dust contaminants contributed to the spike observed in proactive site assessments during FY 2021 Q1.

**FIGURE 26.** SAFETY ASSESSMENTS BY CATEGORY AND NATURE JANUARY 2020 TO MARCH 2021

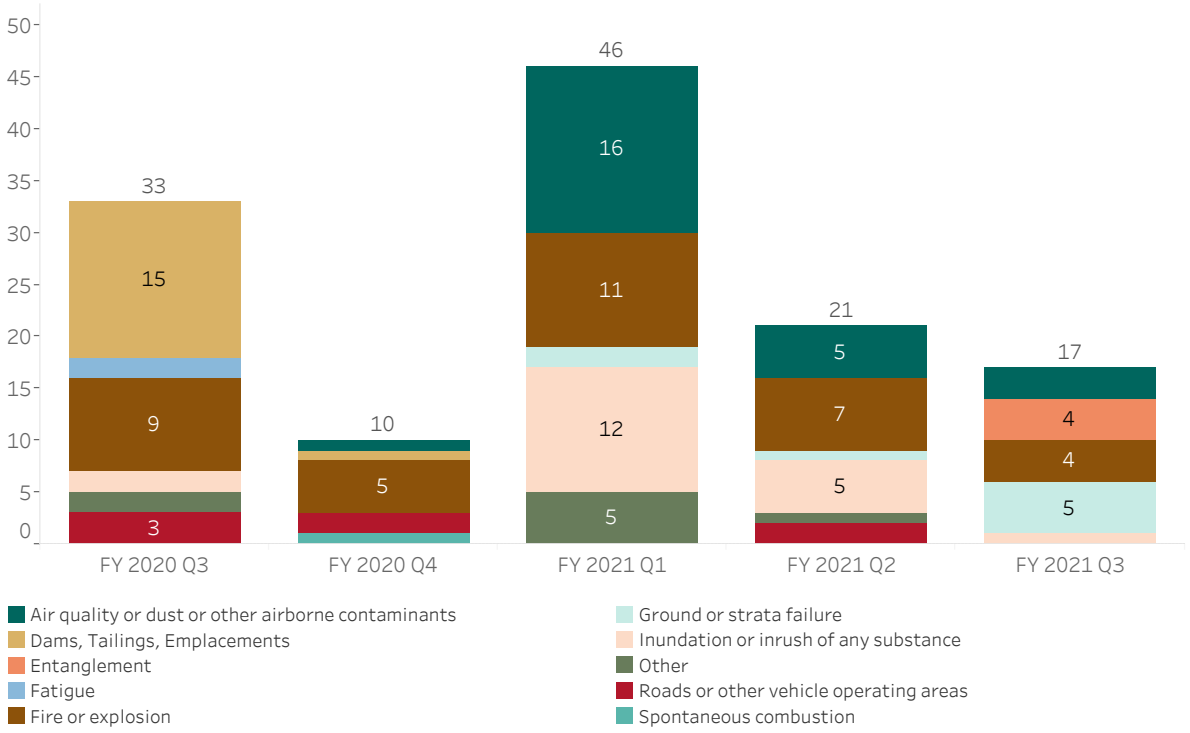



# Targeted assessment program

Our targeted assessment program establishes a risk-based and proactive approach for assessing the extent to which critical controls for managing principal mining hazards have been identified, implemented and are being monitored.

In the current quarter, 17 targeted assessments were commenced across five different hazards.

**FIGURE 27.** TARGETED ASSESSMENTS BY HAZARD JANUARY 2020 TO MARCH 2021

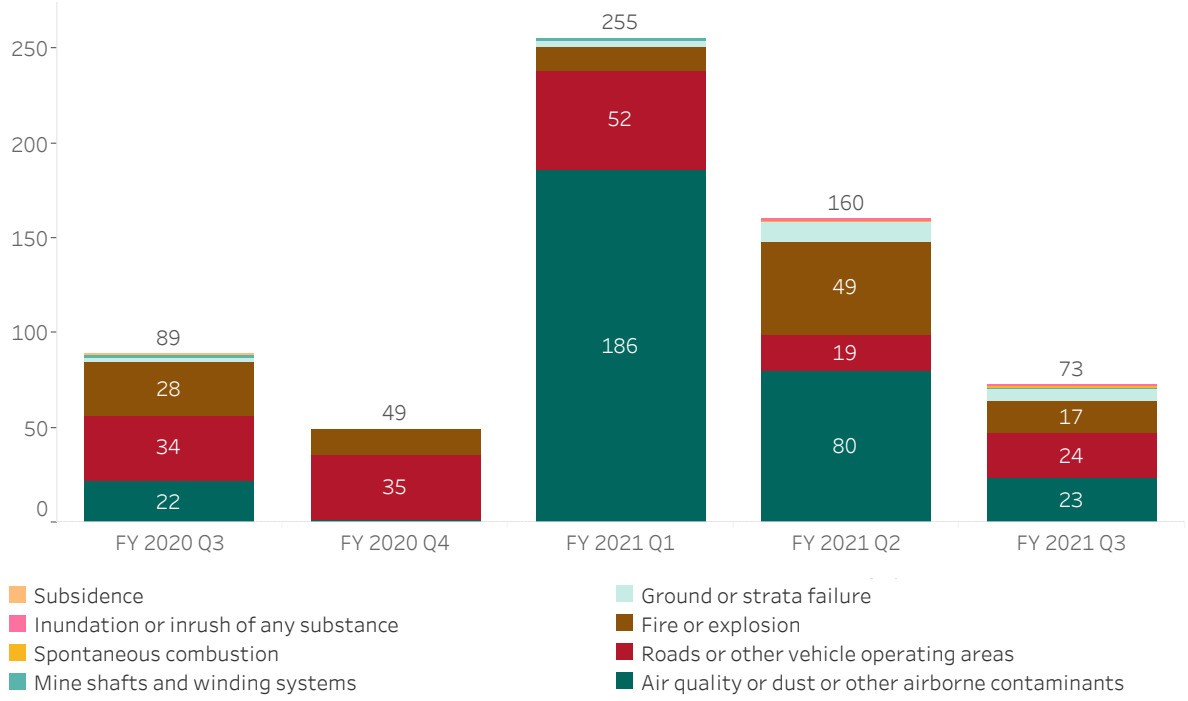


# Planned inspections

Planned inspections assist in identifying compliance weaknesses which could lead to an incident or injury. These assessments focus on the physical implementation of critical controls in the operating areas of a mine.

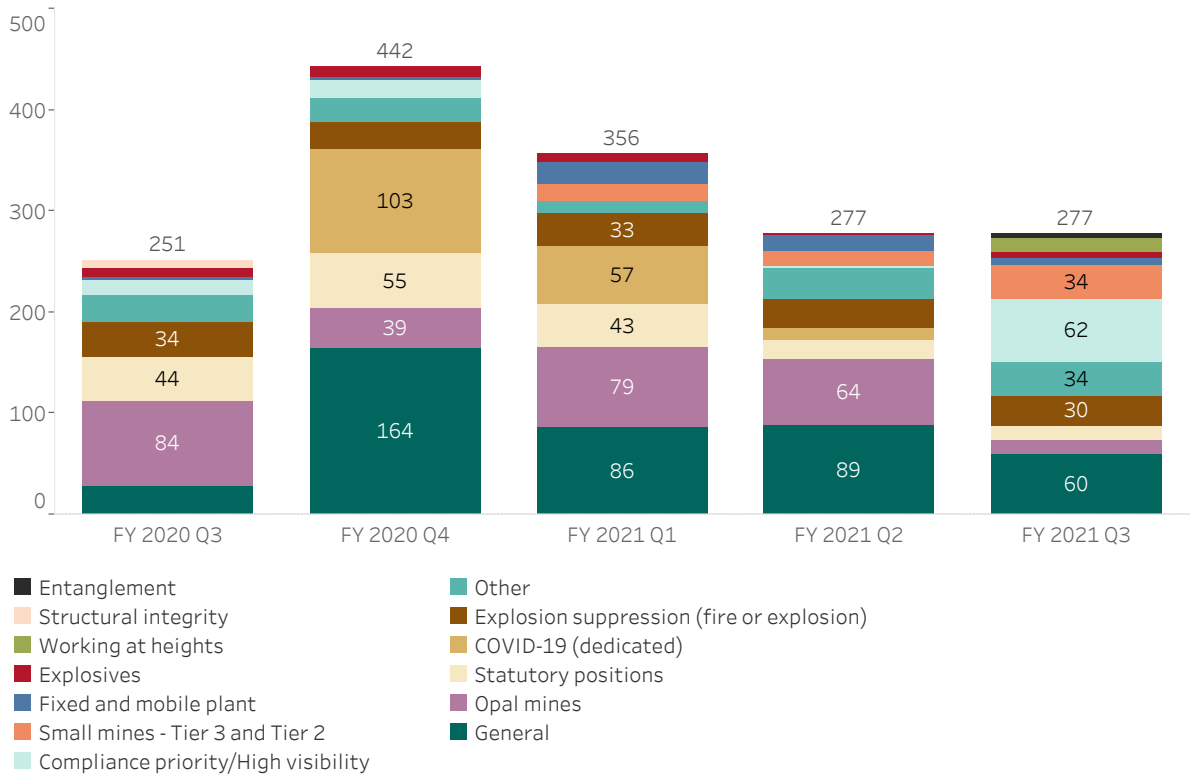
Planned site inspections were commenced on the principal hazards shown in the graph below.

**FIGURE 28.** PLANNED INSPECTIONS BY PRINCIPAL HAZARD JANUARY 2020 2019 TO MARCH 2021




The graph below shows planned site inspections commenced for 'other' hazards. This quarter saw an increased focus on Tier 2 and 3 small mines and quarries.

**FIGURE 29.** PLANNED INSPECTIONS BY 'OTHER' HAZARD JANUARY 2020 TO MARCH 2021

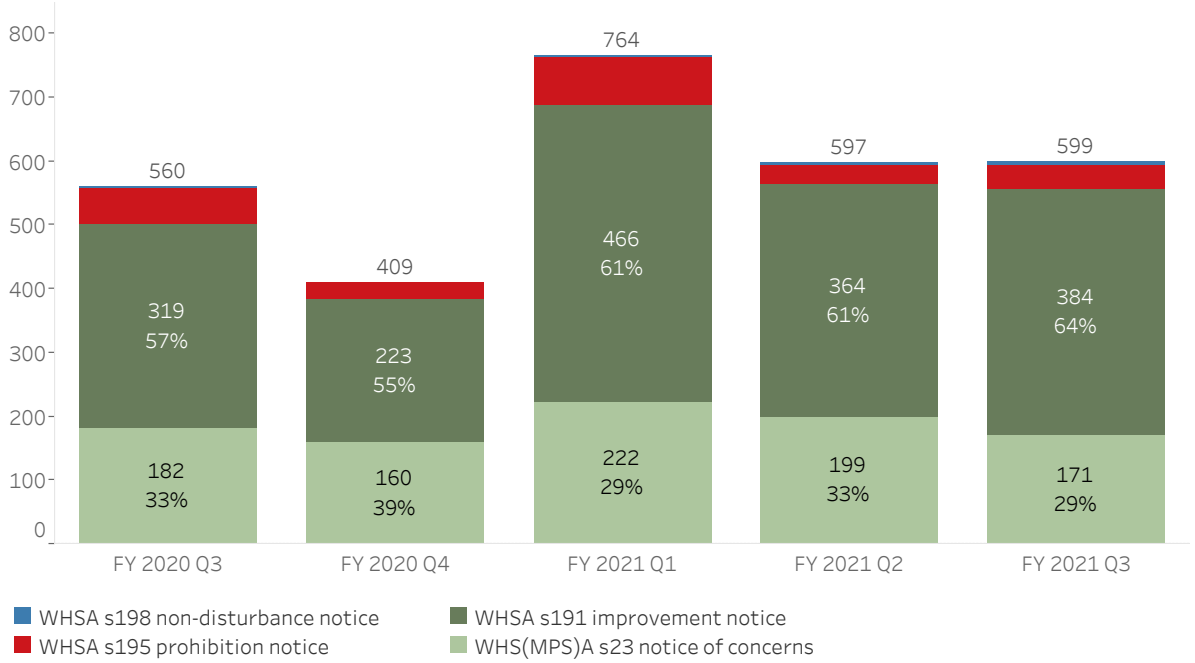



# Safety notices issued

We issue risk-based safety notices including prohibition and improvement notices, notices of concern (written notice of matters) and non-disturbance notices.

The following graph shows the number and types of safety notices issued during each of the five quarters since January 2020. This quarter saw no change in the number of notices issued.

**FIGURE 30.** SAFETY NOTICES ISSUED BY NOTICE TYPE JANUARY 2020 TO MARCH 2021




The figure below shows no change in safety notices issued by mining sector during the past two quarters.

**FIGURE 31.** SAFETY NOTICES ISSUED BY SECTOR JANUARY 2020 TO MARCH 2021