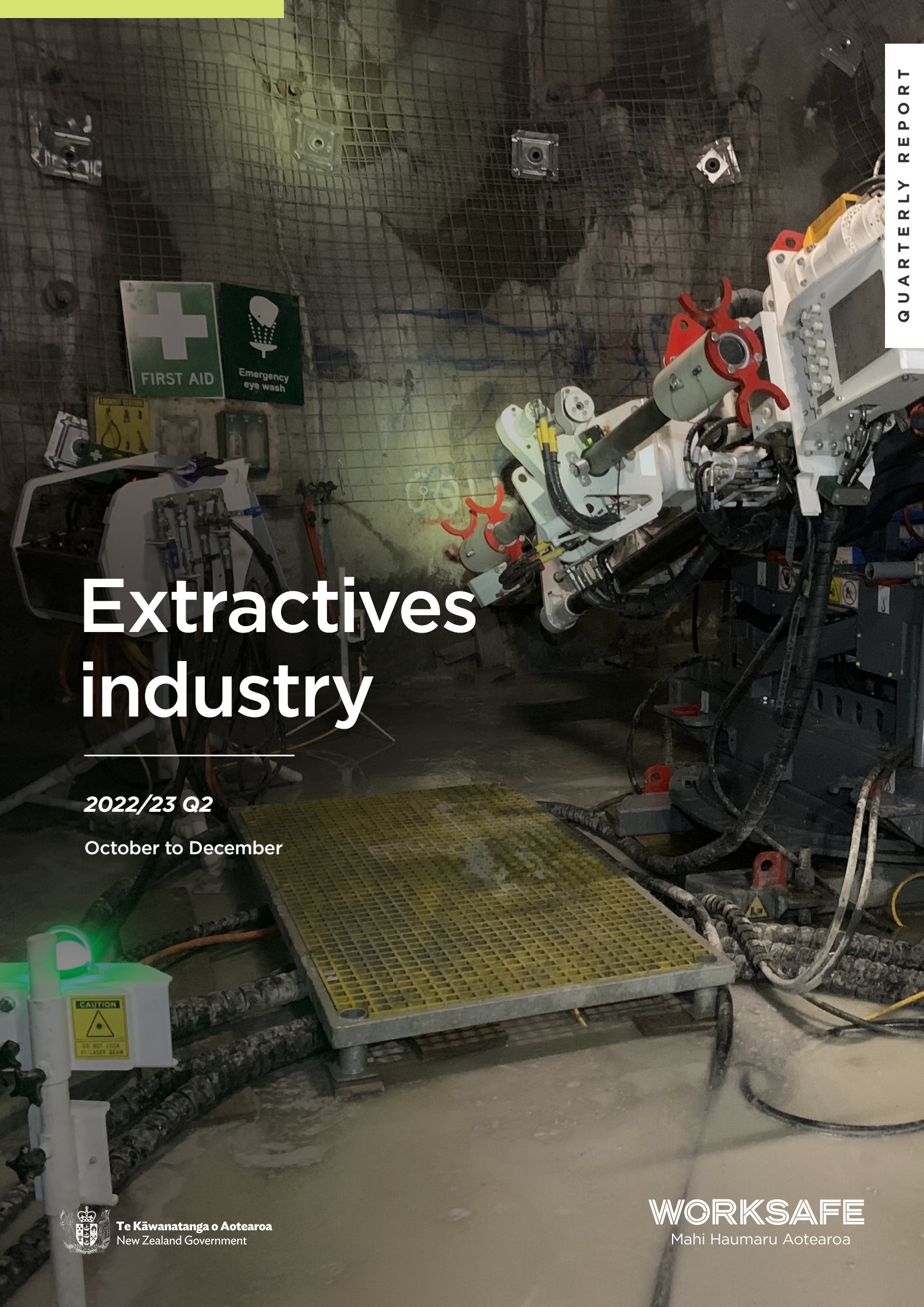
QUARTERLY REPORT



Extractives industry

2022/23 Q2

October to December

Te Kāwanatanga o Aotearoa
New Zealand Government

WORKSAFE
Mahi Haumaru Aotearoa

About this report

This quarterly health and safety performance report has been prepared by WorkSafe New Zealand to provide extractives-specific information to mining, tunnelling and quarrying operations in New Zealand.

The information is derived from a variety of sources but the predominant source is industry itself, through notifiable incident reporting and quarterly reporting.

The report also contains information on the activities of the regulator, as well as commentary on industry performance and focus areas for regulation.

Operators should use the information presented in this report to assist them in improving safety management systems and undertaking risk assessments at their sites.

Foreword

Our mission is to transform New Zealand's health and safety performance towards world-class. To achieve this requires the commitment not just of WorkSafe New Zealand, but of businesses, workers and a wide range of other players in the health and safety system.

It seems that currently there are many factors influencing work environments and the running of any business. There are inflating costs, general pessimism in much of the construction sector, and there is a well-publicized shortage of workers.

These conditions tend to go through cycles, and currently there is still strong demand for the products of mines and quarries, so all the news is not bad.

You might ask why the health and safety regulator is even mentioning these types of factors, and what relevance it has to safety in our industry.

In simple terms, health and safety is often forgotten when other pressures, especially financial, are perceived to have become more important.

Managers and owners can become preoccupied with business pressure, and operators and other staff can be distracted by similar pressures related to home costs and mortgages etc, while they are going about their daily work.

This is a reminder that operators must remain vigilant to any safety issue that arises, including the behaviour of their workers. In these times it generally pays to spend more time and money on safety. In most instances, ignoring a safety issue is not cost efficient, with incidents often resulting in significant reductions to the bottom line, and more importantly exposes workers to unacceptable risk. Serious incidents can potentially close businesses.

The shortage of workers is one factor that has been around for a while and seems to be getting worse. It is a very difficult problem for many, and in the immediate future will likely result in operators having to spend more time and money on ensuring that they maintain a competent workforce than they may have done previously. There will be additional training required to upskill inexperienced staff.

This investment in training often has quick payback by simply reducing plant damage and improving or maintaining good productivity. Often new trainees are easier to train to your own standards than more experienced persons from other sites. It is often hard to train an old dog to new tricks!

And the advantages of more trained workers in our industry will benefit all of industry for some time.

It is important to remember that if you are short-staffed that you need to modify the workload to reflect this. Managers, supervisors and workers are more likely to make mistakes when they have high workloads.

Paul Hunt
Chief Inspector Extractives

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1.0 Industry profile

IN THIS SECTION:

1.1 Operations

4

Metalliferous opencast mines
Includes one suspended mine and one mine under rehabilitation

22

Coal opencast mines
Includes four mines under care and maintenance, and one undertaking rehabilitation

6

Metalliferous underground mines
Includes two mines under care and maintenance and two operating tourist mines

1

Coal underground mines
Includes one tourist mine under care and maintenance

9

Tunnels
Does not include tunnels that notified commencement but did not begin operating in the quarter

1

Coal exploration
One operational coal exploration project

62

Alluvial mines
Number of mines that have been verified (54) or have notified of an Appointed Manager to WorkSafe (8) (includes 2 iron sands mines)

942

Quarries
Number of quarries that have been verified (824) or have notified of an Appointed Manager to WorkSafe but not yet verified (118)

An important aspect of understanding the health and safety performance of the extractives industry is to understand its makeup in terms of the number and scale of operations and the number and competency of workers involved.

There were 1,047 active operations in New Zealand as at the end of December 2022.

Active mining operations include those that are operating, intermittently operating, under care and maintenance, or undertaking rehabilitation, as well as tourist mines. Active quarries and alluvial mine numbers include operations that have been verified as actively or intermittently operating (that is, visited by WorkSafe), or have notified WorkSafe of an Appointed Manager.

1.2 People

742

Metalliferous opencast mines
545 FTEs employed by mine operators and 197 FTEs employed by contractors

752

Coal opencast mines
623 FTEs employed by mine operators and 129 FTEs employed by contractors

416

Metalliferous underground mines
348 FTEs employed by mine operators and 68 FTEs employed by contractors

0

Coal underground mines
0 FTEs employed by mine operators and 0 FTEs employed by contractors

535

Tunnels
338 FTEs employed by mine operators and 198 FTEs employed by contractors

<1

Coal exploration
2 workers employed by mine operators worked 150hrs and 1 worker employed by contractors worked 20 hours

453

Alluvial mines
Number of workers is known for 35 of the 62 alluvial mines that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 27 operations

3,063

Quarries
Number of workers is known for 750 of the 942 quarries that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 192 operations

There were 5,961 Extractives FTEs in New Zealand as at the end of December 2022. The numbers of workers will also vary from quarter to quarter. Changes in the number of quarry and alluvial mine workers largely reflect the changes in the number of active operations verified by inspectors. Part of those verifications includes determining the number of workers at each operation.

Note: Typically >95% of mining operations and tunnelling operations submit quarterly reports to WorkSafe, and the numbers of workers are reported directly from these figures.

This was the first quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe. Quarterly reports were provided by 11 alluvial mining operations (18%) and 274 quarries (29%). That is the reason for the significant difference between the extrapolated numbers of workers and the actual number of workers reported for these sectors in Figure 2. WorkSafe will continue to extrapolate numbers of workers for quarries and alluvial mines until the reporting percentage has improved.

Figure 1 shows the total hours worked in Q2 2022/23, reported to WorkSafe in the quarterly reporting. The hours are separated into Employees and Contractors.

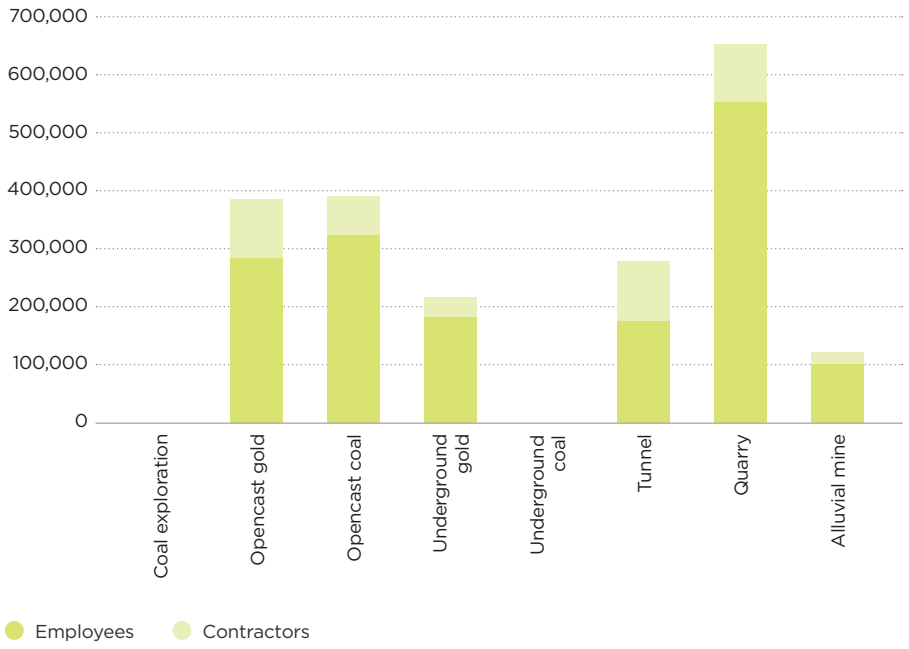

FIGURE 1:
Total hours worked by sector 2022/23 Q2

Figure 2 shows the number of Full Time Equivalents (FTEs) calculated from total hours worked that were reported to WorkSafe in quarterly reports for Q2 2022/23. The hours are separated into Employees and Contractors.

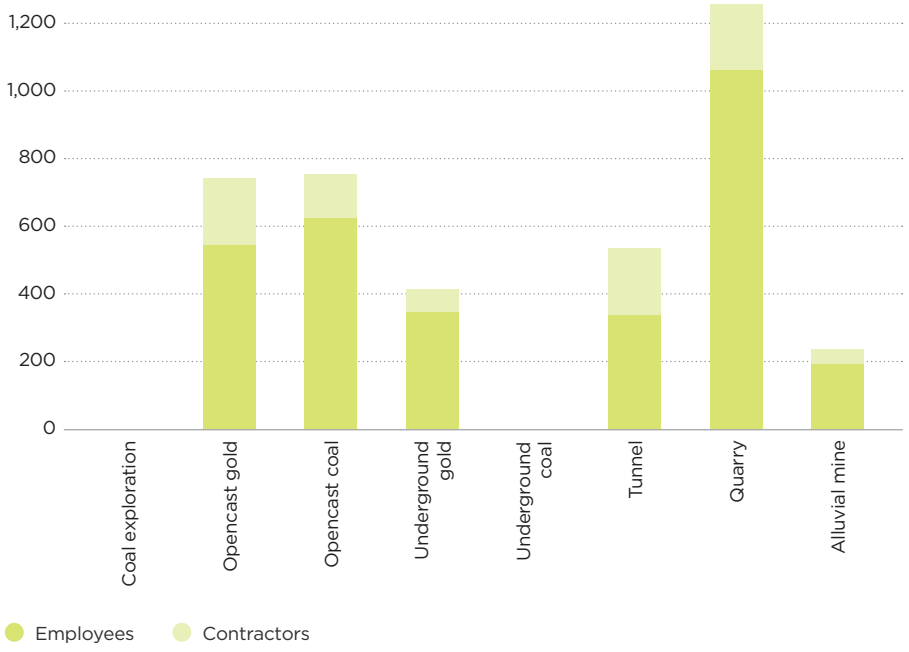

FIGURE 2:
Number of FTEs by sector 2022/23 Q2

1.3 Developing competence

WorkSafe has responsibility for setting the competency standards in the Extractives Industry. Improving the competence of the people in the industry is one of the most important aspects of improving health and safety performance. WorkSafe appoints the New Zealand Mining Board of Examiners (BoE) to recommend competency requirements, conduct oral examinations and to issue, renew, cancel or suspend Certificates of Competence (CoCs).

As was advised in the last Quarterly report, consultation on the Safe Work Instrument (SWI) which will prescribe the Industry competency requirements will commence in April 2023. The target is to have the final SWI in place by 18 July 2023.

What is a Safe Work Instrument?

A safe work instrument is a form of legislation that supports or complements regulations. A safe work instrument can also be called a SWI.

Safe work instruments allow for greater flexibility and more timely updates to the regulatory framework, reflecting changes in technology, standards, and health and safety practices.

The Health and Safety at Work Act 2015 (HSWA), Section 227(2) describes their purposes:

> The purposes of safe work instruments are to define terms, prescribe matters, or make other provision in relation to any activity or thing, including (without limitation) listing standards, control of substances, and competency requirements.

Safe work instruments have legal effect only where they are referred to in regulations.

Before a new (or amended) safe work instrument can take effect, it has to be approved by the Minister for Workplace Relations and Safety.

WorkSafe develop safe work instruments to:

- prescribe detailed or technical matters or standards that change relatively frequently and will often be industry-specific
- set additional or modified workplace controls for hazardous substances approved or reassessed by the Environmental Protection Authority
- provide an alternative means of complying with regulations
- support the effective operation of the health and safety regulatory framework, for instance by setting exposure monitoring standards or stipulating requirements for training, competence or safety management systems.

Table 1 provides a summary of oral exams conducted during the quarter.

TOTAL NUMBER OF ORAL EXAMS HELD Q2 OCT–DEC 22	TOTAL PASSES	% SUCCESS
24	19	79.17

TABLE 1:
Oral exams conducted

Table 2 provides a summary of all CoCs issued during the quarter and the current number of CoCs in circulation at the end of Q2 2022/23.
Note: We no longer report Life Time CoCs.

COC TYPE	TOTAL COCs RENEWED Q2 Oct–Dec 2022	TOTAL NEW COCs ISSUED Q2 Oct–Dec 2022	TOTAL NUMBER OF CURRENT COCs
A Grade Quarry Manager	7	4	244
B Grade Quarry Manager	12	11	338
A Grade Opencast Coal Mine Manager	2	0	53
B Grade Opencast Coal Mine Manager	5	0	48
A Grade Tunnel Manager	1	0	36
B Grade Tunnel Manager	2	0	71
Site Senior Executive	4	1	50
First Class Coal Mine Manager	0	0	16
First Class Mine Manager	0	0	16
Coal Mine Deputy	2	0	28
Coal Mine Underviewer	0	0	18
Mechanical Superintendent	1	0	24
Electrical Superintendent	0	2	17
Ventilation Officer	0	0	4
Mine Surveyor	1	0	13
Site Specific	0	1	3
Winding Engine Driver	0	0	0
Total	**37**	**19**	**979**

TABLE 2: Certificates of Competence in circulation

2.0 Health and safety performance

IN THIS SECTION:

2.1 Notifiable events

For all extractive operations, notifiable events are required to be reported to WorkSafe under S23(1), S24(1) and S25(1) of the Act, and under Schedule 5 of the Regulations. Notifiable events include any notifiable incidents, notifiable injuries or illnesses, or fatalities.

The tables below show the number of notifiable events and the number of operations that notified events for the previous three years and for Q1 of Q2 2022/23 for mines and tunnels (Table 3) and quarries and alluvial mines (Table 4).

MINES AND TUNNELS	2019/20 QUARTERLY AVERAGE	2020/21 QUARTERLY AVERAGE	2021/22 QUARTERLY AVERAGE	2022/23 Q1	2022/23 Q2
Number of notifiable events	20	18	20	24	21
Number of operations that notified events	11	9	11	7	9

TABLE 3: Mines and tunnels – notifiable events and operations that notified events

Sixteen individual mines and tunnels from a total of 43 reported notifiable events in the past 12 months.

QUARRIES AND ALLUVIAL MINES	2019/20 QUARTERLY AVERAGE	2020/21 QUARTERLY AVERAGE	2021/22 QUARTERLY AVERAGE	2022/23 Q1	2022/23 Q2
Number of notifiable events	18	16	14	19	14
Number of operations that notified events	15	12	13	18	13

TABLE 4: Quarries and alluvial mines – notifiable events and operations that notified events

Forty-six individual quarries and alluvial mines from a total of 1,004 reported notifiable events in the past 12 months.

Figure 3 shows the number of notifiable events reported to WorkSafe by sector from January 2021 to December 2022.

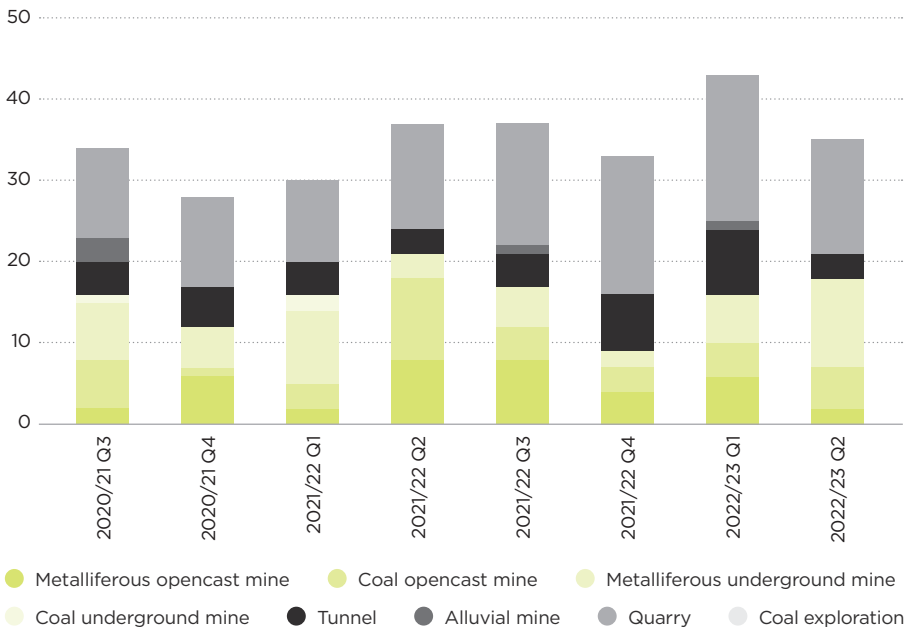

FIGURE 3: Notifiable events by sector

2.2 Injuries

Additional information about injuries is reported to WorkSafe in the form of Quarterly Reports and Records of Notifiable Events under Schedules 6 and 8 of the Regulations. This was the first quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe.

Figure 4 shows the number of injuries by injury type reported to WorkSafe from January 2020 to December 2022. The graph also shows the rolling 12-month average for the Total Recordable Injury Frequency Rate (TRIFR), the rate of recordable injuries that occurred per million hours worked. The current rolling 12-month average TRIFR is 4.4. Rates have fluctuated over past two years without any clear trend.

While TRIFR is not the only measure indicating the health of the industry, it is a useful indicator of how workers are being injured and should be interpreted in conjunction with other data such as notifiable event information.

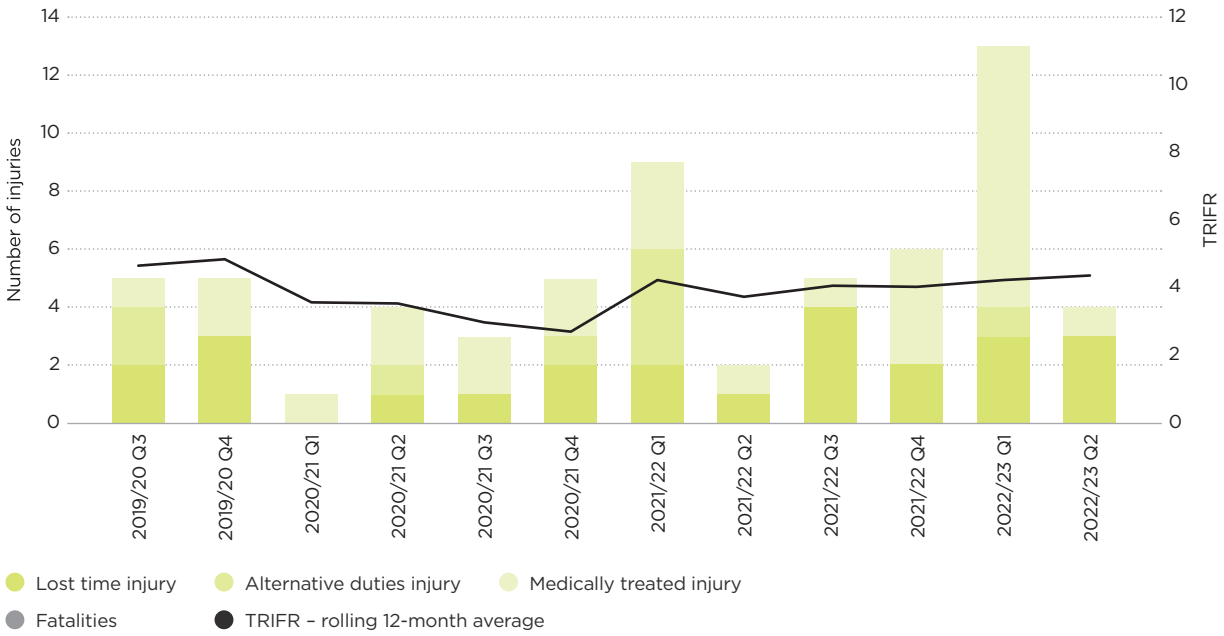

FIGURE 4: TRIFR – mines and tunnels

The following injury definitions are taken from Schedule 8 of the Regulations:

- **Lost-time injuries** are events that involved injury or illness of a mine worker that resulted in the inability of the worker to work for 1 day or more (not including the day of the event) during the reporting period (whether the worker is rostered on that day or not).
- **Alternative duties injuries** are events that involved injury or illness of a mine worker that resulted in the worker being on alternative duties during the reporting period.
- **Medical treatment injuries** are work-related injuries to mine workers that required medical treatment during the reporting period but did not require a day lost from work or alternative duties (other than the day of the event).

Figures 5 and 6 show the number of injuries resulting in more than a week away from work (WAFW), and the sum of the claims costs for those WAFW injuries for the mining and quarrying sectors from April 2020 to September 2022. It is important to note that the number of WAFW injuries for previous quarters may increase over time as ACC can grant claims up to 12 months after an injury has occurred. The claims costs for WAFW injuries for previous quarters will also continue to increase over time as the true costs of those injuries are realised. It may take two years or more for the true costs to be realised. The average cost of Extractives sector WAFW injuries between April 2020 to September 2022 was over $20,350 per injury.

FIGURE 5:
Number of injuries resulting in more than a week away from work

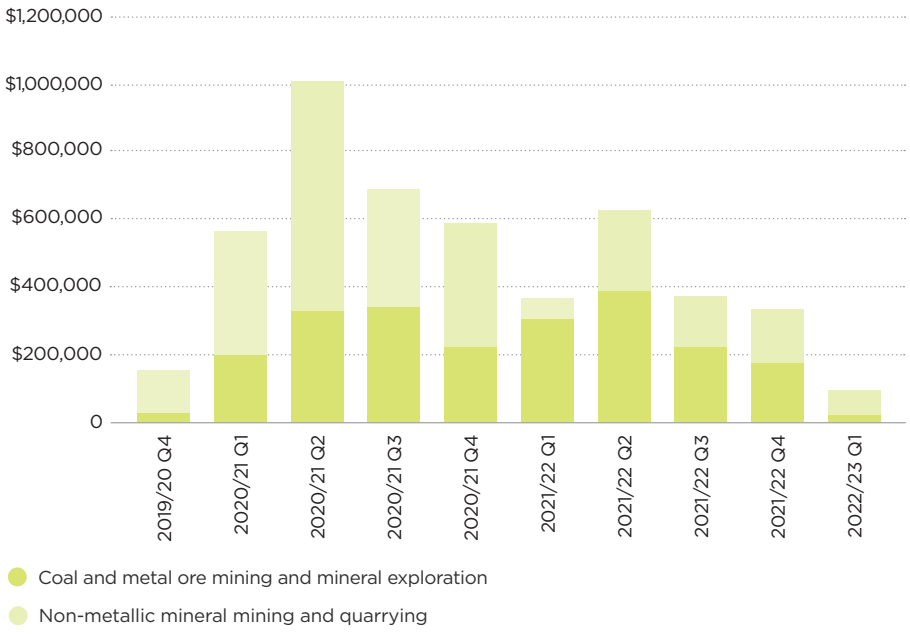

FIGURE 6:
Sum of claims cost (excluding GST) for injuries resulting in more than a week away from work

The data for these graphs comes from our System for Work-related Injury Forecasting and Targeting (SWIFT) database. It includes ACC data on approved work-related injury claims that resulted in more than a week away from work (WAFW). There is an four month lag applied to the data to allow time for the claim information to stabilise, so data for the past quarter is not yet available. While SWIFT data draws on ACC data, differences in counting criteria mean it may not match ACC counts, and should not be considered official ACC data.

2.3 Types of events

Figure 7 shows the notifiable event categories for events notified to WorkSafe in the previous 12 months. The data shows that 43 percent of notifiable events in the past 12 months have occurred in relation to vehicles and plant (30%), and fire, ignition, explosion or smoke (13%). These two categories are broken down in more detail in the following section.

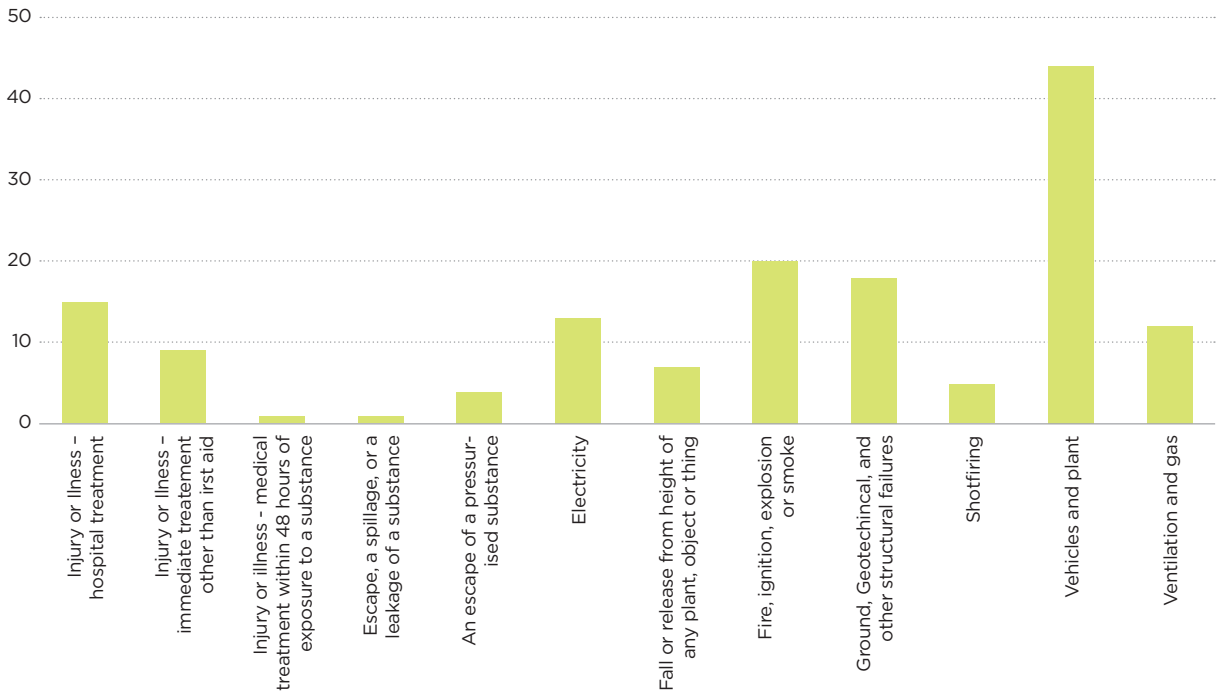

FIGURE 7: Notifiable event categories for the previous 12 months

2.4 Extractives sector focus areas

Where there is a high frequency of notifiable events in any Schedule 5 category, we have broken these events down in more detail to identify key focus areas. We will target our inspections to ensure that operators have adequate controls in place to address these risks.

Figures 8 and 9 break down the two largest notifiable event categories in the past 12 months into the corresponding Schedule 5 sub-categories. The data shows that for notifiable events related to fire, ignition, explosion or smoke, 64% involve fires on plant, mobile plant or in buildings associated with mining or tunnelling activities, and 36% involves the outbreak of a fire on the surface or underground. The vehicle and plant-related notifiable events involve collision of mobile plant with other plant (25%), overturning of mobile plant (57%), unintended movement or brake failure (16%) and burst tyre (2%).

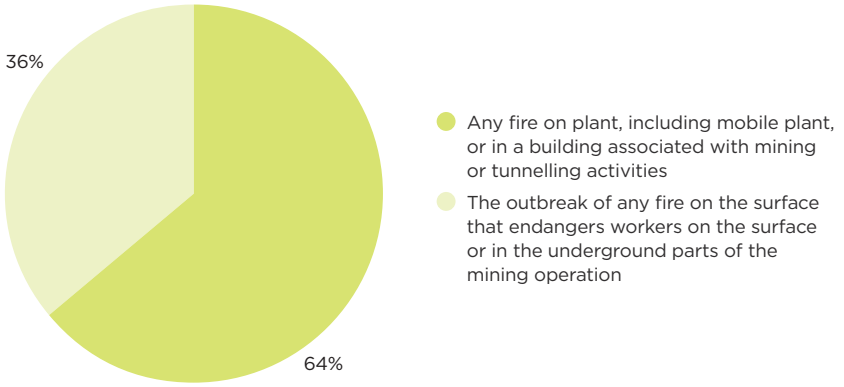

FIGURE 8: Fire, ignition, explosion or smoke-related notifiable event sub-categories

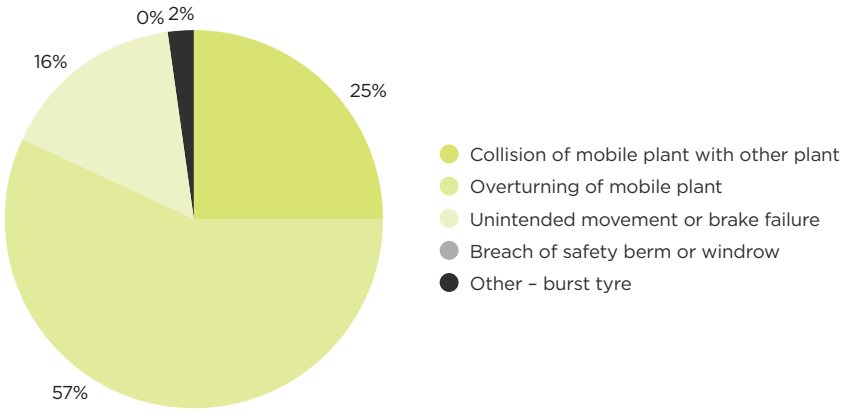

FIGURE 9: Vehicles and plant-related notifiable event sub-categories

Consistency of reporting

Mining and tunneling data are received from a high proportion of those operations and are considered to be accurate. Notifiable events were reported by 37% of operations in the past 12 months, and quarterly reports were submitted by 100% of operations this quarter.

Quarrying and alluvial mining data are received from a much lower proportion of those operations and are likely to be less accurate. Notifiable events were reported by just 4.5% of operations in the past 12 months. The SWIFT data on WAFW injuries consistently shows higher numbers of injuries in the quarry sector, suggesting under-reporting of events. More accurate reporting from the quarry sector is expected when the requirements for reporting under Schedules 5 and 8 are implemented for quarries.

This was the first quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe. Quarterly reports were provided by 11 alluvial mining operations (18%) and 274 quarries (29%).

2.5 Regulator comments

The data shown in the quarterly report is being adjusted as a response to the changes to reporting and notifications in the amended regulations. As all operations now report under the same regime, we have started to combine data from mining, tunnelling, alluvial mining, and quarrying operations to provide overall Extractives sector information.

We may on occasion still divide the data up to highlight relative sector performance if we see that there are differences. Historically the distribution of the types of notifiable incidents that have been reported by industry has seemed similar despite Quarries and alluvial mines reporting under the HSWA and mines and tunnels additionally reporting under the Schedule 5 categories. The one difference is that fires in an underground environment are typically considered to be HPIs whereas on the surface a fire on mobile plant is most often considered not to be an HPI.

WorkSafe are currently preparing follow up supplementary questions that we may request operators to answer following HPI notifications. To begin with, we will target vehicles and plant related notifiable HPI events, as this remains one of the highest frequency types of incident. If the operator undertakes a detailed investigation, there will be no requirement to ask the questions. Unfortunately, we see many substandard investigation reports, and too many conclusions of operator error being the root cause when it is obvious that in many of the instances organisational failures were the more significant factor. In the next quarterly report, we will give advice on how a good investigation should be conducted and some feedback on common failings we are seeing.

Our objective with the digging deeper into HPIs is to build up a better understanding of actual contributing factors to these types of events. Once we have disseminated the information and determined any relevant patterns, and have advice, we will present back to industry in this report.

An investigation will only provide good findings through an openminded assessment of failures, including honest consideration of what the organisation could have done better or differently. It is very rare for HPIs to be a result of human error only. If human error is an investigation conclusion, the unanswered question that needs to be addressed is: how was human error allowed to occur, and why were the consequences so significant?

2.6 High potential incidents

A high potential incident at a mine, quarry or tunnel is an event, or a series of events, that causes or has the potential to cause a significant adverse effect on the safety or health of a person.

High potential incidents – 2022/23 Q2

Table 5 provides a summary of high potential incidents notified to WorkSafe in Q2 2022/23. The summaries are an abridged version from the operator's notification report.

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Oct 22	ADT reverses into light vehicle on the overburden dump site – no injury incident. 40t ADT dumping material into windrows on the over burden site. Excavator hose repairs were happening with hose contractor working on the excavator at the time of incident. ADT contacts driver side rear wheel.	– Roads and vehicle operating areas – Contractor management – Job planning – Risk assessment – Supervision – Training
Oct 22	Unintended holing into old workings. Mining into an old waste pass underground – initially determined to be a cavity however as it was bogged out it was evident that it was an old pass that was not shown on historic plans.	– Tips, ponds and voids – Inundation and inrush – Survey – Risk assessment – Supervision – Training
Oct 22	Attempting to transfer product from IBC to basket with no product coming out of hose, inspected end of hose and identified end cap still in place. Two operators attempting to remove end cap. Pressure build up in discharge hose resulted in the end cap ejecting from hose causing minor injury to finger, with the product in the hose also ejecting under pressure contacting second operator in the face area, forcing glasses onto and causing minor laceration to face.	– Pressurised substances – Hazardous substances – Job planning – Risk assessment – Supervision – Training
Nov 22	The excavator swung excavator dipper arm around and hit one of the wires and broke it.	– Electricity – Exclusion zones – Job planning – Risk assessment – Supervision – Training
Nov 22	An underground haul truck rolled on to its side when maneuvering underground. No injuries were sustained to the driver. No other equipment or plant was involved.	– Roads and vehicle operating areas – Job planning – Risk assessment – Supervision – Training
Nov 22	CAT 771D dumper collided with stationary light vehicle utility vehicle at the Primary Plant. No one was injured	– Roads and vehicle operating areas – Job planning – Risk assessment – Supervision – Training
Nov 22	A low voltage messenger cable from a MTBM 1100m away was disconnected from a plug for the purposes of installing a new pipe. While handling the cable the Leading Hand Tunneller reported a shock. Assessed at scene and taken to hospital for checks. Released with no injuries.	– Electricity – Risk assessment – Supervision – Training
Nov 22	On entering the portal to the U/G mine, mobile plant has blown a hose spraying engine oil on the already hot engine, causing flames in the engine compartment. The fire was extinguished using the onboard AFFF system.	– Fire or explosion – Mechanical – Emergency management

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Nov 22	A 777 operator encountered a stretch of road which was strip watered. He lost traction of the vehicle and skidded. After failing to correct the skid the operator made contact with the windrow. He then called up his supervisor to report the incident. There was no damage to the machine or injury to personnel	– Roads and vehicle operating areas – Defect management – Risk assessment – Supervision – Training
Nov 22	Left front tyre on loader blew out with the bucket extended and full. Loader was approaching the main feed hopper on the plant at the time. No injury.	– Roads and vehicle operating areas – Maintenance – Mobile plant inspections – Risk assessment – Supervision – Training
Nov 22	Explosive product found in muckpile, suspected from previous blast. No injuries or damage to property. Assessment identified a deadpressed cartridge with a detonator that has fired and damaged the cartridge but not initiated it.	– Explosives – Site inspection – Risk assessment – Supervision – Training
Nov 22	Removed the tyres and the broken leaf spring from the RH side and was in progress of removing the left hand side wheels on fuel truck in workshop. At 02.50am this morning, I was in the supervisors office doing the hand over when I heard a bang and a bar falling over. I walked over to the fuel truck when I had noticed that it was on a significant lean. On inspection the rear jack stand was broken and the front one behind hose reels had pealed apart leaving the truck standing on the axel on the axel stands and chassis on the bump stops.	– Job planning – Change management – Maintenance – Risk assessment – Supervision – Training
Nov 22	Haul truck operator (contractor) was preparing to tip off material into waste disposal area. He reversed into space, stopped, started putting the hoist up and felt the cab tilting slightly. He put the hoist down, however the cab rolled. The driver was wearing a seatbelt (lap belt) but he thinks he may have hit an armrest as his ribs are a bit sore. Driver exited through the window.	– Roads and vehicle operating areas – Job planning – Risk assessment – Supervision – Training
Nov 22	An employee was undoing a pipe to remove the steering box from a light vehicle, he mistakenly loosened the wrong pipe and it was under pressure and released some oil and gas. The release of oil and gas was not in the direction of the employee.	– Pressurised substances – Energy isolation – Job planning – Maintenance – Risk assessment – Supervision – Training
Nov 22	Articulated dump truck driving through a dip in road with slight right hand turn, at beginning of uphill travel tray has tipped over to the left. Vehicle had to be righted and moved as blocking main route through quarry. Photos of scene taken and local power company called to oversee righting as event happened under powerlines. Vehicle locked out awaiting mechanical inspection at workshop since event.	– Roads and vehicle operating areas – Road design – Electricity – Emergency management – Risk assessment – Supervision – Training
Nov 22	Front end loader backed into dump truck.	– Roads and vehicle operating areas – Risk assessment – Supervision – Training

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Dec 22	Forestry quarry small slip happened in face opposite end of bench we were working on.	– Ground or strata instability – Site inspections – Risk assessment – Supervision – Training
Dec 22	Hand injury when glove has become caught by an electric drill. Glove has been ripped off causing skin loss cuts and burn requiring hospital attention.	– Job planning – Risk assessment – Supervision – Training
Dec 22	A dump truck driver, wanting position himself so that the truck can be loaded by a loader, connected with the loader bucket damaging the headboard. The loader operator, brought the bucket down to stabilise the loader and caused damage to the dump truck side rail and mirror as well.	– Roads and vehicle operating areas – Job planning – Supervision – Training
Dec 22	ADT dumper truck was tipping load onto access road. Was parked across slope and as bin was raised and the bin only tipped over. The cab remained upright. The dump was stationary, the excavator operator called on the RT radio to lower bin, but was not heard until too late. No injury to operator.	– Roads and vehicle operating areas – Job planning – Risk assessment – Supervision – Training
Dec 22	We have had a fall of ground at in a drive that was accessible but not active in the upper section of the mine. Initial investigation indicated that it was due to scat build up pushing through a split in the mesh. The risk of people being in the area is extremely rare due to it being non active. The surrounding area has been inspected and no other similar issues are present, we have barricaded off other non active drives in the area. Currently the FOG is barricaded off.	– Ground or strata instability – Site inspections – Risk assessment – Supervision – Training
Dec 22	ADT dump truck deck sunk in soft ground and tipped the deck onto its side while backing towards tip head. Cab maintained upright. Deck was not raised. No injury to people or damage to mobile plant.	– Roads and vehicle operating areas – Job planning – Risk assessment – Supervision – Training

TABLE 5: High potential incidents – 2022/23 Q2

Table 6 and figure 10 shows the number of high potential incidents per quarter during the last two years for all extractives operations.

QUARTER	Q3 JAN-MAR 2021	Q4 APR-JUN 2021	Q1 JUL-SEP 2021	Q2 OCT-DEC 2021	Q3 JAN-MAR 2022	Q4 APR-JUN 2022	Q1 JUL-SEP 2022	Q2 OCT-DEC 2022	TOTAL PREVIOUS 12 MONTHS
Number of high potential incidents per quarter	23	16	21	23	28	20	27	22	**97**

TABLE 6: High potential incidents per quarter

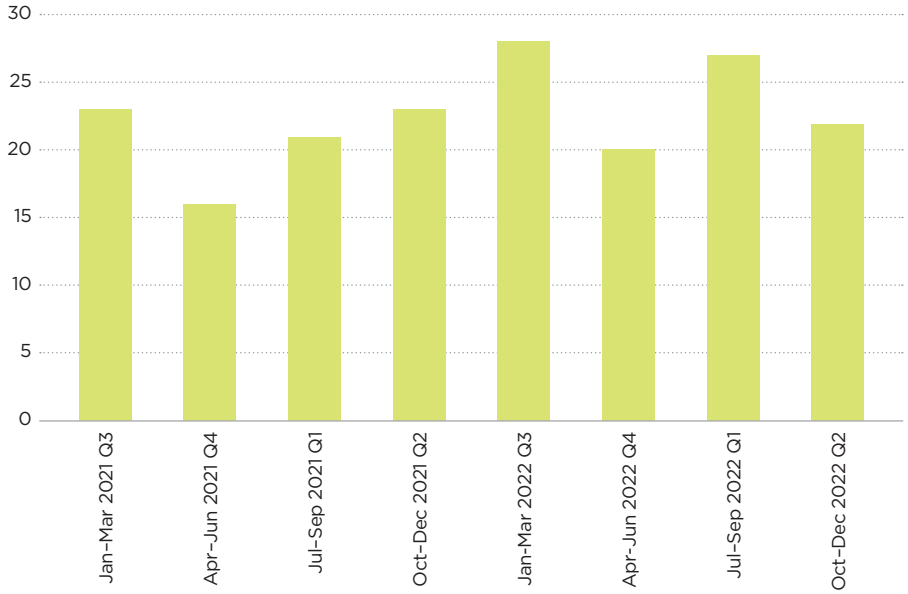

FIGURE 10:
Number of high potential incidents per quarter

2.7 High potential incidents – investigation outcomes

High potential incident case study – heavy vehicle versus light vehicle collisions

Oct 22	ADT reverses into light vehicle on the overburden dump site – no injury incident. 40t ADT dumping material into windrows on the over burden site. Excavator hose repairs were happening with hose contractor working on the excavator at the time of incident. ADT contacts driver side rear wheel.
Nov 22	CAT 771D dumper collided with stationary light vehicle utility vehicle at the Primary Plant. No one was injured.

TABLE 7:
High potential incident – investigation outcomes case study

INCIDENT 1

Waste material was being moved to an overburden dump site using a 40t articulated dump truck (ADT). The excavator had blown a hydraulic hose and was being fixed at the site. The contractor's light vehicle was parked beside the excavator for repair.

While reversing, the ADT lost sight of the light vehicle, resulting in the ADT contacting the driver's side rear wheel. The impact caused the light vehicle to move half a metre and caused light panel damage and hose press damage. The contractor was working on the excavator at the time. The job site stopped and the incident was investigated.

FIGURE 11:
Photograph of incident (recreated)

The investigation identified

The cause of the incident was attributed to:

- Contractor management – ineffective tip head management
  - There is a mix of hands on work and written instructions around the management of the tip head. There have been no other incidents around this management process. The process is clear and understood, but lacks being completely documented.
  - Inductions lacked depth (setting expectations and standards) example; on how we operate on-site (when breakdowns occur are also not clearly defined etc).
- Communication and consultation
  - The breakdown had been communicated to the team during the toolbox talk at 0700hrs. It's unsure if the 2way radios were ineffective or effective at the time as they have not been serviced or inspected for some time. The driver states they didn't hear all the call outs on the radio to warn of oncoming collision.
  - Unfamiliar environment to the new driver on site as this was their third day of work at the site. However, has many years of experience to earth-moving operations. The driver was under a buddy driver/ supervisor for the first day of work.

Key learnings identified

Ensuring that we have a clearly documented and communicated process on site of how we manage our sites. Including but not limited to a robust induction process, permit to work, communications plan, traffic management plans and any other documentation that may add value to the task, for example, aerial pictures, diagrams etc.

INCIDENT 2

An operator was hauling in a dumper truck from the primary plant to a location within the quarry floor.

After arriving at the primary plant, the operator started to back up beside a stationary ute under the primary plant conveyor to receive a load. Once the bin was emptied, the operator started turning right and in doing so contacted the front left side of the light vehicle which was stationary at the time of impact. There were no persons in the stationary vehicle at the time of contact.

FIGURE 12: Photograph of incident scene

The investigation identified

The investigation identified the following contributing factors:

- parking a light vehicle in a proximity to the loading and heavy vehicle operating area
- not using both mirrors, front and right side
- visual impairments, right hand side, and front right corner blind spot
- standard loading procedure for loading in material, to constantly review the load as it enters the bin, stopping the cover belt each time allowing the plant to moved forward to spread the load evenly in the bin
- the dumper only had one half load – if a full load was received then the dumper would have moved forward and potentially passed by the front of the vehicle
- human error – as part of the investigation process it was noted that this incident was a result of an error (slips) in judgement in which the right intention or plan is incorrectly carried out. This usually occurs during well-practiced and familiar tasks, that is, vehicle entering a loading area, reversing back towards the conveyor, receiving the material, leaving, and returning. The task at hand was routine work that was to be carried out and had been done every other day
- training – the operator had not received the appropriate training for operating plant in the quarry
- the operator had just replaced another operator and continued with the operation; this was the first load out with the light vehicle near the dumper.

Regulator comments and recommendations

CONTROLLING LIGHT AND HEAVY VEHICLE INTERACTIONS

Every site is different and likely to present different hazards and risks. Safe workplaces are achieved by separating pedestrians and vehicles, light and heavy vehicles, and providing hazard-free vehicle routes.

The hierarchy of controls for controlling light and heavy vehicle interactions is:

1. separation (different haul road)
2. segregation (bund separation on same haul road)
3. administrative controls.

Light vehicles are at risk of being crushed by heavy vehicles. They should be kept away from areas where heavy vehicles operate. Where this is not practicable they should be fitted with rotating or flashing beacons, high visibility ‘buggy whips’, high visibility and reflective markings and other appropriate measures. This makes them readily visible to drivers of other vehicles. The use of vehicle hazard lights alone is not deemed adequate and should be discouraged.

For light vehicles expected to enter areas where heavy vehicles are operating, consider the following controls during your risk assessment:

- establish exclusion zones around heavy vehicles
- heavy vehicles are to remain stationary when light vehicles are within exclusion zones
- the impact on environmental conditions on visibility (for example, darkness, fog or rain)
- fit vehicles with rotating or flashing orange warning lights, visible 360 degrees
- from the vehicle, unless multiple lights are fitted to cover blind spots and fit with reflective strips

- fit radios so drivers can communicate with site supervisors or directly to heavy vehicle drivers.
- fit a warning flag (buggy whip) which can be seen by the operator of the tallest vehicle
- fit clearly visible numbering, or an alternative form of positive identification, as an aid for two-way communication between heavy vehicle and light vehicle drivers
- light vehicle visibility controls should apply to all light vehicles (for example, contractor or visiting drivers where they are required to enter operational areas).

Further information

WorkSafe's good practice guidelines:
Health and Safety at opencast mines, alluvial mines and quarries

- Section 5: Planning for roads and vehicle operating areas
- Section 11: Traffic management

Thank you to Fulton Hogan for making the video they created to demonstrate the effects of a heavy vehicle vs light vehicle collision available for distribution to industry. The video was shown to all Fulton Hogan staff to show the importance of light and heavy vehicle separation, good visibility, communication and safety zones.

FIGURE 13:
Image from Fulton Hogan demonstration video

3.0 Regulatory insights

IN THIS SECTION:

3.1 When does best practice become industry normal?

The mining, tunnelling and quarrying sector vary in size and complexity, meaning the risk profiles of sites also differ. The variations include factors such as geology, tonnage, machinery used, extraction methods and worker numbers. And some businesses (PCBU's) have more than one operation so the actual business arrangements can be more complex than more simple owner operator sites. This can result in different 'businesses' managing similar risks differently to each other.

So how does your business know if it is doing enough to manage a particular risk, or if you are choosing the correct risk management controls? When does a good idea to manage risk move from just being a good idea, to a standard practice which WorkSafe may use as an example to prove whether a business has managed risk so far as is reasonably practicable? The Health and Safety at Work Act 2015 defines reasonably practicable and legal advice is useful when applying the term to your situation.

There are a few things to consider when deciding whether a risk control is reasonably practicable to take. All relevant factors should be considered as well as the obvious, that is, can it be done? Some relevant factors are:

a. the likelihood of the hazard or the risk concerned occurring
b. the degree of harm that might result from the hazard or risk
c. what do you or others in the industry know about the risk and how to manage it
d. the availability and suitability of ways to eliminate or minimise the risk.

Only after considering the factors above, do you weigh up whether the cost is grossly disproportionate to the risk.

The other good rule of thumb for managing risk is the greater the consequence, the more you should invest in managing the risk. A factor many businesses struggle with is deciding if the cost of a particular risk control is grossly disproportionate to the risk. What if you decide not to adopt a particular control due to the high cost?

It is important to remember that the cost you should be prepared to incur should not be considered against your ability to pay, but rather against the potential consequence of the risk. If there is a risk someone may be killed then accepting a larger cost to avoid the death is reasonable, especially if other businesses are using the control. The argument that you have set aside a good risk control option due to cost, because you can't afford it, when others have, would not be a strong defense.

So when does good practice become normal practice? The answer is not straight forward however the size of your business should not matter if a risk control has been proven to prevent a serious accident or fatality.

If a practice that once was considered best practice, for example, installing handrails on heavy mobile plant, but now you see the control widely applied and even retro-fitted, that practice has now become normal and considered reasonably practicable in most circumstances.

A key message to take away from this article is that risk management needs regular reassessment to check whether new solutions to prevent harm are available, reasonable, and mainstream.

Summary of things to consider are:

- Should you be undertaking the activity if you can't afford to manage the risk to the extent other companies do?
- Risks can be managed by more than one form of control, but in general you should ensure that the control you choose is equal to, or better, than other controls that are considered reasonably practicable by many operators.
- Using new technology can introduce additional risks. You need to assess the final risk level and confirm that you have in fact reduced risk to a reasonably practicable level.
- Is the risk control widely used or experimental? It may be that there are potentially better controls, but as yet they are not proven or there has not been sufficient evidence of effectiveness to justify adopting the control. BUT as time goes on, the evidence may confirm the control as indeed being effective, and it may become the standard to consider all options against.
- Would it be reasonable to defend your decision not to spend money on a proven superior control? Did you assess cost as the last consideration?

Dave Bellett

Deputy Chief Inspector Extractives

4.0
The regulator

IN THIS SECTION:

4.1 Our activities

The Extractives Specialist Health and Safety Inspectors at WorkSafe use a range of interventions to undertake their duties. Inspectors strive to achieve the right mix of education, engagement and where required enforcement. This section of the report includes a summary of the interventions used by the Extractives Inspectors during the quarter.

4.2 Assessments

Proactive assessments aim to prevent incidents, injuries and illness through planned, risk-based interventions. Reactive activities are undertaken in response to reported safety concerns or notifiable events. Assessments can be either site- or desk-based in nature.

For proactive site-based assessments, the objectives of each visit are agreed and the appropriate inspection tool is selected. Targeted assessments and regulatory compliance assessments can take several days on site with a team of inspectors attending. These multi-day inspections may be 'targeted' to assess the controls in place for a particular principal hazard (for example, WorkSafe has been targeting 'roads and other vehicle operating areas' as a result of the high number of notifiable events in this area), or they may involve a more general assessment of 'regulatory compliance'. Site inspections and targeted inspections are generally completed in a one day site visit but can also focus on specific topics.

As well as site-based assessments, the Inspectors spend considerable time undertaking desk-based assessments. Proactive desk-based assessments include the review of Principal Hazard Management Plans (PHMPs), Principal Control Plans (PCPs), mine plans, and high risk activity notifications. Responding to notifiable events and safety concerns may involve a site-based or desk-based assessment, or both.

Table 8 shows the range of assessments undertaken in Q2 2022/23 by sector.

		ASSESSMENTS	MINE	TUNNEL	ALLUVIAL MINE	QUARRY
Preventative	Site-based	Targeted assessments				
		Regulatory compliance assessments			4	
		Site inspections	7	9	7	40
		Targeted inspections				
	Desk-based	PHMP/PCP review		5		
		Mine plan review	6	4		
		High risk activity				
Reactive	Site-based	Concerns – inspection				1
		Notifiable events – inspection	2			7
	Desk-based	Concerns – desk-based				1
		Notifiable event – desk-based	17	4	2	3

TABLE 8: Proactive and reactive site and desk based assessments conducted in Q2 2022/23

Figure 14 shows the number of proactive and reactive site- and desk-based assessments undertaken by the regulator in Q2 2022/23. This quarter 61% of our activities were site-based, and 69% of activities were proactive.

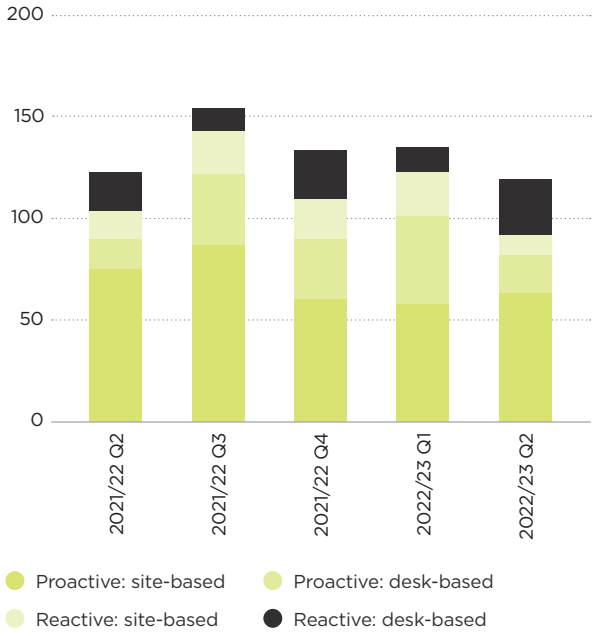

FIGURE 14:
Proactive and reactive site and desk-based assessments

Figure 15 shows the number of assessments undertaken by the regulator in Q2 2022/23 by sector. This quarter, 44% of our assessments were for quarries, 27% for mines, 18% for tunnels and 11% for alluvial mines.

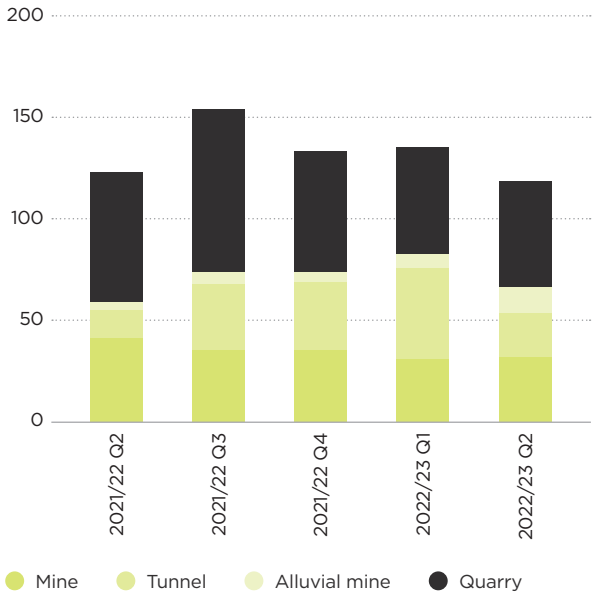

FIGURE 15:
Assessements by sector

4.3 Enforcements

Enforcement actions issued by WorkSafe include prohibition and improvement notices and directive letters. Enforcement actions are issued according to our Enforcement Decision Making (EDM) Model when health and safety issues are identified through assessments.

Figures 16 and 17 show the number of enforcement actions issued in Q2 2022/23 by notice type and by sector. This quarter, a total of 168 enforcement actions were issued. Of those, 4% of were prohibition notices, 19% were improvement notices, 77% were directives and 1% were sustained compliance letters. The majority of the enforcement actions were issued to the alluvial mining (20%) and quarrying (50%) sectors.

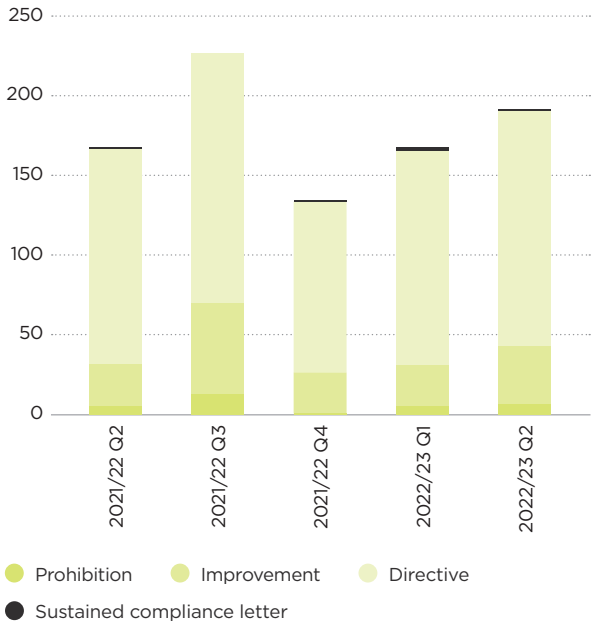

FIGURE 16: Enforcement actions issued by type

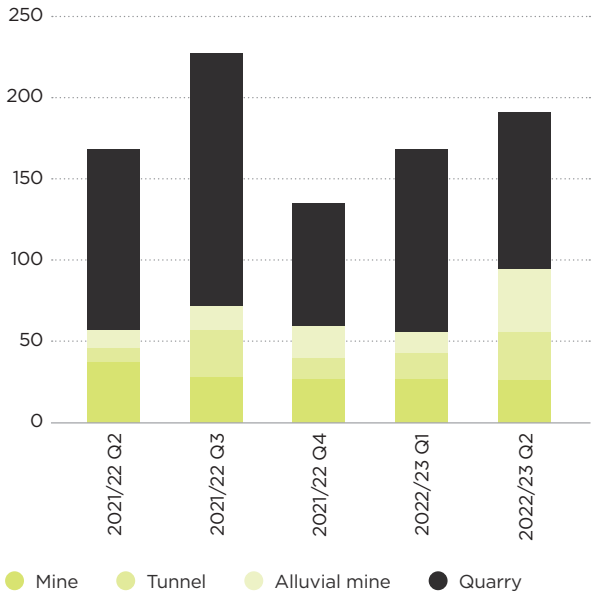

FIGURE 17: Enforcement actions issued by sector

Figure 18 shows the number of enforcement actions issued in Q2 2022/23 by category, and provides an indication of the key areas of concern to our inspectors. This quarter, the majority of enforcement actions were issued for health and safety issues relating to roads and other vehicle operating areas (24%), guarding (18%) and Health and Safety Management System (10%).

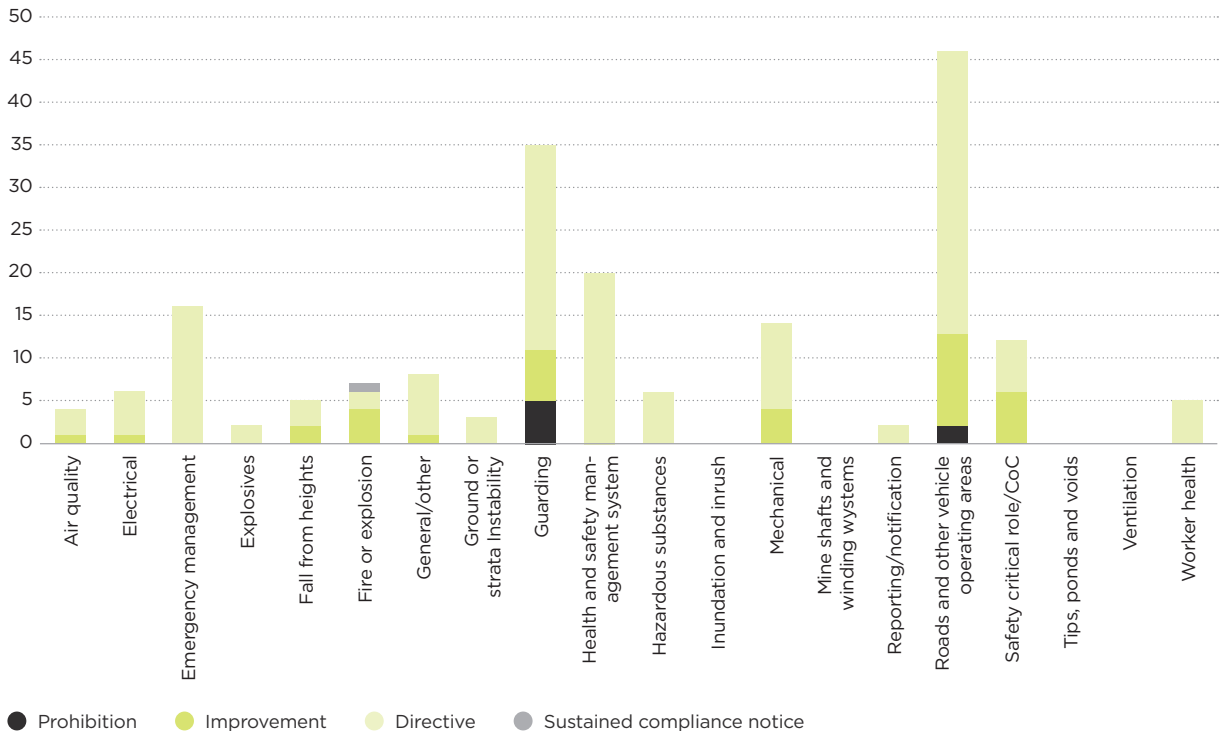

FIGURE 18: Enforcement actions issued by category 2022/23 Q2

Regulator activity comment

The extractives inspectors have continued to maintain inspection numbers over the quarter while also increasing the time allocated to preparing engagement material, and the giving of advice to operators related to introduction of the amended regulations.

During Q3 and Q4 the inspectors will all be participating in delivery of workshops which explain the development of Health and Safety management systems aligned to the amended regulation requirements.

General updates were completed for all of Industry through IoQ regional meetings, but it was identified that Industry would benefit if more targeted sessions were held for the smaller operators.

WorkSafe will continue to engage and educate on these issues. Our observation is that many operators are conversant with the new requirements and compliance will be achieved quite simply, but there remains a significant portion of industry who have not yet understood the step up in the regime.

Ignorance of the requirements is no excuse, so WorkSafe strongly recommend that those who do not feel they fully understand what is now required should make time to attend these workshops or contact the local Extractives inspector to get clarity.

Disclaimer

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