

# Extractives industry

2022/23 Q4

April to June



Te Kāwanatanga o Aotearoa  
New Zealand Government

**WORKSAFE**  
Mahi Haumarū 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.

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# 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.**

This Quarter 4, 2022-23 industry report comes after the completion of another yearly reporting cycle. As any organisation should do, it is important that we review the results and look at achievements and failures. We recognise that the information that is presented each quarter should not only be considered interesting, but that the information can also be useful and help all of us to determine the best strategies to improve health and safety in our industry.

The reporting year was more settled than the previous COVID affected years, but for our industry there was a significant event – the stage one Mining and Quarrying regulation revisions came into effect in the first month of the reporting period (July 2022). The regulation changes made little difference to mines and tunnels, but there were several new requirements for quarries and alluvial mines. For the first time these operations fell under the full requirements of the regulations – where previously the regulations had only dealt with quarry and alluvial mine competencies.

Looking at the year, the new regulation implementation should generally be considered a success with most operators actively implementing the required changes. WorkSafe inspectors arranged and hosted workshops or attended many existing engagements to discuss the regulations and to give our advice on developing compliant Health and Safety systems. The feedback received from participants of these workshops was all positive, and due to this success, WorkSafe has planned to complete another series of these events in this reporting year to further assist operators and managers in system development,

with the workshops also including advice on stage 2 and 3 regulation changes.

The review of the year's incident reporting data confirmed that most HPIs are still occurring in the Vehicles and Plant area, with overturning and collision the highest proportion of type of incident. There was an increase in ground stability and geotechnical related incidents. This may be related to weather – heavier than usual rain impacting on slope stability.

The stats do not show any discernable reduction in the frequency of HPI incidents. While the numbers are disappointing, they also confirm for us the areas we must focus on. This year we intend to focus very much on plant operator competence. Almost all investigations into the causes of plant related incidents identifies competence issues contributing. This is not to say that the incident is a result of operator error. Our focus will be on the standard of training, the standard of assessment, how plant operators are reassessed to ensure they remain competent etc. 'Operator error' is often cited, but the root cause is often an outcome of inadequate training in the first place.

We have decided to try to establish what good currently looks like in industry, and to then set out what standard training programs should look like for all operators. Some operators have already been asked to provide us with details of their training processes.

I would request that you all cooperate.



A handwritten signature in black ink, appearing to read 'Paul Hunt'.

**Paul Hunt**  
Chief Inspector Extractives

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# 1.0 Industry profile

## IN THIS SECTION:

- 1.1 Operations
- 1.2 People
- 1.3 Developing competence

## 1.1 Operations

3

### Metalliferous opencast mines

Includes one mine under rehabilitation

20

### Coal opencast mines

Includes one mine in care and maintenance and one mine under 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

6

### Tunnels

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

4

### Coal exploration

Four operational coal exploration projects

67

### Alluvial mines

Number of mines that have been verified (57) or have notified of an Appointed Manager to WorkSafe (10) (includes 2 iron sands mines)

974

### Quarries

Number of quarries that have been verified (834) or have notified of an Appointed Manager to WorkSafe but not yet verified (140)

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 1,081 active operations in New Zealand as at the end of June 2023.

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

# 658

### Metalliferous opencast mines

477 FTEs employed by mine operators and 181 FTEs employed by contractors

# 755

### Coal opencast mines

619 FTEs employed by mine operators and 136 FTEs employed by contractors

# 248

### Metalliferous underground mines

219 FTEs employed by mine operators and 29 FTEs employed by contractors

# 0

### Coal underground mines

0 FTEs employed by mine operators and 0 FTEs employed by contractors

# 277

### Tunnels

232 FTEs employed by mine operators and 45 FTEs employed by contractors

# <1

### Coal exploration

2 workers employed by mine operators worked 140hrs and 1 worker employed by contractors worked 20 hours

# 445

### Alluvial mines

Number of workers is known for 42 of the 67 alluvial mines that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 25 operations

# 3,151

### Quarries

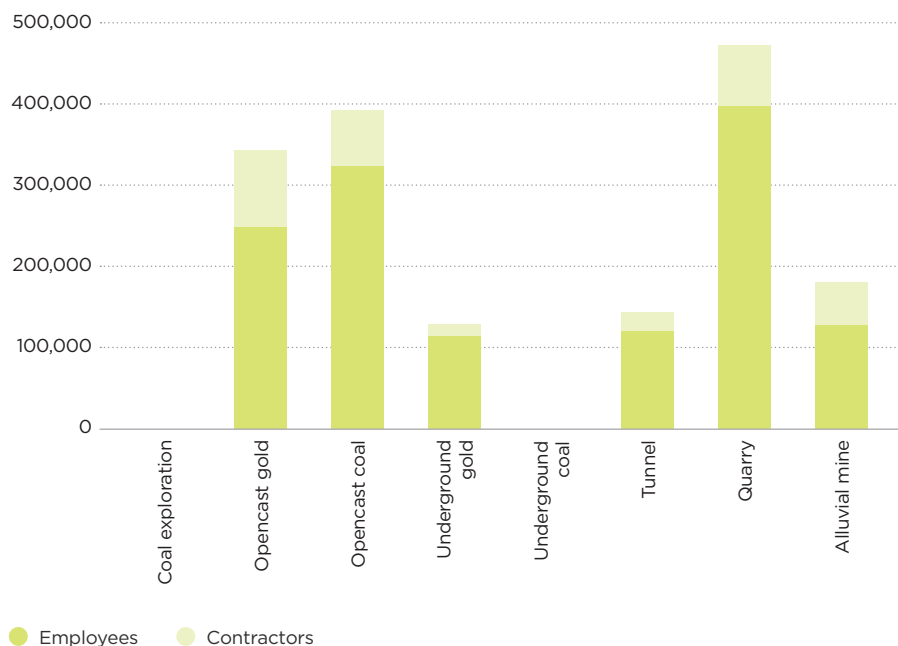
Number of workers is known for 745 of the 974 quarries that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 229 operations

There were 5,534 Extractives FTEs in New Zealand as at the end of June 2023. 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.

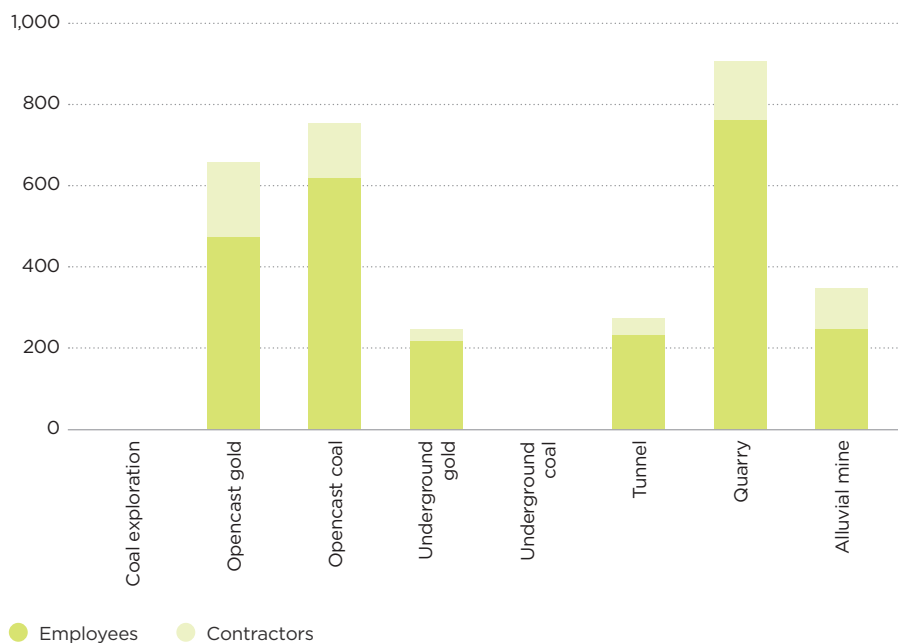
This was the third quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe. Quarterly reports were provided by 11 alluvial mining operations (16%) and 199 quarries (20%). That is the reason for the significant difference between the extrapolated 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 Q4 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 Q4

Figure 2 shows the number of Full Time Equivalents (FTEs) calculated from total hours worked that were reported to WorkSafe in quarterly reports for Q4 2022/23. The hours are separated into Employees and Contractors.



**FIGURE 2:**  
Number of FTEs by sector 2022/23 Q4

### 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).

Applicants for Board of Examiners members will be sought during September and as this process is undertaken it is considered that explanation of the responsibilities and membership of the Board of Examiners would be a useful reminder to Industry.

The Board of Examiners functions and makeup is stated in the Health and Safety Act 2015 as follows:

#### 28 Functions of Board

The functions of the Board are:

- a. to advise WorkSafe on competency requirements for mine workers
- b. to examine applicants, or have applicants examined, for certificates of competence
- c. to issue, renew, cancel, and suspend certificates of competence
- d. any other function relating to training and competency requirements for participants in the extractives industry conferred on the Board by regulations made under this Act.

#### 29 Membership of Board

1. WorkSafe may at any time appoint a member of the Board.
2. The appointment of a member of the Board must be for a specified period.
3. WorkSafe must appoint one of the members of the Board as the chairperson of the Board.
4. When appointing a member of the Board, WorkSafe must have regard to the need to ensure that the Board has among its members knowledge and experience of:
  - a. mining operations
  - b. health and safety inspection in the mining industry
  - c. mining education
  - d. mining industry training.
5. Without limiting subclause (4), the Board may include 1 or more employees of WorkSafe.

The process for selecting the board members is usually undertaken by a panel which includes independent persons from Industry. They are required to ensure that, as well as selecting suitable board members, that the board has the appropriate mix of members as required in the Act.

Board members normally have a three year term and are then obliged to reapply at the end of the term if they wish to continue on the Board of Examiners. Many members do choose to reapply, and this is appreciated as the experience that members bring in their subsequent terms improves the function of the Board.

The board members work very hard on behalf of Industry, with the last two years being unusually busy with regulation changes and the requirement of the BoE to put into effect some of the revisions.



**FIGURE 3:**

Current Board of Examiners members  
 L to R: – Matt Mules, Steve Bell, Tim Kennedy,  
 Mark Pizey, Brian Bouzaid, Paul Hunt, Garth Elliot,  
 Michelle Crompton, Fiona Bartier, Bernie O’Leary,  
 Dinghy Pattinson

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

TOTAL NUMBER OF ORAL EXAMS HELD Q4 APR–JUN 23	TOTAL PASSES	SUCCESS %
26	23	88.5

**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 Q4 2022/23.

**Note:** We no longer report Life Time CoCs.

COC TYPE	TOTAL COCs RENEWED Q4 Apr–Jun 2023	TOTAL NEW COCs ISSUED Q4 Apr–Jun 2023	TOTAL NUMBER OF CURRENT COCs
A Grade Quarry Manager	8	6	256
B Grade Quarry Manager	8	8	372
A Grade Opencast Coal Mine Manager	0	1	54
B Grade Opencast Coal Mine Manager	3	5	55
A Grade Tunnel Manager	1	1	37
B Grade Tunnel Manager	2	1	75
Site Senior Executive	3	1	51
First Class Coal Mine Manager	0	0	16
First Class Mine Manager	2	0	18
Coal Mine Deputy	0	0	28
Coal Mine Underviewer	0	0	19
Mechanical Superintendent	1	0	22
Electrical Superintendent	1	0	18
Ventilation Officer	0	0	4
Mine Surveyor	0	0	13
Site Specific	0	0	4
Winding Engine Driver	0	0	0
<b>Total</b>	<b>29</b>	<b>23</b>	<b>1,042</b>

**TABLE 2:** Certificates of Competence in circulation



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## 2.0 Health and safety performance

### IN THIS SECTION:

- 2.1 Notifiable events
- 2.2 Injuries
- 2.3 Types of events
- 2.4 Extractives sector focus areas
- 2.5 Regulator comments
- 2.6 High potential incidents
- 2.7 High potential incidents  
- investigation outcomes

## 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, Q2, Q3 and Q4 of 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	2022/23 Q3	2022/23 Q4
Number of notifiable events	20	18	20	24	21	21	17
Number of operations that notified events	11	9	11	7	9	12	11

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

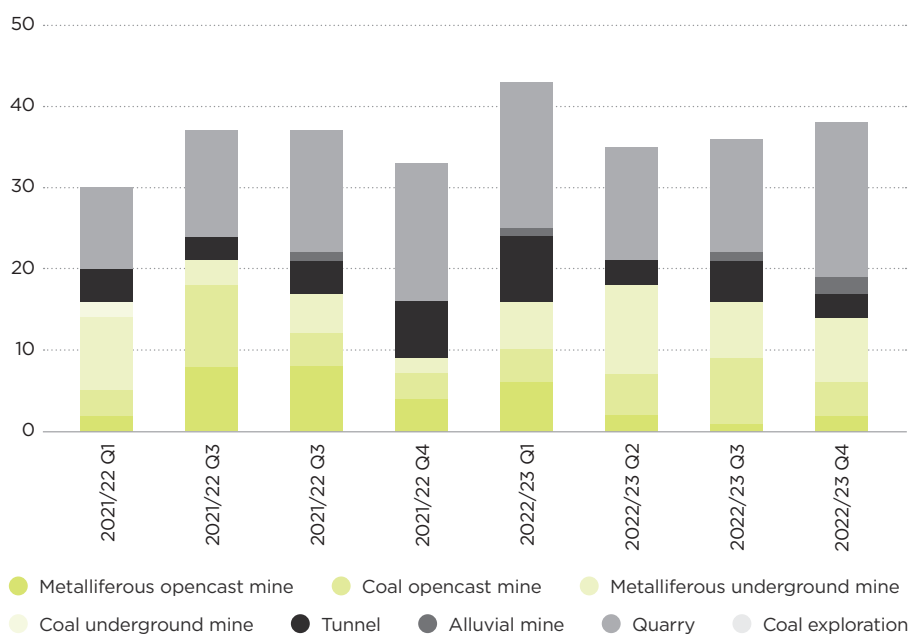
Eighteen individual mines and tunnels from a total of 40 reported notifiable events in the past 12 months.

QUARRIES AND ALLUVIAL MINES	2019/20 QUARTERLY AVERAGE	2020/21 QUARTERLY AVERAGE	2021/22 QUARTERLY AVERAGE	2022/23 Q1	2022/23 Q2	2022/23 Q3	2022/23 Q4
Number of notifiable events	18	16	14	19	14	15	21
Number of operations that notified events	15	12	13	18	13	15	15

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

Fifty-one individual quarries and alluvial mines from a total of 1,041 reported notifiable events in the past 12 months.

Figure 4 shows the number of notifiable events reported to WorkSafe by sector from July 2021 to June 2023.



**FIGURE 4:** Notifiable events by sector

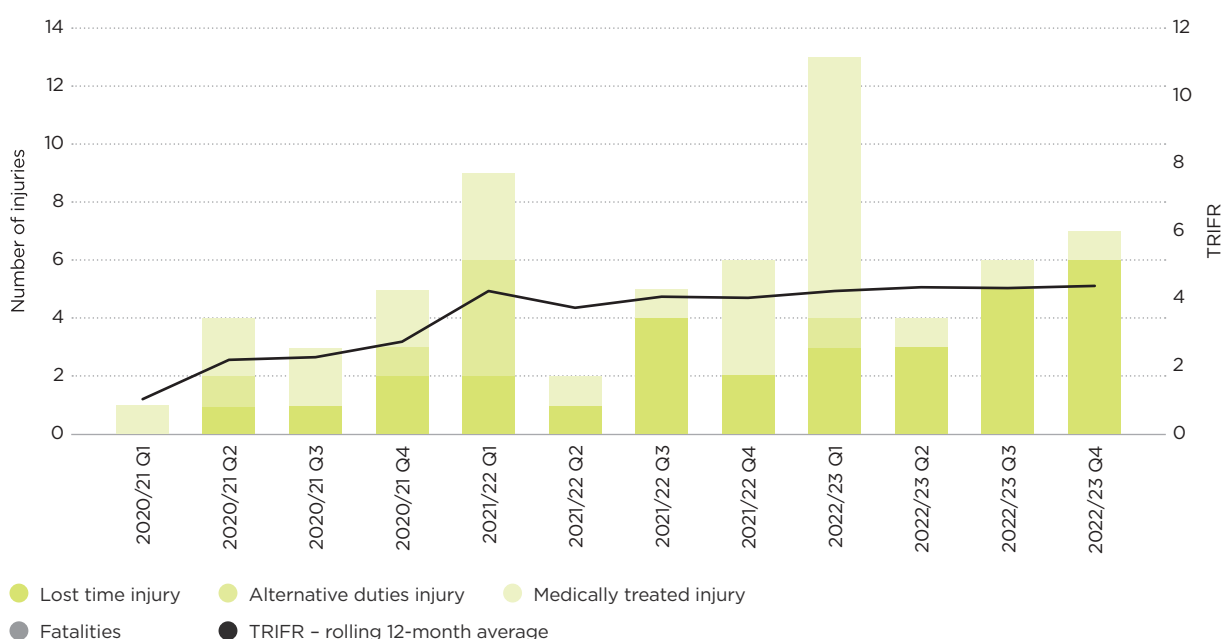


## 2.2 Injuries

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 third quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe.

Figure 5 shows the number of injuries by injury type reported to WorkSafe from July 2020 to June 2023. 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.

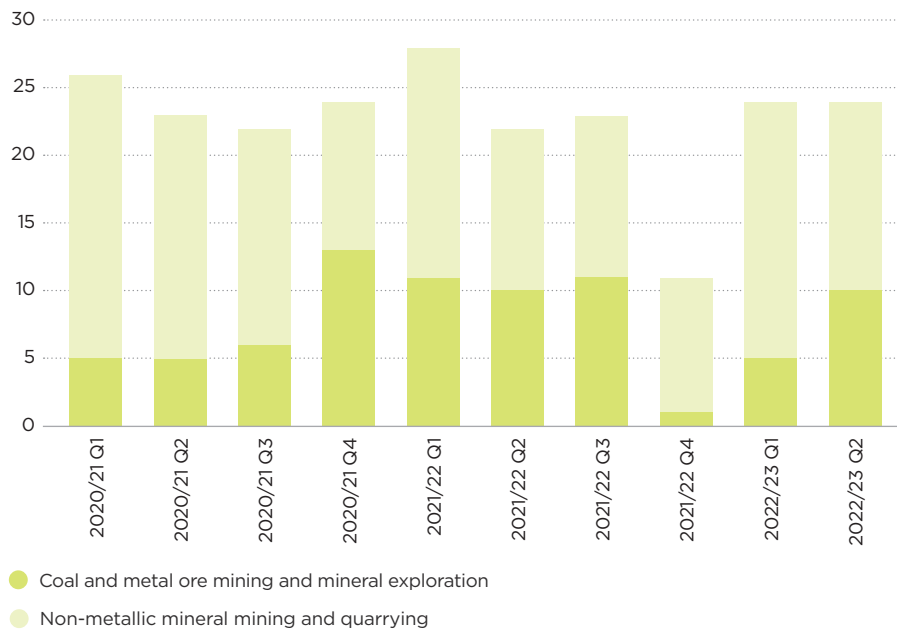


**FIGURE 5:** TRIFR

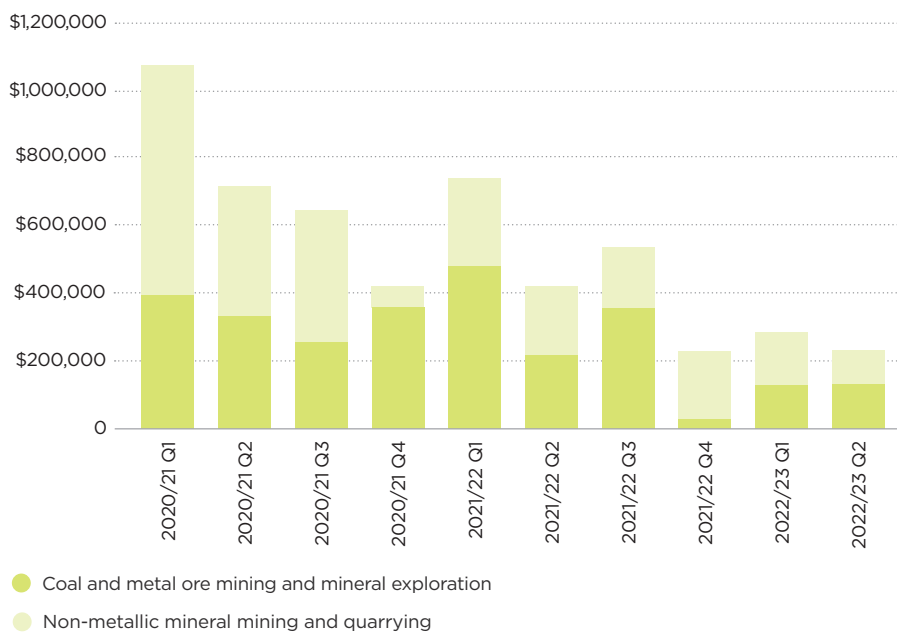
The following injury definitions are taken from Schedule 8 of the Regulations:

- **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 6 and 7 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 October 2020 to March 2023. 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 October 2020 to March 2023 was over \$23100 per injury.



**FIGURE 6:**  
Number of injuries resulting in more than a week away from work

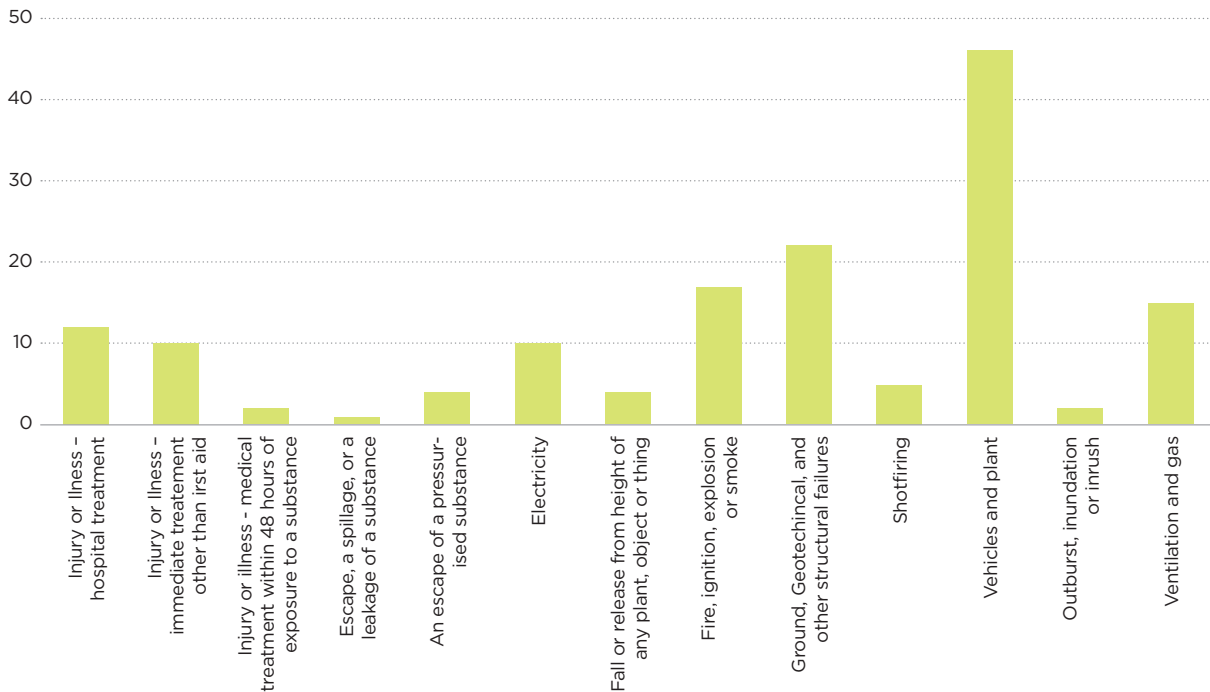


**FIGURE 7:**  
Sum of claims cost (excluding GST) for injuries resulting in more than a week away from work

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 a 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 8 shows the notifiable event categories for events notified to WorkSafe in the previous 12 months. The data shows that 42 percent of notifiable events in the past 12 months have occurred in relation to vehicles and plant (31%), and fire, ignition, explosion or smoke (11%). These two categories are broken down in more detail in the following section. A further 15% of notifiable events in the past 12 months occurred in relation to ground, geotechnical and other structural failures.



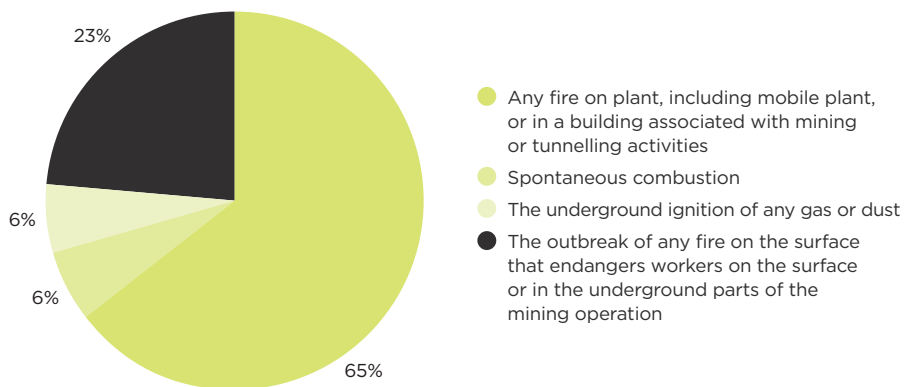
**FIGURE 8:** Notifiable event categories for the previous 12 months



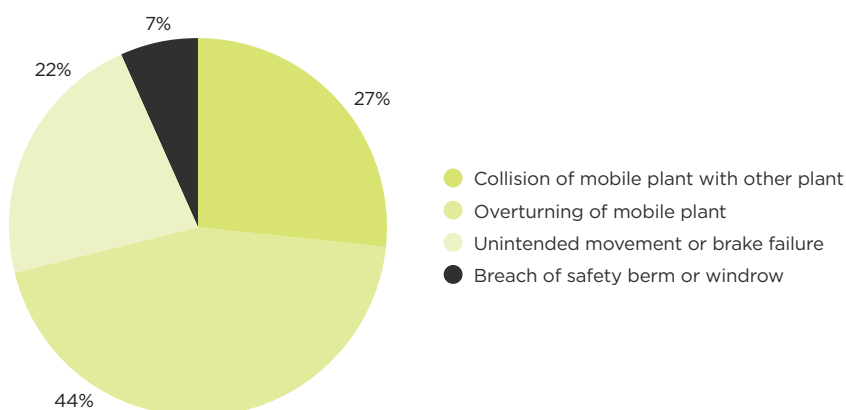
## 2.4 Extractives sector focus areas

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 9 and 10 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, 65% involve fires on plant, mobile plant or in buildings associated with mining or tunnelling activities, 6% involves spontaneous combustion, 6% involves the underground ignition of any gas or dust and 23% 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 (27%), overturning of mobile plant (44%), breach of a safety berm or windrow (7%), and unintended movement or brake failure (22%).



**FIGURE 9:**  
Fire, ignition, explosion or smoke-related notifiable event sub-categories



**FIGURE 10:**  
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 45% 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 4.9% 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 third quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe. Quarterly reports were provided by 11 active alluvial mining operations (16%) and 199 active quarries (20%). Last quarter 12 active alluvial mining operations and 227 active quarries submitted quarterly reports.

Additionally, the number of quarterly reported received from quarrying operations that reported 0 hours worked was 55 (last quarter this number was 92) .

The total number of quarrying operations that submitted a quarterly report this quarter was 254 (last quarter this number was 319).

## 2.5 Regulator comments

The assessment of risk is mandatory in all activities in our sector. Once risks have been assessed, the operator then implements controls to reduce the raw risk down to an acceptable level. This residual risk level may be low or moderate depending on the activity. The selection of controls implemented should be proportionate to the raw risk identified, and consistent with the hierarchy of controls. If there is serious foreseeable risk to the health or safety of workers, then controls should be robust. It is raw risk that often determines the amount of resource time and effort that is allocated to the risks identified.

So, this first assessment of the raw risk is critical to establishing the most important issues to address at any operation. But unfortunately, the nature of many risk assessments can be subjective, and as a result we see significant variations in what risk assessments determine and what controls are considered to be appropriate.

The Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 state:

### 5. Duty to identify hazards

**A PCBU, in managing risks to health and safety, must identify the hazards that could give rise to reasonably foreseeable risks to health and safety.**

During risk analysis, when using a tool such as a 5x5 risk matrix (Figure 11), the assessment of a reasonably foreseeable consequence is the first assessment, and the potential probability of that event occurring is the second consideration.

**FIGURE 11:** Example of a 5x5 risk matrix

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Extreme
<b>LIKELIHOOD</b>	<b>Almost certain</b> - The event is expected to occur in most circumstances - At least once or more within 12 months - Experience/observed: Occurs regularly here	Medium 5	Medium 10	High 15	Critical 20	Critical 25
	<b>Likely</b> - There is a strong likelihood the event will probably occur in most circumstances - Once every 1-2 years - Experience/observed: Has occurred here more than once or is occurring to others in similar circumstances	Low 4	Medium 8	High 12	High 16	Critical 20
	<b>Possible</b> - It is possible that the event might occur at some time. - Once every 2-5 years - Experience/observed: Has occurred here before or has been observed in others in similar circumstances	Low 3	Medium 6	Medium 9	High 12	High 15
	<b>Unlikely</b> - Not expected. There is a chance the even could happen sometime - Once every 5-7 years - Experience/observed: Has occurred infrequently before to others in similar circumstances, but not here	Low 2	Low 4	Medium 6	Medium 8	Medium 10
	<b>Rare</b> - May happen only in exceptional circumstances - Experience/observed: More than 7 years	Low 1	Low 2	Low 3	Low 4	Medium 5

		INSIGNIFICANT	MINOR	MODERATE	MAJOR	EXTREME
<b>HEALTH, SAFETY AND WELLBEING</b>	<b>Safety</b> - Pain/discomfort not requiring treatment	<b>Safety</b> - Minor injury - first aid treatment required	<b>Safety</b> - Injury requiring emergency medical treatment	<b>Safety</b> - Injury requiring time off work for recovery - Major injury/long term incapacity or disability (for example, loss of or use of a limb)	<b>Safety</b> - Fatality, permanent incapacity or disability/life-changing harm	
	<b>Physical health</b> - Illness not requiring treatment	<b>Physical health</b> - Minor illness - treatment required	<b>Physical health</b> - Minor or temporary impairment due to illness - Health exposure requiring immediate medical assessment	<b>Physical health</b> - Acute but reversible illness requiring specialist treatment	<b>Physical health</b> - Chronic life-changing illness causing incapacity	
	<b>Mental health</b> - Nil or negligible impairment of psychosocial function up to two days	<b>Mental health</b> - Minor short-term impaired psychosocial function ≥3 days but <1 month	<b>Mental health</b> - Impaired psychosocial function ≥1 month and <6 months - Manager referral to EAP and/or support services	<b>Mental health</b> - Impaired psychosocial function ≥6 months - Recovery <6 months - Requiring medical treatment and/or counselling	<b>Mental health</b> - Recovery ≥6 months - Permanent psychosocial incapacity - Fatality	

As a simple example of how the outcome of a risk assessment can be undermined by subjective opinion, we can calculate risk related to a common occurrence in our industry – the rollover of a piece of mobile plant.

The Regulator sees mobile plant rollover HPIs regularly where vehicles or plant has overturned, and the potential for serious harm is very apparent. The regulator also, from time to time, also sees fatalities related to these types of events.

When assessing the raw risk of mobile plant rollover, it is obvious to the Regulator that serious harm or a fatality is a reasonably foreseeable outcome, and the likelihood of an event like this occurring is likely or almost certain.

But a small operator might not have experienced any rollover events and therefore doesn't think that a roll over is reasonably foreseeable at their site as it has never occurred before. And they might consider that even if a truck or ADT did roll over the consequence would only be a bit of bruising or a shaken up operator.

Immediately it is obvious that the risk rankings on a standard 5x5 risk matrix will be completely different if the assessment is completed using only the immediately available local knowledge and experience.

In this example the Regulator, using all of New Zealand reporting evidence, might assess raw risk of a fatality occurring when a vehicle overturns as:

**Extreme x Almost certain = Very high risk**

A local operator using only their own experience could determine the risk as:

**Minor x Unlikely = Low**

Most operators in New Zealand would understand this risk and the difference in assessment in this example may be exaggerated, but this does illustrate the importance of calculating risk in the most objective way you can. No New Zealand operations are large enough to be able to determine consequence or probability based on their own knowledge or history. Therefore, the operator must actively look to industry wide or even international examples and statistics to determine raw risk. This especially applies to new activities where there is little local knowledge to accurately determine the potential consequences and frequency.

Risk assessments should be completed by a diverse selection of persons and preparation for the assessment should include sourcing as much information about the risks as possible. The information considered should be applicable to large working populations, and representative of extended time periods, and should never be based on just local knowledge.

If initial risk assessments are not completed accurately operators may focus on the wrong issues.

## 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 Q4

Table 5 provides a summary of high potential incidents notified to WorkSafe in Q4 2022/23. The summaries are an abridged version from the operator's notification report.

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Apr 23	No injury. Truck and trailer tipping off material at the managed fill site, the trailer tipped on its side during tipping off material. Suspected material hung up in trailer bin causing the trailer to tip over.	<ul style="list-style-type: none"> <li>- Roads and vehicle operating areas</li> <li>- Tips, ponds and voids</li> <li>- Job planning</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Apr 23	Whilst operating an integrated tool carrier with an electrician in the attached work basket, the operator of the IT has leant forward on the seat to better observe the basket, and in doing so the seat has lifted vertically on the pneumatic seat suspension/adjustment mechanism due to the reduction in weight, and has contacted the corner of a touchscreen located to the right hand side of the dash, pushing the boom height adjustment lever into the screen, and pushing the lever back, resulting in an uncontrolled upward movement of the basket.	<ul style="list-style-type: none"> <li>- Equipment design</li> <li>- Risk assessment</li> </ul>
Apr 23	The injured worker was working on forklift boom, slipped off and fell 800mm. He hit his head and got a laceration on his face. No loss of consciousness. He was taken to hospital for a checkup and diagnosed with a skull fracture.	<ul style="list-style-type: none"> <li>- Fall from height</li> <li>- Job planning</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Apr 23	Blasting contractor was conducting a routine blast in the lower area of the pit. Upon final stock count and reconciliation, it was discovered that one electronic detonator and one 250g booster was unaccounted for.	<ul style="list-style-type: none"> <li>- Explosives</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Apr 23	A 777 dump truck was hauling waste and while descending the ramp the truck has been on a recently watered section of ramp and started to slide, hit the center bund on the road causing the truck to roll over on its side.	<ul style="list-style-type: none"> <li>- Roads and vehicle operating areas</li> <li>- Road design</li> <li>- Job planning</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Apr 23	Loader picking up bucket of grade 3 came in on an angle and the block walls have collapsed and then hit the nearby power pole.	<ul style="list-style-type: none"> <li>- Roads and vehicle operating areas</li> <li>- Plant and structures</li> <li>- Electricity</li> <li>- Risk assessment</li> </ul>
May 23	Operator was running a re-tune on LPG fed drying trommel, and the chute at the trommel entry (at the Trommel flame point) has caught fire. The conveyor belt that feeds the Trommel has then also caught fire.	<ul style="list-style-type: none"> <li>- Fire or Explosion</li> <li>- Maintenance</li> <li>- Job planning</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
May 23	During the process of spraying shotcrete on a section of a tunnel wall, some wet shotcrete fell off the wall and made contact with the injured person's helmet. Following this the injured person has tripped over and injured their ankle.	<ul style="list-style-type: none"> <li>- Ground or strata instability</li> <li>- Exclusion zones</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
May 23	Bulldozer backed into pond. No injuries.	<ul style="list-style-type: none"> <li>- Tips, ponds and voids</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>



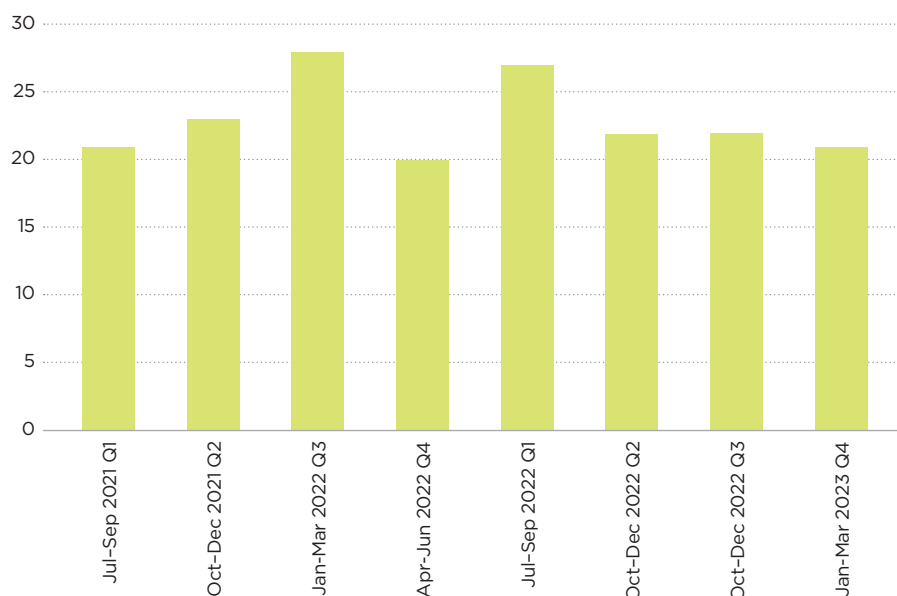
<b>INCIDENT DATE</b>	<b>SUMMARY</b>	<b>CONSIDERATIONS</b>
May 23	Electrical component of a variable speed drive has failed and tripped the protection circuits. On investigation it appears that the component has had some arcing.	<ul style="list-style-type: none"> <li>- Electricity</li> </ul>
May 23	As the day shift crew were heading into the tunnel, the man rider attached to the locomotive derailed at low speed. The jolting of the man car dislodged the sliding door into the man rider. The injured worker was seated in front of the dislodged door and suffered a cut to the forehead.	<ul style="list-style-type: none"> <li>- Roads and vehicle operating areas</li> <li>- Plant design</li> <li>- Risk assessment</li> </ul>
May 23	Shot firers where loading shot beside the shot and noticed a cord from the previous shot and investigated and found a booster and detonator which had not gone off from the previous blast. This blast had not been started to be dug. Shot firer has removed the det and booster.	<ul style="list-style-type: none"> <li>- Explosives</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
May 23	No injury event. A slip at the lower end of a face occurred after heavy downpours on site. This area was not being accessed by pedestrians or light vehicles as the risk was known and this was part of the controls.	<ul style="list-style-type: none"> <li>- Ground or strata instability</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Jun 23	An unsupported cut in a decline unraveled before ground support could be installed and compromised three to four rows of previously installed ground support.	<ul style="list-style-type: none"> <li>- Ground or strata instability</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Jun 23	Dump truck operator parked in alleyway between main plant structures under the walkway bridge, with truck still idling. Operator physically turned in seat to reach for his hardhat and seconds later heard a noise, looked up and realised the deck was lifting and made contact with walkway bridge above. The operator quickly pushed the tray lever back down and reported to supervisor.	<ul style="list-style-type: none"> <li>- Roads and vehicle operating areas</li> <li>- Plant and structures</li> <li>- Risk assessment</li> </ul>
Jun 23	No injury. The event notification is for a plant rollover. An ADT dump truck being operated on one of the quarry haul roads was returning from tipping off brown rock at stockpile (so was empty). The empty vehicle was driven off the side of the quarry haul road and rolled onto its side in a soft shoulder. The operator had his seatbelt on and was able to exit the vehicle after it came to rest and was unhurt, minimal damage to the ADT.	<ul style="list-style-type: none"> <li>- Roads and vehicle operating areas</li> <li>- Road design</li> <li>- Job planning</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Jun 23	Organised workers for chest x-rays as part of their health assessments and two employees received referrals to a lung specialist for further analysis.	<ul style="list-style-type: none"> <li>- Air quality</li> <li>- Worker health</li> </ul>
Jun 23	Two 33t excavators – one sunk into lake and the second has tried to recover it but has got into trouble also.	<ul style="list-style-type: none"> <li>- Ground or strata instability</li> <li>- Tips, ponds and voids</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> <li>- Emergency response</li> </ul>
Jun 23	Injured person sustained significant bruising (no broken leg) from a fall of ground.	<ul style="list-style-type: none"> <li>- Ground or strata instability</li> <li>- Exclusion zones</li> <li>- Workplace inspection</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Jun 23	Contactors were removing build up from beneath a conveyor and felt an electric shock through his wet glove.	<ul style="list-style-type: none"> <li>- Electricity</li> <li>- Maintenance</li> <li>- Job planning</li> <li>- Risk assessment</li> <li>- Supervision</li> <li>- Training</li> </ul>
Jun 23	Operator undertaking roller replacement on conveyor, stepped sideways off the end of the walkway. Fell approx 1.5m onto sand covered concrete base.	<ul style="list-style-type: none"> <li>- Fall from height</li> <li>- Plant and structures</li> <li>- Risk assessment</li> </ul>

**TABLE 5:** High potential incidents - 2022/23 Q4

Table 6 and Figure 12 shows the number of high potential incidents per quarter during the last two years for all extractives operations.

QUARTER	Q1 JUL-SEP 2021	Q2 OCT-DEC 2021	Q3 JAN-MAR 2022	Q4 APR-JUN 2022	Q1 JUL-SEP 2022	Q2 OCT-DEC 2022	Q3 JAN-MAR 2023	Q4 APR-JUN 2023	TOTAL PREVIOUS 12 MONTHS
Number of high potential incidents per quarter	21	23	28	20	27	22	22	21	92

**TABLE 6:** High potential incidents per quarter**FIGURE 12:** Number of high potential incidents per quarter

## 2.7 High potential incidents – investigation outcomes

Jun 23	Contactors was removing build up from beneath a conveyor and felt an electric shock through his wet glove.
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**TABLE 7:**  
Investigation  
outcomes case study

### THE INCIDENT

A contractor was working on a conveyor belt, checking and replacing rollers during a planned maintenance period. When they were clearing the build up of mud from around a roller and framework they felt a small electric shock. The worker was sent to hospital for medical assessment.



**FIGURE 13:**  
Photograph of incident

### The investigation identified

- Redundant electrical conduit had corroded on bend at the point where it went across the framework/supporting structure of the conveyor, exposing the internal wiring.
- The exposed wiring was covered in a large amount of wet dust and rock, and the contractor attempted to remove the wet dust whilst wearing gloves (wet due to the weather) to check roller bearings.
- This area normally has a build-up of dust and rock on the framework and when it rains this then becomes mud-like in consistency allowing corrosion to begin on galvanised conduit.
- The wiring was exposed on to the edge of the framework and due to continuous vibration of the conveyor, the outer insulation has worn through and exposed the internal wire.

### Conclusions and key learnings identified

A failure to remove redundant electrical services combined with a poor standard of installation (lack of adequate support/brackets) allowed the conduit to contact the framework of the conveyor. The vibration of the conveyor framework, combined with the conduit being in a damp and sometimes wet dust over several years assisted in the corrosion of the conduit and exposing the electrical wires inside.

**Regulator comments and recommendations:**

The Electricity (Safety) Regulations 2010:

- state the generic rules and requirements about electrical safety, and what is deemed to be electrically safe and unsafe
- deal with the design, construction and use of works, installations, fittings and appliances
- provide for installations to be designed and installed under *AS/NZS 3007 Electrical equipment in mines and quarries – Surface installations and associated processing plant*
- define certification and documentation required for all electrical works
- set out in schedules all of the applicable standards, with a focus on the adoption of international Standards
- define requirements relating to safety management systems (SMSs)
- provide for offences including infringement offences.

It is important any electricians you use to perform electrical work are familiar with the Electricity (Safety) Regulations 2010 and they certify all work they perform. One particularly important document is *AS/NZS 3007:2013 Electrical equipment in mines and quarries – Surface installations and associated processing plant*.

Mobile and relocatable equipment at alluvial mines and quarries must be assessed yearly against *AS/NZS 3007* by a qualified mining electrical inspector.

Machinery must be properly grounded before use and all connections, switches and cables must conform to the Electricity (Safety) Regulations 2010.

As a general rule:

- a. Use Residual Current Devices (RCD's).
- b. Electrical substations should be kept clean and not used as stores. They should be kept locked with access to authorised workers only.
- c. All equipment should be part of the electrical maintenance and inspection scheme.
- d. Batteries should be treated with caution. Manufacturer's instructions should be followed for maintenance and precautions to be taken (that is, PPE).
- e. Dust accumulations can have a serious effect on the safe functioning of electrical equipment. Make sure housekeeping procedures are in place.
- f. All electrically powered equipment should be capable of being isolated. The isolation points should be clearly labelled and means of isolation provided.
- g. Where the operators have been properly trained it may be appropriate to access some electrical equipment for the purposes of resetting trips. In these cases it may be permissible to open cabinet doors provided the equipment inside is properly shrouded to prevent inadvertent access or arc flash.
- h. Switchboards should be securely locked at all times. Where wiring is damaged it should be reported immediately. Water should not be allowed to accumulate in switch boards or switch rooms.
- i. Underground cables and pipes should be accurately located on a site plan and identified before digging.

**Further information**

[Electricity Safety Regulations 2010](#)



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## 3.0 Regulatory insights

### **IN THIS SECTION:**

**3.1** Who is a competent person?



### 3.1 Who is a competent person?

#### Geotechnical assessments and advice

From 18 July 2023, A Grade Quarries and alluvial mines are required to carry out an appraisal of the operation to identify principal hazards, which may include ground or strata instability. This is already a requirement for mining operations.

Use competent people for technical input and advice during the appraisal process, as required. To determine if ground or strata instability is a principal hazard, consider how an excavation might feasibly fail, and the likely consequences of any such failure.

Following the identification of ground or strata instability as a principal hazard, the operator must ensure a geotechnical assessment is completed by a competent person. A risk assessment must be completed for the ground or strata instability principal hazard, as well as a principal hazard management plan (PHMP). The ground or strata instability PHMP must contain information detailed in regulations 68 and 71.

From 18 July 2023, B Grade quarries and alluvial mines with high risk working faces must obtain geotechnical advice from a competent person about any high-risk working face at the operation and take that advice into account when developing, documenting, implementing, and maintaining the health and safety management system for the operation.

#### What is a high-risk working face?

High-risk working faces are defined in Regulation 118B.

A high-risk working face means a working face that:

- a. is at least 15m high, or
- b. poses a significant risk to workers as a result of one or more of the following factors:
  - i. the height of the working face
  - ii. the ground type at the base of the working face
  - iii. the angle of the working face's slope
  - iv. the strength of the rock on the working face
  - v. the composition of the rock on the working face
  - vi. the geological structure of the working face
  - vii. the bedding surfaces of the working face
  - viii. the presence of water on or around the working face, or
- c. is part of an excavation that, at its deepest, is more than 30m below the surrounding ground level.

Smaller and non-complex quarries and alluvial mines will not have high risk working faces present, but these operations will also need to have controls in place to manage the ground hazards present at the operation.

#### Definition of a competent person

A competent person is defined in the Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations in Regulation 3.

Competent person means a person who:

- a. has the relevant knowledge, experience, and skill to carry out a task required or permitted by the MOQO Regulations to be carried out by a competent person, and
- b. has a relevant qualification evidencing the person's possession of that knowledge, experience, and skill or – if the person is an employee – a certificate issued by the person's employer evidencing that the person has that knowledge, experience, and skill.

#### Competent person for geotechnical assessments and advice

The level of detail required for geotechnical assessment/advice geotechnical advice should always be site specific and will depend on the nature, scale and complexity of the operation.

Typically, the assessment/advice should be provided by a technical specialist such as a geologist, engineering geologist or geotechnical engineer who has experience in carrying out slope stability assessments and providing advice on control measures for ground stability for Extractives operations (or similar environments).

There may be isolated cases where it could be appropriate for geotechnical advice to be provided by a competent person such as a Manager who has worked at a site for many years, and where there is extensive and documented empirical evidence of control of ground stability hazards at a specific site. However, the definition of a high-risk working face itself will exclude most non-complex operations and in most of the cases external expertise will be required.



**Priscilla Page**  
Acting Deputy Chief Inspector Extractives



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# 4.0

## The regulator

### IN THIS SECTION:

- 4.1 Our activities
- 4.2 Assessments
- 4.3 Enforcements

## 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.

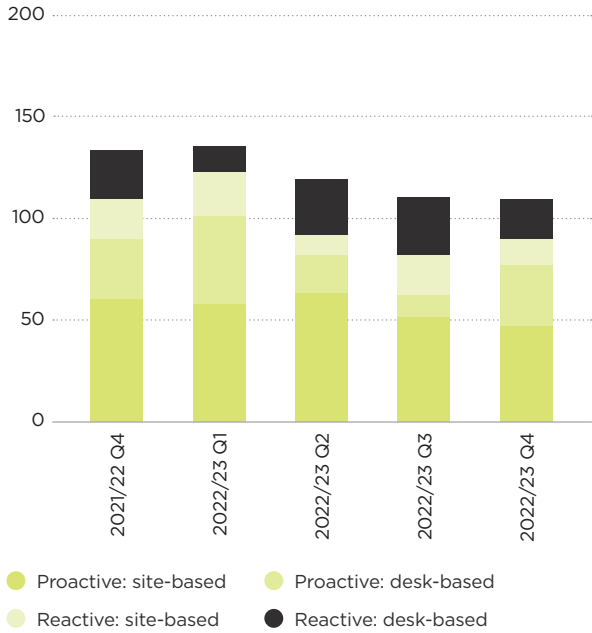
Table 8 shows the range of assessments undertaken in Q4 2022/23 by sector.

		ASSESSMENTS	MINE	TUNNEL	ALLUVIAL MINE	QUARRY
Preventative	Site-based	Targeted assessments				
		Regulatory compliance assessments				
		Site inspections	10	4	1	30
		Targeted inspections	2			
	Desk-based	PHMP/PCP review		17		
		Mine plan review	7	5		
		High risk activity	1			
Reactive	Site-based	Concerns - inspection				4
		Notifiable events - inspection		2	1	6
	Desk-based	Concerns - desk-based				2
		Notifiable event - desk-based	8	2	2	5

**TABLE 8:** Proactive and reactive site and desk based assessments conducted in Q4 2022/23

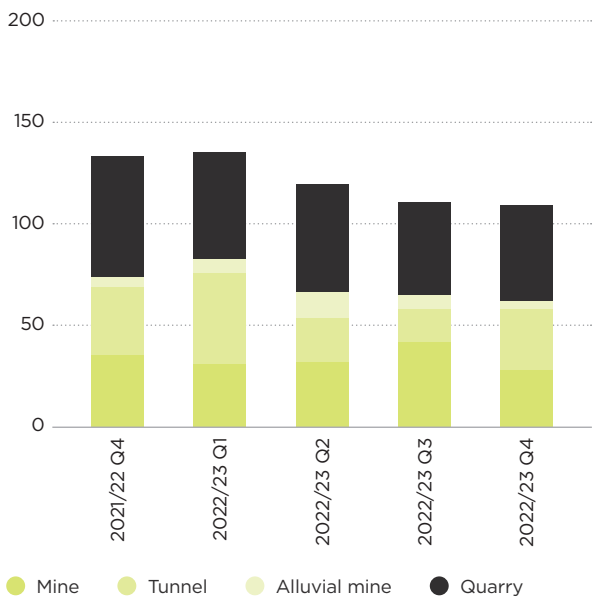


Figure 14 shows the number of proactive and reactive site- and desk-based assessments undertaken by the regulator in Q4 2022/23. This quarter 55% of our activities were site-based, and 71% of activities were proactive. Twenty-eight percent of proactive site inspections were unannounced.



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

Figure 15 shows the number of assessments undertaken by the regulator in Q4 2022/23 by sector. This quarter, 43% of our assessments were for quarries, 26% for mines, 28% for tunnels and 4% for alluvial mines.

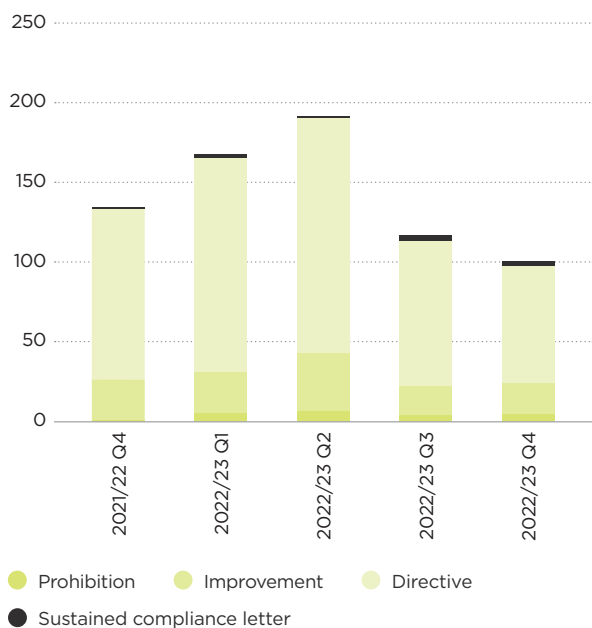


**FIGURE 15:**  
Assessments by sector

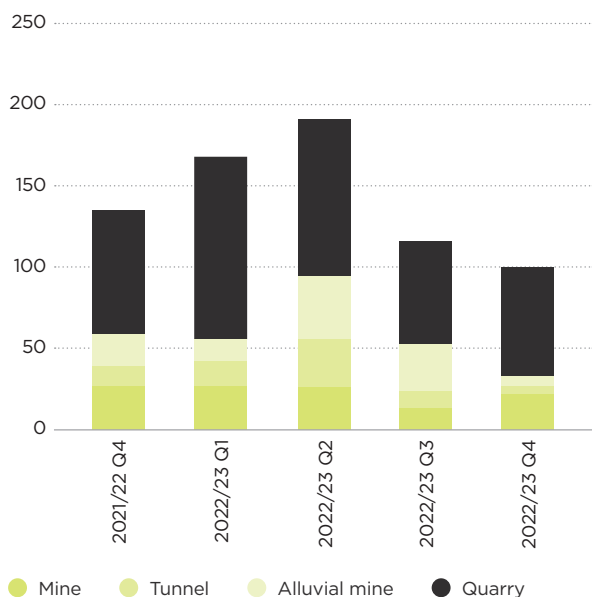
### 4.3 Enforcements

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 Q4 2022/23 by notice type and by sector. This quarter, a total of 100 enforcement actions were issued. Of those, 5% of were prohibition notices, 19% were improvement notices, 74% were directives and 2% were sustained compliance letters. The majority of the enforcement actions were issued to the mining (22%) and quarrying (67%) sectors.



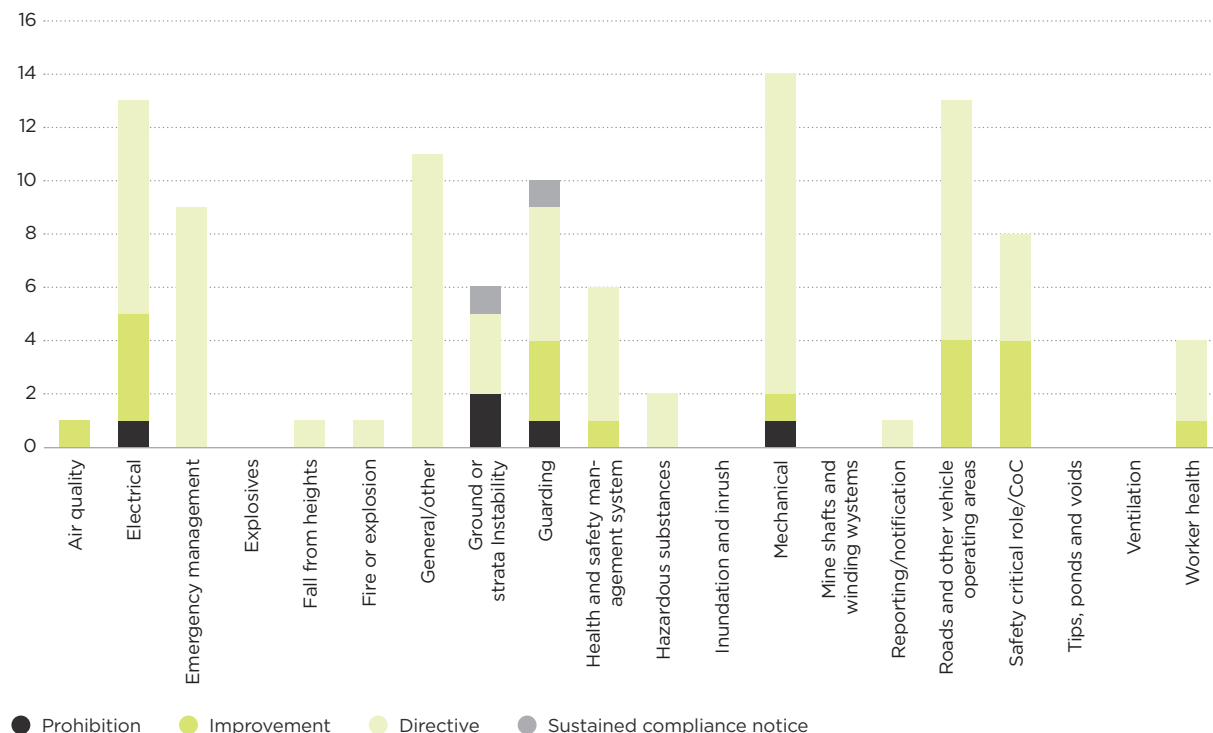
**FIGURE 16:**  
Enforcement actions issued by type



**FIGURE 17:**  
Enforcement actions issued by sector



Figure 18 shows the number of enforcement actions issued in Q4 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 (13%), mechanical (14%) and electrical (13%).



**FIGURE 18:** Enforcement actions issued by category 2022/23 Q4

### Regulator activity comment

The actual inspections completed for the reporting year were 227 planned proactive inspections and 71 reactive inspections for a total of 298 site inspections (Reactive inspections are when we visit a site due to a notifiable event or complaint).

This number of inspections was consistent with the annual plan: 228 planned proactive inspections, plus a target to follow up 60% percent of HPIs on site. There were 92 HPIs during the year, equating to a target of 54 HPIs attended. Therefore, we planned to inspect sites approximately 282 times.

This delivery of planned inspection numbers was achieved while Inspectors also delivered a greater number of educational engagements than in previous years. The engagement included the WorkSafe health and safety workshops that targeted smaller operators and managers to provide assistance with meeting the new regulatory requirements.

Enforcement was slightly down in the final quarter of the year, but total number of notices for the year was consistent with previous years as were the areas where enforcement was used.

This year was unusual in that new regulatory requirements were introduced (most significant in the Quarry and alluvial mining sectors). In general, Worksafe used an engage and educate approach to this introduction. With some of the regulations now being bedded in, the approach to non-compliance will shift more to enforcement.

### **Disclaimer**

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