QUARTERLY REPORT

Extractives industry

2022/23 Q3

January to March

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.

May and June is the time that we reflect on how the year has gone (FY July 22 to June 23). We consider the performance of our own team and in our case, we consider what industry has achieved and their performance regarding health and safety. And then, like many of you, we take all of this into account and put our plans together for the next year.

The current year started with a significant change for all of us occurring, with part one of the regulation changes coming into effect on 18 July 2022.

I think it is fair that we give ourselves and the industry a pass mark for this implementation. WorkSafe mining and quarrying inspectors have tried their best to get around the country to assist operators to understand the new requirements and how to develop the health and safety systems to comply. Many operators have participated in workshops and hopefully have benefited from the sessions. The feedback from those that have attended has been overwhelmingly positive.

And industry seems to have responded to the new regulations well enough at this stage. A good proportion of operators have been very willing to engage and learn. Once they have understood the new requirements, especially around basic documentation requirements and the requirements for inspection, notifications etc they have made reasonable efforts to comply.

To some extent we have focused on those willing participants to the industry-wide workshops, as just by attending, they have demonstrated they deserve our time and attention. We see good improvements in health and safety systems quickly with the more motivated operators.

Some requirements of the new regulations have not been met that well and will need to be improved. The percentage of operators who complete the quarterly reporting is still low. This is a mandatory requirement, and it is expected every operator will comply. Once operators realise what is required and have used the online reporting portal, most report that the filing of the quarterly report information is relatively easy.

This data is very important for us to get an accurate picture of our industry and should be a real focus for all.

What we have decided after reflection on the last year is that we will continue to prioritise the education workshops in our planned activities. We think that the workshops we have run this year have given us better engagement with industry, while providing an opportunity to improve industry knowledge. This improved knowledge of operators and managers should ultimately result in better outcomes on sites.

And as we understand that attending one workshop will not teach every operator enough, we want to ensure that by holding these workshops across New Zealand that there is an opportunity for every manager or operator to attend one next year as well. And likely the years that follow.

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

8

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

1

Coal exploration
One operational coal exploration project

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)

955

Quarries
Number of quarries that have been verified (828) or have notified of an Appointed Manager to WorkSafe but not yet verified (127)

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 1,065 active operations in New Zealand as at the end of March 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

612

Metalliferous opencast mines
470 FTEs employed by mine operators and 149 FTEs employed by contractors

698

Coal opencast mines
561 FTEs employed by mine operators and 136 FTEs employed by contractors

268

Metalliferous underground mines
219 FTEs employed by mine operators and 49 FTEs employed by contractors

0

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

289

Tunnels
248 FTEs employed by mine operators and 41 FTEs employed by contractors

<1

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

420

Alluvial mines
Number of workers is known for 40 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 27 operations

3,063

Quarries
Number of workers is known for 718 of the 955 quarries that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 237 operations

There were 5,358 Extractives FTEs in New Zealand as at the end of March 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 first quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe. Quarterly reports were provided by 12 alluvial mining operations (18%) and 227 quarries (24%). 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 Q3 2022/23, reported to WorkSafe in the quarterly reporting. The hours are separated into Employees and Contractors.

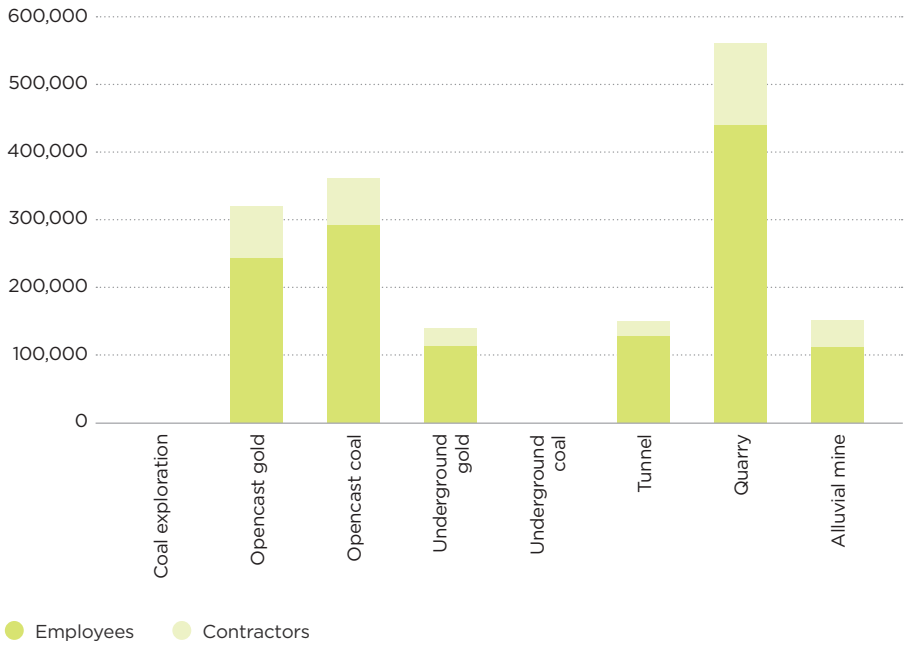

FIGURE 1:
Total hours worked by sector 2022/23 Q3

Figure 2 shows the number of Full Time Equivalents (FTEs) calculated from total hours worked that were reported to WorkSafe in quarterly reports for Q3 2022/23. The hours are separated into Employees and Contractors.

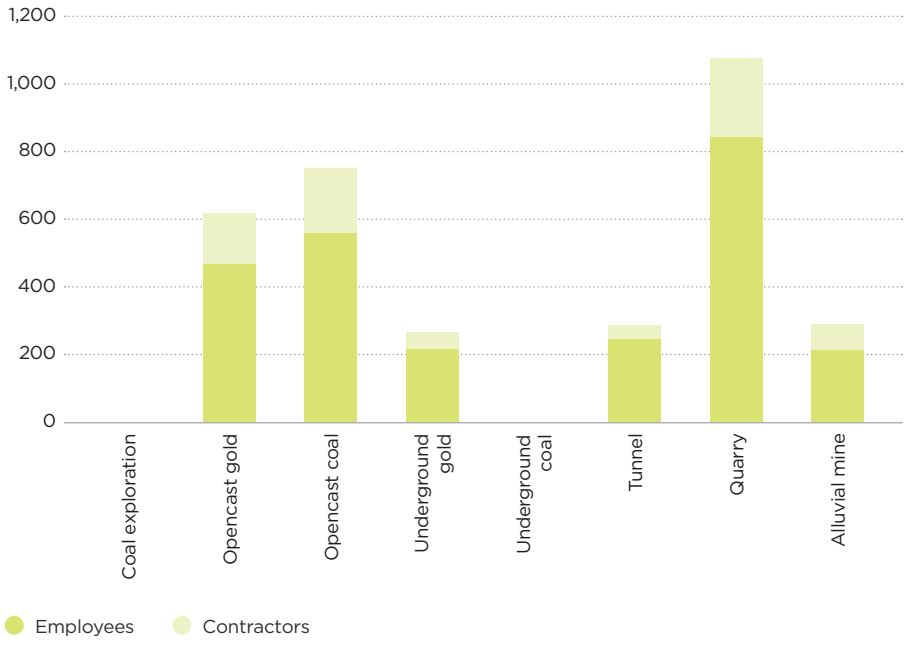

FIGURE 2:
Number of FTEs by sector 2022/23 Q3

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).

Last quarter, an explanation of what a Safe Work Instrument is, was given in this section.

Following consultation, and advice from the New Zealand Board of Examiners (BoE), WorkSafe will finalise what competencies will be required to sit a Certificate of Competence (CoC). These will be stated by way of a Safe Work Instrument (SWI) instead of the current gazette notices. This SWI is scheduled to take effect by 18 July 2023.

The consultation process received many comments about what was proposed. There was quite a range of feedback on various topics received. In general, there was general acceptance of what was being proposed. Some minor changes will be made. At the time of writing this, none of the changes to be made are significant enough to require any further consultation.

What has been difficult for WorkSafe (and the BoE) is that several changes that are agreed to be appropriate could not be included in the draft that was circulated for consultation. An example is where unit standards were agreed to be replaced – but the replacement unit standard was not yet available. The SWI cannot prescribe the new unit standard until it is available to applicants, or nobody could achieve the requirements to be eligible to sit an oral examination for that CoC.

An example

There was a change made to the regulations to put into effect a submission received which was to create a Ventilation Officer (VO) CoC that did not require coal knowledge. The BoE and WorkSafe were required to create that CoC – and intend to replace the underground coal ventilation unit standards with non-coal versions. These are not immediately available – but will be soon. The draft SWI that was consulted on did not prescribe the non-coal unit standards in the base VO CoC. (To be a VO at a coal mine you are still required to complete the coal ventilation units as before). The BoE will, for a period of time, modify their examination process to assess the applicant's ventilation knowledge to ensure that the VO does have and understand the knowledge that would be in the non-coal ventilation standards. When the unit standard becomes available it will be formally added to the non-coal VO CoC requirements.

These types of arrangements should all be thought of as transitional arrangements to ensure that applicants for CoCs are not disadvantaged or delayed by the availability of unit standards or trainers to deliver them.

It is intended that all new unit standards and those that may be changed will be available in about 12 months from the date of this first SWI coming into effect. And it is anticipated that 'version two' SWI (an updated version including these new and changed unit standards) will be circulated to industry for consultation and then to be implemented.

It is understood that this may be confusing to some applicants, but WorkSafe will release comprehensive supporting information and explanatory notes to support the SWI. This explanation will include details of the new unit standards that will be proposed in version two. This information will be released with the SWI.

Currently the SWI is being reviewed by WorkSafe legal and will need to be signed off by the Minister. The plan is still to have this in place by 18 July 2023.

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

TOTAL NUMBER OF ORAL EXAMS HELD Q3 JAN–MAR 23	TOTAL PASSES	SUCCESS
23	16	69.6%

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 Q3 2022/23.
Note: We no longer report Life Time CoCs.

COC TYPE	TOTAL COCs RENEWED Q3 Jan–Mar 2023	TOTAL NEW COCs ISSUED Q3 Jan–Mar 2023	TOTAL NUMBER OF CURRENT COCs
A Grade Quarry Manager	1	2	246
B Grade Quarry Manager	3	10	348
A Grade Opencast Coal Mine Manager	4	0	53
B Grade Opencast Coal Mine Manager	1	1	49
A Grade Tunnel Manager	0	0	36
B Grade Tunnel Manager	1	3	74
Site Senior Executive	1	0	49
First Class Coal Mine Manager	0	0	16
First Class Mine Manager	1	0	16
Coal Mine Deputy	0	0	28
Coal Mine Underviewer	0	0	18
Mechanical Superintendent	1	0	22
Electrical Superintendent	0	0	17
Ventilation Officer	0	0	4
Mine Surveyor	0	0	13
Site Specific	0	0	3
Winding Engine Driver	0	0	0
Total	**13**	**16**	**992**

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, Q2 and Q3 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
Number of notifiable events	20	18	20	24	21	21
Number of operations that notified events	11	9	11	7	9	12

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

Sixteen individual mines and tunnels from a total of 42 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
Number of notifiable events	18	16	14	19	14	15
Number of operations that notified events	15	12	13	18	13	15

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

Forty individual quarries and alluvial mines from a total of 1,022 reported notifiable events in the past 12 months.

Figure 3 shows the number of notifiable events reported to WorkSafe by sector from April 2021 to March 2023.

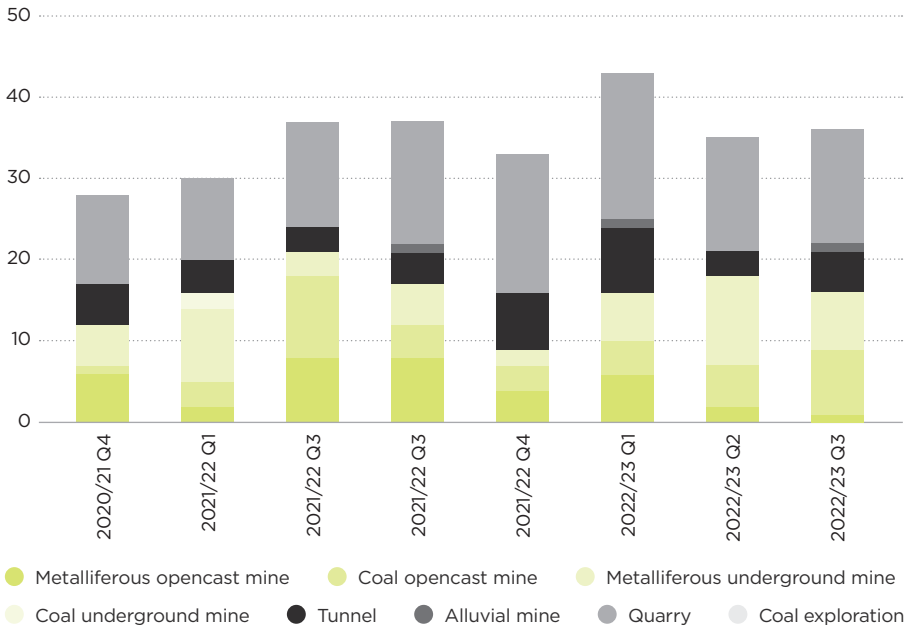

FIGURE 3: Notifiable events by sector

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 second 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 April 2020 to March 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 4.3. 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.

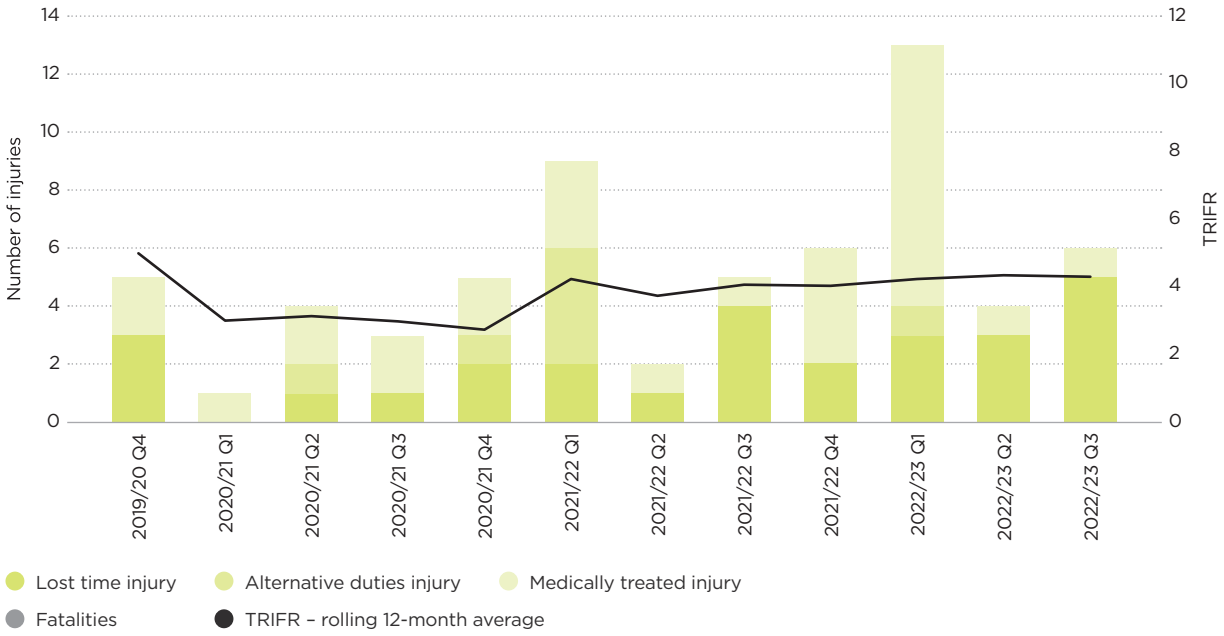

FIGURE 4: TRIFR – mines and tunnels

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 July 2020 to December 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 July 2020 to December 2022 was over $21,800 per injury.

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

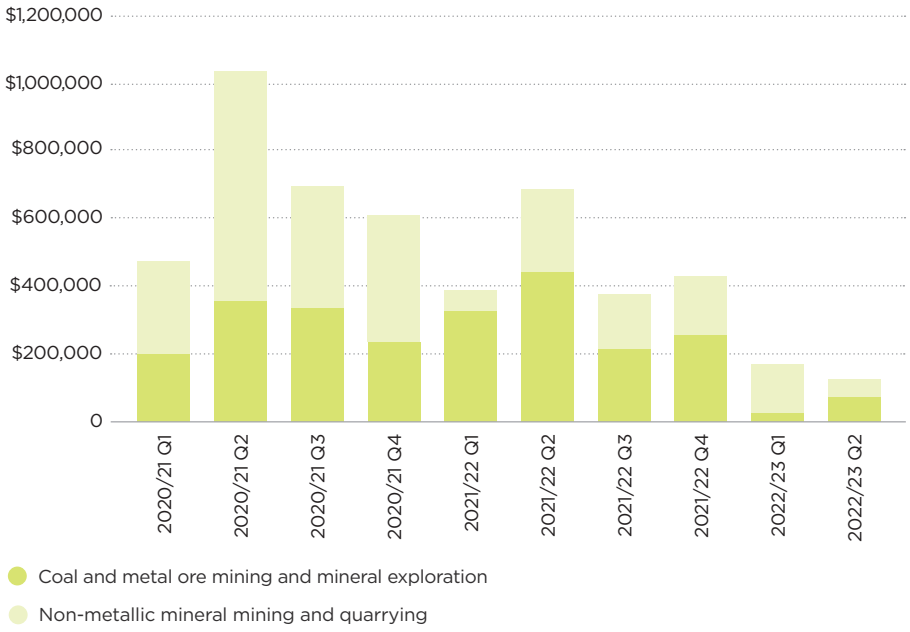

FIGURE 6:
Sum of claims cost (excluding GST) for injuries resulting in more than a week away from work

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 38 percent of notifiable events in the past 12 months have occurred in relation to vehicles and plant (24%), and fire, ignition, explosion or smoke (14%). 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.

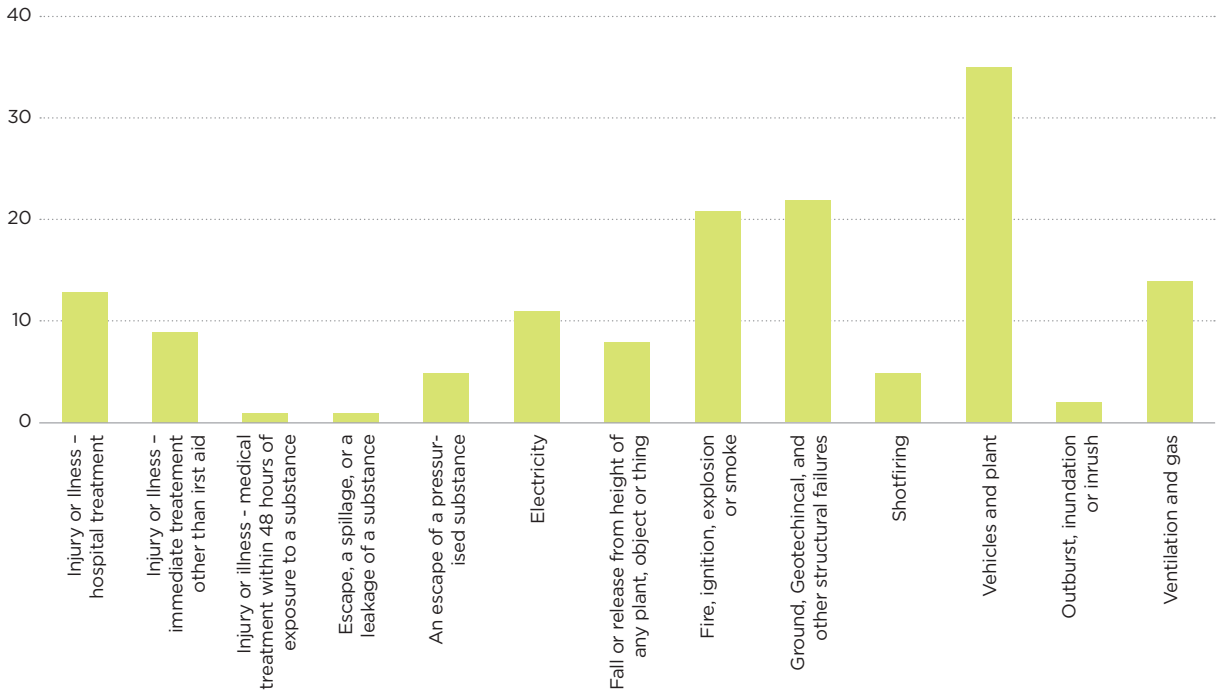

FIGURE 7: Notifiable event categories for the previous 12 months

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, 57% involve fires on plant, mobile plant or in buildings associated with mining or tunnelling activities, 5% involves spontaneous combustion, and 38% 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 (23%), overturning of mobile plant (47%), breach of a safety berm or windrow (6%), and unintended movement or brake failure (24%).

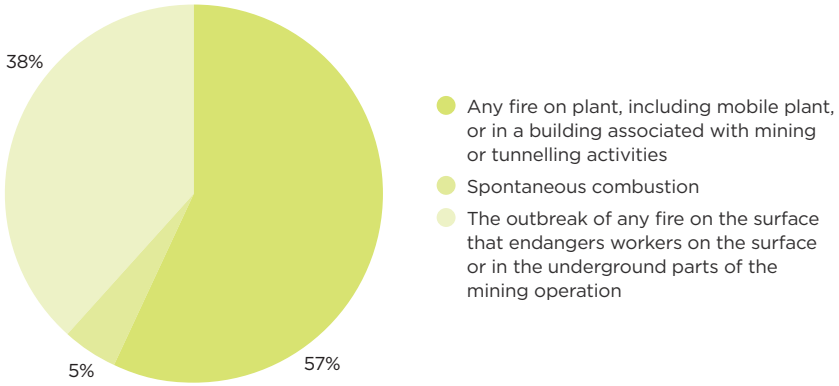

FIGURE 8:
Fire, ignition, explosion or smoke-related notifiable event sub-categories

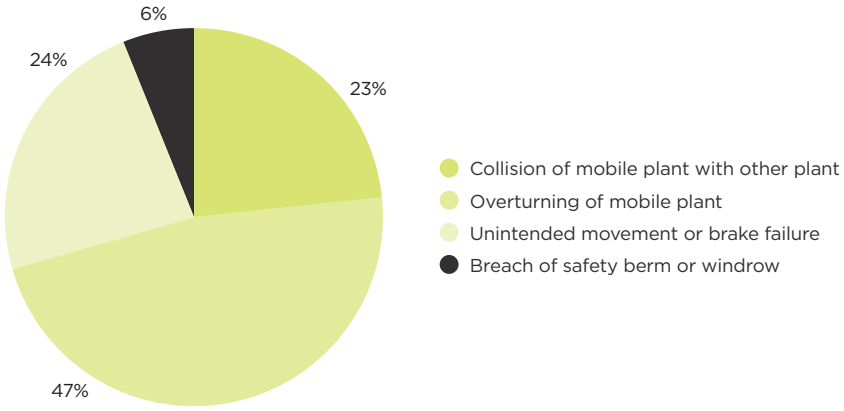

FIGURE 9:
Vehicles and plant-related notifiable event sub-categories

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 38% 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 4.0% 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 second quarter that quarrying operations and alluvial mining operations were required to submit quarterly reports to WorkSafe. Quarterly reports were provided by 12 active alluvial mining operations (18%) and 227 active quarries (24%). Last quarter 11 active alluvial mining operations and 274 active quarries submitted quarterly reports.

Additionally, the number of quarterly reported received from quarrying operations that reported zero hours worked was 92 (last quarter this number was 115).

The total number of quarrying operations that submitted a quarterly report this quarter was 319 (last quarter this number was 414).

2.5 Regulator comments

The types of incidents that are being reported are all totally foreseeable, and the majority of these incidents are repeats of similar outcomes in similar circumstances – the incidents are sometimes reported by the same operators, and on occasion are from the same sites.

What is concerning is that repeated incidents often results in a ‘normalisation’ of these events in managers’ and workers’ minds, which is in effect acceptance of some types of incidents at the site. That often the incidents did not have a particularly bad outcome for workers, further contributes to a general feeling that these incidents are ‘just the way it is’ and that the odd roll over or collision of vehicles for example, is really quite predictable and not that noteworthy.

Of course, this is not what the series of incidents is really saying, which is that there is a significant failing in the systems and work practices on the site and that every time there is an incident and the systems have failed it is really a warning that there is a much higher risk to workers’ safety than there should be on the site.

It is the regulator’s opinion that every notifiable incident (any near miss) should trigger considerable concern. Multiple incidents of a similar nature are an even more significant alert that should cause an escalation of response. If an incident reoccurs after having been investigated and controls put in place once, this is evidence that the controls are inadequate, and there must be further controls added or existing controls improved. Full consideration to the circumstances of the incident and a full assessment of the work being undertaken should be completed. The controls should be robustly considered against the hierarchy of controls. Rather than introduction of a new administrative control. Could replacement of types of equipment or/and redesign and construction of roads go closer to eliminating the risks?

The regulator has noted in recent investigations that some repeat incidents are being investigated and the conclusions and recommended actions are the same as the previous similar incident.

We have seen one of two things occurring:

1. the controls identified and implemented were inadequate, or
2. the controls have not been implemented correctly or at all – both are unacceptable.

WorkSafe always require evidence of implementation of actions. After repeat incidents we will also look to previous actions that we have been advised are in place in 30-day investigation reports for the earlier events. We would expect the operator to ensure that these previous actions are also considered in all new investigation reports.

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 Q3

Table 5 provides a summary of high potential incidents notified to WorkSafe in Q3 2022/23. The summaries are an abridged version from the operator's notification report.

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Jan 23	Crane block dislodged and fell to the ground.	– Fall from height – Mine shafts and lifting systems – Job planning – Risk assessment – Supervision – Training
Jan 23	Truck and trailer dumping fill at temporary dump site, moved into place to offload from trailer, fill was very sticky and would not come out. Driver dropped trailer one level to try to dislodge, trailer (only) tipped over on to side.	– Roads and vehicle operating areas – Tips, ponds and voids – Job planning – Risk assessment – Supervision – Training
Jan 23	Dump truck was reversing up to dump on stockpile, Operator was too close to the off side windrow. The right rear duel position six tyre has beached the windrow. No Injury.	– Tips, ponds and voids – Job planning – Risk assessment – Supervision – Training
Jan 23	Worker was working at a lime crushing plant. Put fingers into radiator fan. Cut on left hand little finger, small bone chip off the knuckle. Ring finger broken in two places and cut the tendon on the top. Admitted into the hospital, operation on Monday due no staff on the weekend. Did a site analysis of what happened. Put guard on it to reduce the risk, safe to continue working.	– Guarding – Job planning – Risk assessment – Supervision – Training

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Jan 23	While cleaning a face, a slip occurred in the face and trapped the operator in the cab. The operator used his emergency hammer to exit through the emergency window.	– Ground or strata instability – Workplace inspection – Risk assessment – Supervision – Training
Jan 23	Loader clearing stockpile underneath stacker belt when front left tyre deflated instantaneously. Causing no damage or injury.	– Pressurised substances – Maintenance – Job planning – Risk assessment – Supervision – Training
Feb 23	No injury. Truck driver misjudged distance between grader and edge of road and outside wheels of both machines contacted. Grader was grading the middle of the road in opposite direction to truck.	– Roads and vehicle operating areas – Road design – Risk assessment – Supervision – Training
Feb 23	Dump truck rolled over on its side during dumping at the waste dump area. The operator did not sustain any injuries, and none around was injured.	– Roads and vehicle operating areas – Tips, ponds and voids – Risk assessment – Supervision – Training
Feb 23	A customer was picking up some metal in his truck which can carry up to 10t. When he was driving away no faster than 20km. He was turning to pull over to the side of this flat road to check his truck when the truck tipped on its side. The customer suffered a pulled hamstring and a grazed lower leg. No workers were involved.	– Roads and vehicle operating areas – Risk assessment – Supervision – Training
Feb 23	There was a fall of ground out of the wall of an active stockpile bay. There were no injuries or equipment damaged sustained as result of incident. The area was barricaded, and full inspection of the mine took place to ensure similar conditions did not exist elsewhere.	– Ground or strata instability – Workplace inspection – Risk assessment – Supervision – Training
Feb 23	Operator has sneezed and his eyes were running as he went wipe his eyes, he has knocked his glasses off his head. As he reached for them, he veered off the side of the road into the water table and became stuck.	– Roads and vehicle operating areas – Risk assessment – Supervision – Training
Mar 23	No injury. Segment car on locomotive had rear wheels derail, causing minor damage to rail, sleepers and a handrail, and in contacting a compressed airline, caused compressed air to be released from the pipe.	– Roads and vehicle operating areas – Pressurised substances – Workplace inspection – Risk assessment – Supervision – Training
Mar 23	A truck was parked where they fill their bins up. There sounds like there was no air in the tanks locking the brakes on. The driver exited the truck to have a look at the bins. He did not put the park brake on when getting out and as the air built up it released the brakes sending the truck free wheeling down the ramp into our block wall bunding. The truck was stopped by the bunding from going down the face.	– Roads and vehicle operating areas – Mechanical – Workplace inspection – Risk assessment – Supervision – Training
Mar 23	An excavator working on the main access realignment came too close to the power line and bought it down. The operator was unaware that he had made contact with the line.	– Electricity – Job planning – Workplace inspection – Risk assessment – Supervision – Training

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Mar 23	LV rollover.	– Roads and vehicle operating areas – Risk assessment – Supervision – Training
Mar 23	Unplanned fall of ground. Fired an excavation to form a cuddy for be used for pumping equipment. The backs of the decline were heavily supported before the firing with shotcrete and cable bolts because the conditions were considered poor. The backs of the unsupported ground failed to a depth of approximately 5m above the original back height. The rock continued to fail at the brow of the failure compromising previously installed ground support. The decline was to put on hold and the area barricaded.	– Ground or strata instability – Workplace inspection – Risk assessment – Supervision – Training
Mar 23	A segment was lifted by crane from a segment stack. The dogman went to remove a length of timber dunnage that separates the segments in the stack. In the process of removing the timber dunnage, the weight from the lifted segment has come back on the dunnage and trapped the worker's finger.	– Fall from height – Lifting – Manual handling – Job planning – Risk assessment – Supervision – Training
Mar 23	Moxy tipping off at clay tiphead and left hand side of moxy rear axles started to go to left and moxy bin tipped over.	– Roads and vehicle operating areas – Tips, ponds and voids – Risk assessment – Supervision – Training
Mar 23	The operator of haul truck backed up to the dozer on a dump and stopped short and on dozer horn as per JSEA. Operator then started to tip his load and felt the right hand side of the truck start to move. He's put the truck into gear to move forward as the dozer operator signalled to move forward with two blasts on the horn. The whole truck then slowly subsided backwards. Looking in the mirror the whole dump face had slumped.	– Tips, ponds and voids – Ground or strata instability – Roads and other vehicle operating areas – Workplace inspection – Risk assessment – Supervision – Training
Mar 23	Slump of batter face. A pocket of exposed material dislodged and fell from the top of the face cut. The slump occurred as the excavator slewed anti-clockwise with a loaded bucket, the material being placed in the dump truck which was nearly fully loaded. Whilst the quantity of material that slumped was not huge, due to the excavator having a loaded bucket, slewing and more than halfway passed the 180° turn, the momentum of both tipped the excavator over and off the bench it was sitting on. The excavator fell approximately 2.5m from the bench it was sitting on to the ground and landed on the operators left cab side. As the excavator landed, the top part of the cab hit the bin of the dump truck. The weight of the excavator combined with the bin of the dumptruck that was nearly fully loaded, resulted in a roll-over of the cab of the dumptruck, the complete opposite of what would generally occur with an articulated dump truck. The bin of the dump truck had the weight of the load, plus had the weight of the cab of the excavator, and the impact of the excavator made the cab lift, and due to the articulated nature the cab twisted and landed on the cab (operators left side). The dump truck operator was not wearing a seatbelt, and this resulted in him being tossed around inside the cab as it lifted and twisted to the left. As the cab came down, momentum took the operator downwards and he ended up pressed again the left cab door window (which was halfway down) as the cab came to a stop. The excavator operator was wearing a seatbelt. The excavator also has ROPS. The operator was able to exit the excavator. The dump truck operator smashed the half open window of the dump truck, and he fell about 1m from the interior of the cab to the ground below.	– Ground or strata instability – Roads and other vehicle operating areas – Workplace inspection – Risk assessment – Supervision – Training

INCIDENT DATE	SUMMARY	CONSIDERATIONS
Mar 23	A dump truck slid on haul road. A dump truck was traveling back to the excavator from the dumping location. The water truck was on the circuit and had recently watered the road. The dump truck went over the section of the newly watered road, applied the retarder and slid on the haul road ending up facing the opposite direction. The dump truck did not contact anything. No injury to operator or damage to equipment.	– Roads and vehicle operating areas – Risk assessment – Supervision – Training

TABLE 5: High potential incidents – 2022/23 Q3

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

QUARTER	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	Q3 JAN-MAR 2023	TOTAL PREVIOUS 12 MONTHS
Number of high potential incidents per quarter	16	21	23	28	20	27	22	22	**91**

TABLE 6: High potential incidents per quarter

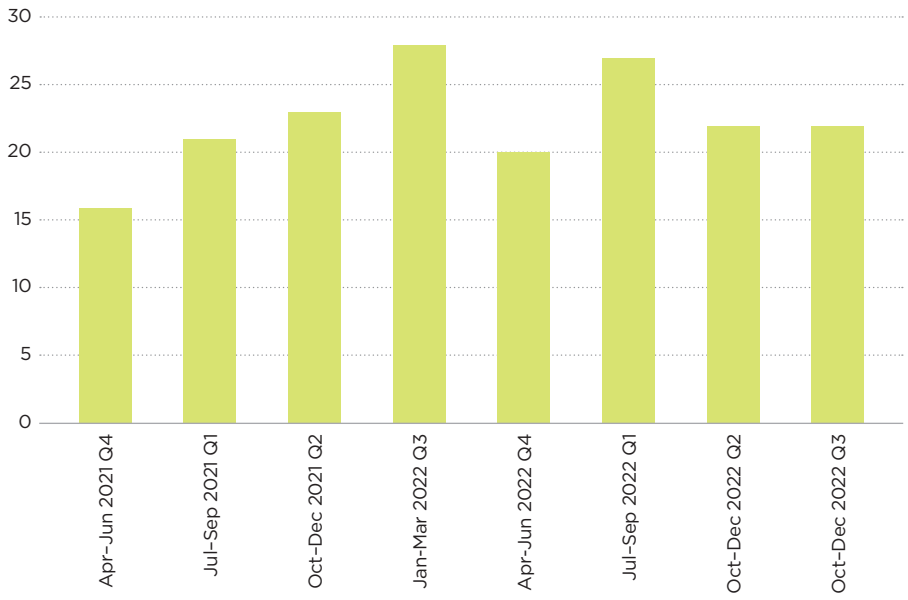

FIGURE 10:
Number of high potential incidents per quarter

2.7 High potential incidents – investigation outcomes

High potential incident case study – ground instability

Jan 23	While cleaning a face, a slip occurred in the face and trapped the operator in the cab. The operator used his emergency hammer to exit through the emergency window.

THE INCIDENT

An excavator was sitting on a muck pile loading dump trucks at the face, when the bench behind the shot slipped, resulting in rock hitting the excavator. The face had been excavated clean and while loading the last couple of trucks, the face slipped on a greasyback or natural weathered fault.

The operator was clearing the face when he saw movement in the left corner of his eye. He reacted by trying to move, but the rock slip that occurred was too fast and ended up around the cab, some spilling into the cab, covering his seat belt. He used an emergency hammer to cut the seatbelt and break the back exit window to get out of the cab.

FIGURE 11:
Photograph of incident

The investigation identified

The cause of the incident was attributed to:

- undetected geological fault
- water run off over faces can result in geotechnical fault areas to become unstable
- cab was facing the wall rather than away from it
- the higher the faces the more material is at play when a slip occurs.

Key learnings identified

During the investigation it was found that although the faults were clearly visible on drone footage, they were not visible when doing inspections on the same level and therefore the faults were not detected. Further contributing factors were the fact that there were heavy rainfall events in the months leading up to the incident, which resulted in water washing into the faults making it more unstable. The fact that the face was slightly higher than 15m contributed to the amount of material slipping.

Regulator comments and recommendations

Planning for excavations requires a good understanding of ground conditions, and determining ways in which potential ground failure could be avoided. A systematic approach to managing ground instability is very important.

Before any excavation begins, an appraisal of the site ground conditions should be undertaken by a competent person to determine all factors likely to affect the stability of the ground and the limitations that should be imposed on the excavation site design.

Following appraisal of ground conditions, a design should be prepared setting out the measures to control ground instability.

Excavation rules should be drawn up, including:

- the manner in which excavation activities should be carried out, specifying the type and reach of excavators
- the physical dimensions of the excavation including slope, height of faces, width of benches, position of catch-berms and gradient, position and protection of access ramps
- the way in which material should be removed from the excavation
- the sequence in which material should be removed
- maintenance of faces including scaling
- the nature and frequency of supervision
- the nature and frequency of inspection and monitoring
- response to geological structures or defects.

These rules are essential for the proper management of excavations. They are practical measures required to keep excavations and the people working in and around them safe.

Faces that have potential for instability should be worked within the reach height of the equipment used, whether they are working in sand or hard rock. If mobile plant is at risk of being engulfed in a face collapse, a trench or rock trap should be used to maintain a safe operating distance.

Revised regulations

From 18 July 2023, A Grade Quarries and alluvial mines will be 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.

Further information

Health and Safety at Work (Mining Operations and Quarrying Operations) Amendment Regulations 2022

Health and safety at opencast mines, alluvial mines and quarries

3.0 Regulatory insights

IN THIS SECTION:

3.1 Your mobile plant operator is competent, right?

The problem

The data is indisputable, mobile plant incidents are the most frequent high potential incidents (HPI) reported to WorkSafe and feature in the most fatal accidents in New Zealand workplaces (excluding health related worker deaths). The number of incidents has remained static for many years. The extractive sector needs to address this issue to reverse this trend. Doing the same thing won't achieve a reduction. An area that is an obvious way to influence a change is the competency of the mobile plant operator.

Many of you reading this will think that you have a robust system to verify the competency of your mobile plant operators. WorkSafe challenge you to rethink this position. The extractive industry has no agreed industry wide mobile plant verification of competency (VoC) standard. Any VoC system currently in place at your site was probably implemented using the collective knowledge of your workforce.

WorkSafe see a range of VoC systems ranging from basic questions and cursory observations lasting a few minutes, through to in-depth observational assessments incorporating a range of tasks and probation periods. Some companies include productivity as a component of competency.

Mobile plant refers to machines such as excavators, dump trucks, loaders and bulldozers that are used for various purposes in the extractive industry. Mobile plant operators need to have a high level of competency to operate these machines safely and efficiently, as they pose significant risks to themselves and other workers. The mobile plant operators should be competent enough to identify and deal with changes as they occur, for example, adverse weather, heavier than normal traffic, new operators unfamiliar with site rules, deteriorating road surfaces. Often competency will be demonstrated by a mobile plant operator stopping work after identifying the hazard and suggesting remedial actions.

Need for improvement

Operator competency can be defined as the ability to perform a task or activity safely and effectively, according to the standards and expectations of the employer. Because of the lack of industry standards about what is an ideal competency assessment, the development of VOC standards is ad-hoc. There is an opportunity to reverse the number of mobile plant deaths. Leaders in the extractive sector could collectively agree on a VoC standard and how best to apply it. How the industry would develop and agree on a VoC standard is uncharted waters. WorkSafe could facilitate the discussion as could MINEX. Whatever the mechanism is used to bring about this change, by doing nothing, the industry is accepting the status quo. WorkSafe is aware of some companies that have seen a reduction in mobile plant incidents, and it is no surprise that they have heavily invested in operator and assessor competency and technology.

Operator competency depends on various factors, such as:

- **Knowledge**: The operator must have adequate knowledge of the machine's functions, features, limitations, controls, maintenance and safety requirements. The operator must also have knowledge of the site conditions, hazards, and emergency procedures.
- **Skills**: The operator must have practical skills to operate the machine smoothly, accurately, and efficiently. The operator must be able to perform various tasks and be able to use attachments such as quick hitches safely and correctly.
- **Experience**: The operator must have sufficient experience to operate the machine in different situations and environments. The operator must be able to adapt to changing conditions, such as weather, terrain, traffic and workload. The operator must also be able to cope with unexpected events, such as malfunctions, breakdowns or emergencies.
- **Attitude**: The operator must have a positive attitude towards safety and quality. The operator should consistently follow rules and instructions. Effective communication with other workers and supervisors is vital. The operator must be responsible, alert and attentive at all times.

Operator competency can be achieved through various means, such as:

- **Training**: The training must cover both theoretical and practical aspects of operating the machine. The training should also be relevant to the specific type of machine.
- **Qualification**: The civil construction sector has developed qualifications relating to mobile plant and certain aspects of competency in that sector, are transferable to the extractive sector however, there is an opportunity for the Extractive sector to set their own competency standards and tailor them to the nuances of mining.
- **Assessment**: The operator should undergo regular assessment from a competent assessor. The assessment must evaluate the operator's knowledge, skills, experience and attitude. The assessment must also be based on objective criteria and evidence.

The critical component

The role of the VoC assessor is crucial in determining whether the operator is competent or not. The assessor is a person who has the authority and expertise to assess the operator's competency. In the absence of a robust assessment standard the outcomes will be variable.

In order for assessors to be impartial, consistent and fair, having a VoC standard developed by the industry for the industry is a critical component for improving operator competency.

In conclusion, operator competency plays a prominent role in preventing mobile plant accidents and ensuring safe and productive work outcomes. Operator competency can be achieved through training, qualification and assessment. The role of the assessor is vital in determining whether the operator is competent or not. Having a consistently applied VOC standard in the extractive sector also provides assurance to managers when workers move to another employer.

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 Q3 2022/23 by sector.

		ASSESSMENTS	MINE	TUNNEL	ALLUVIAL MINE	QUARRY
Preventative	Site-based	Targeted assessments				
		Regulatory compliance assessments				
		Site inspections	14	4	6	27
		Targeted inspections				
	Desk-based	PHMP/PCP review		3		
		Mine plan review	2	6		
		High risk activity				
Reactive	Site-based	Concerns – inspection	1	1	1	2
		Notifiable events – inspection	4			11
	Desk-based	Concerns – desk-based				
		Notifiable event – desk-based	21	2		5

TABLE 8: Proactive and reactive site and desk based assessments conducted in Q3 2022/23

Figure 12 shows the number of proactive and reactive site- and desk-based assessments undertaken by the regulator in Q3 2022/23. This quarter 65% of our activities were site-based, and 56% of activities were proactive. Seven percent of proactive site inspections were unannounced.

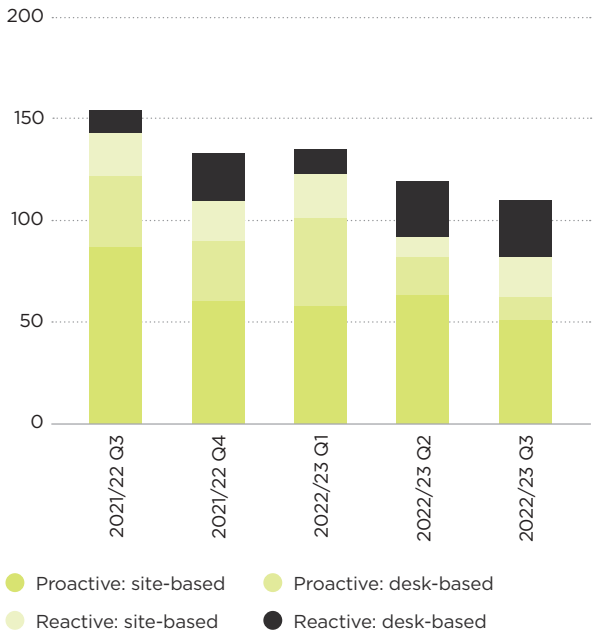

FIGURE 12:
Proactive and reactive site and desk-based assessments

Figure 13 shows the number of assessments undertaken by the regulator in Q3 2022/23 by sector. This quarter, 41% of our assessments were for quarries, 38% for mines, 15% for tunnels and 6% for alluvial mines.

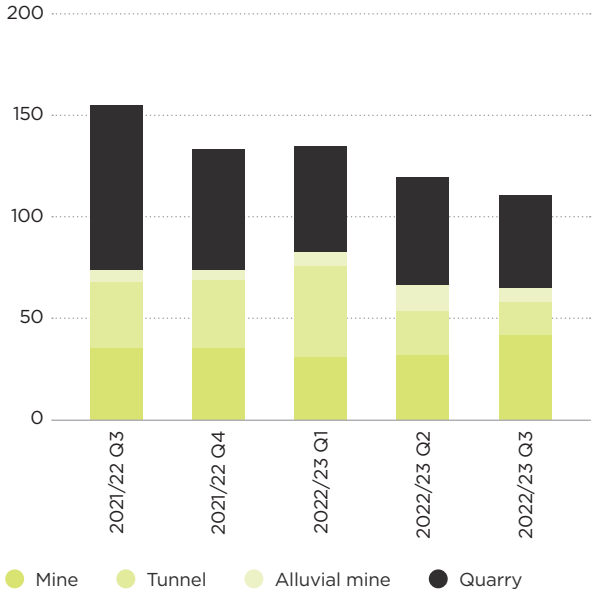

FIGURE 13:
Assessements by sector

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 14 and 15 show the number of enforcement actions issued in Q3 2022/23 by notice type and by sector. This quarter, a total of 117 enforcement actions were issued. Of those, 3% of were prohibition notices, 16% were improvement notices, 78% were directives and 3% were sustained compliance letters. The majority of the enforcement actions were issued to the alluvial mining (25%) and quarrying (55%) sectors.

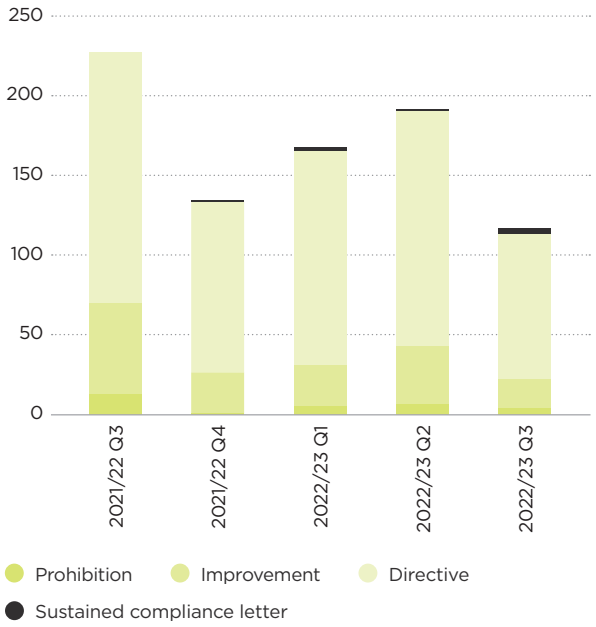

FIGURE 14: Enforcement actions issued by type

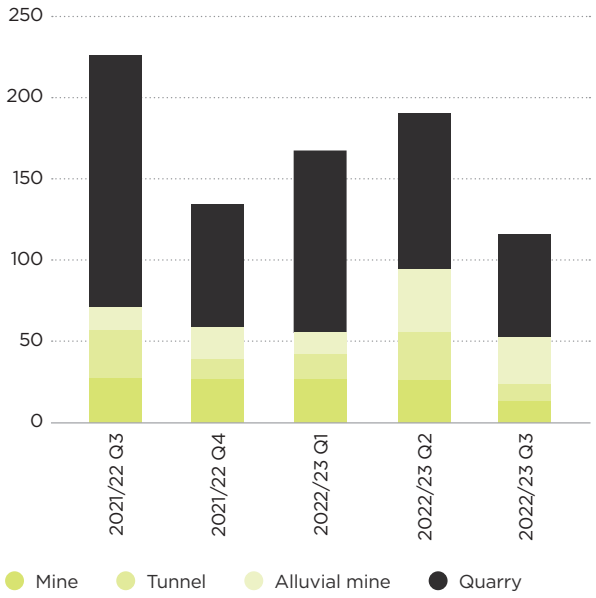

FIGURE 15: Enforcement actions issued by sector

Figure 16 shows the number of enforcement actions issued in Q3 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 (17%), guarding (14%) and Health and Safety Management System (11%).

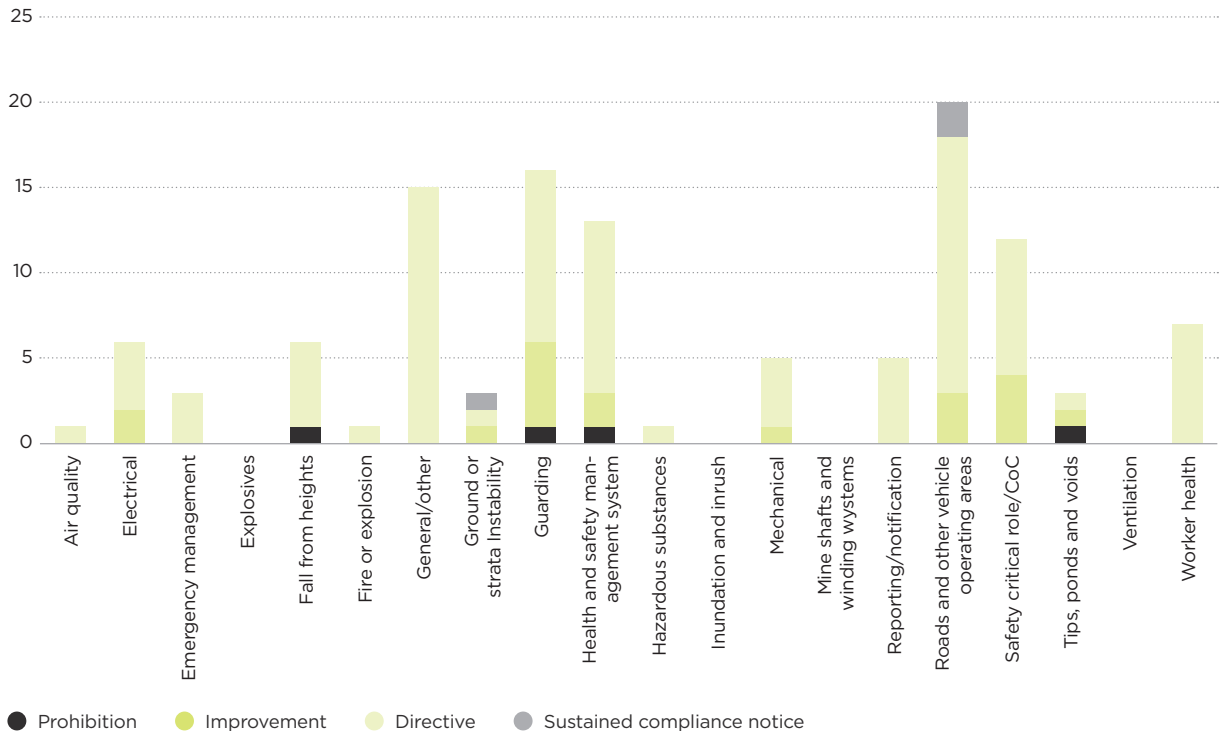

FIGURE 16: Enforcement actions issued by category 2022/23 Q3

Regulator activity comment

The extractives team continued to meet the annual inspection plan numbers, while also facilitating Health and Safety Workshops to support small operators with implementation of the revised mining and quarry regulations. The workshops are considered to be a primary engagement/education activity of the regulator. Enforcement type, numbers and categories remain similar to previous quarters. The reduction in tunnel activity is largely due to the abandonment of a large Auckland tunnelling operation. (Abandonment from being a construction tunnel – it is still a civil construction site, but abandoned under the definition in the Act and is longer under the mining regulations). The focus on roads and other vehicle operating area related risk management will continue to be a priority.

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ISSN 2703-3392 (online)

Published: June 2023

PO Box 165, Wellington 6140, New Zealand

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WSNZ_4606_JUN 23

ISSN 2703-3392 (online)

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