

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, but of businesses, workers and a wide range of other players in the health and safety system.

About this report

This quarterly health and safety performance report has been prepared by WorkSafe New Zealand to provide specific extractives sector information. The information is derived from a variety of sources but the predominant source is industry itself through the mining and tunneling sector quarterly reporting and notifiable incident reporting. This information is critical in helping us determine where we should be focusing our regulatory approach.

The report should be a useful tool for industry operators and owners to assist them to better understand the makeup of the industry they work within and to understand current and trending health and safety issues.

This quarterly report provides a multitude of performance measures that are derived from a much larger and better representative data set than would be available to individual operators. The measures are useful for benchmarking against all of industry performance. This report also lists the safety events of note in the quarter. These are serious incidents that have actual or potential serious outcomes. The report will provide early learnings from these incidents, where possible.

Accurate reporting of these events is critical to industry as it identifies and heightens awareness of the types of low frequency but high consequence events that are occurring in New Zealand. This awareness often comes too late to prevent tragic outcomes.

The information you receive in this report will assist you to better undertake your day to day work and meet your obligations under the Health and Safety at Work Act 2015 (the Act).

WorkSafe believes that a common understanding of the health and safety performance of the sector will allow us all to work smarter, target risk and work together to improve.

We thank all of the operators who have provided information to WorkSafe in the form of quarterly reports and notifications, and hope the information provided in these reports is valuable to your future planning.



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 care and maintenance, and one undertaking rehabilitation **21**

Coal opencast mines Includes three mines under care and maintenance, and one undertaking rehabilitation 6

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

2

Coal underground mines Includes one tourist mine under care and maintenance 3

Tunnels

Does not include tunnels that notified commencement but did not begin operating in the quarter 0

Coal exploration

No notifications of drilling commencement in the quarter

71

Alluvial mines

Number of mines that have been verified (66) or have notified of an Appointed Manager to WorkSafe (5) (includes 2 iron sands mines)

1,163

Quarries

Number of quarries that have been verified (938) or have notified of an Appointed Manager to WorkSafe (225)

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 1,269 active operations in New Zealand as at the end of December 2019.

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.

The numbers of operations will vary from quarter to quarter. In these first quarterly reports, many of the changes are due to verification of sites by our Inspectors, rather than actual changes to operations. Changes to note this quarter are:

- there are currently no active coal explorations in New Zealand (down by 3 from last quarter)
- the number of active quarries decreased by 46 as a result of verifications by our inspectors that those quarries were no longer operating
- the number of active alluvial mines decreased by 12 also as a result of verifications.

1.2 People

470

Metalliferous opencast mines

370 FTEs employed by mine operators and 100 FTEs employed by contractors

883

Coal opencast mines

721 FTEs employed by mine operators and 162 FTEs employed by contractors

569

Metalliferous underground mines

418 FTEs employed by mine operators and 151 FTEs employed by contractors

20

Coal underground mines

17 FTEs employed by mine operators and 3 FTEs employed by contractors

75

Tunnels

43 FTEs employed by mine operators and 32 FTEs employed by contractors

0

Coal exploration

No coal exploration in the quarter

285

Alluvial mines

Number of workers is known for 28 of the 71 alluvial mines that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 43 operations 3,281

Quarries

Number of workers is known for 639 of the 1163 quarries that are verified and/or have notified of an Appointed Manager. The total number of workers has been extrapolated for the remaining 524 operations

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.

A notable change is anticipated in the number of tunnel workers with two large tunnel operations in Auckland going operational between January and June 2020. Thousands of different types of workers will be exposed to these operations over the duration of the projects.

Figure 1 shows the total hours worked by the mining and tunnelling sectors in Q2 2019/20. The hours are separated into Employees and Contractors.

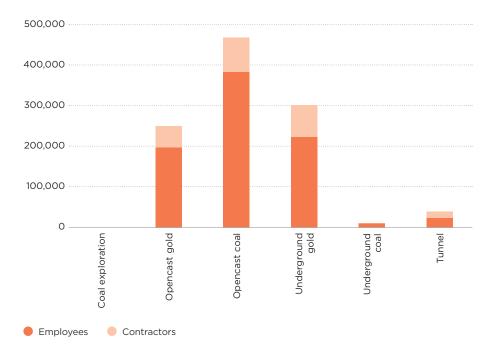


FIGURE 1: Total hours worked by sector 2019/20 Q2

Figure 2 shows the number of Full Time Equivalents (FTEs) calculated from total hours worked for the mining and tunnelling sectors in Q2 2019/20. The hours are separated into Employees and Contractors.

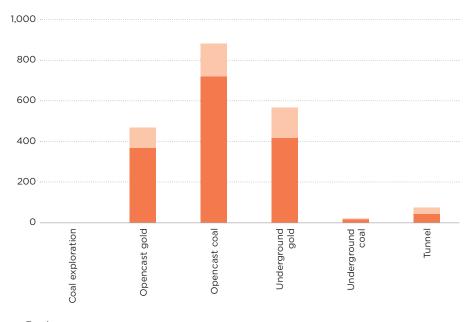


FIGURE 2: Number of FTEs by sector 2019/20 Q2

Employees

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).

Table 1 provides a summary of the total number of CoCs issued by COC type since 2015, and the number of new COCs issued in Q2 2019/20.

COC TYPE	TOTAL NUMBER OF COCs ISSUED 2015 to December 2019	NUMBER OF COCs ISSUED Q2 October to December 2019	
A Grade Quarry Manager	319	2	
B Grade Quarry Manager	451	12	
Lifetime Quarry CoCs (Estimated)	300		
A Grade Opencast Coal Mine Manager	71		
B Grade Opencast Coal Mine Manager	64	1	
A Grade Tunnel Manager	31		
B Grade Tunnel Manager	67	3	
Site Senior Executive	61	1	
First Class Coal Mine Manager	17		
First Class Mine Manager	23		
Coal Mine Deputy	41		
Coal Mine Underviewer	33		
Mechanical Superintendent	24	1	
Electrical Superintendent	17		
Ventilation Officer	3		
Mine Surveyor	10		
Site Specific	0		
Winding Engine Driver	3		
Total	1,535	20	

TABLE 1: Certificates of Competence issued

Health and safety performance

IN THIS SECTION:

- 2.1 Notifiable events
- 2.2 Injuries
- **2.3** Types of events
- 2.4 Mine and tunnel focus areas
- 2.5 Commentary
- 2.6 Safety events of note



2.1 Notifiable events

Notifiable events are required to be reported to WorkSafe under S23(1), S24(1) and S25(1) of the Act, and for mining and tunnelling operations, 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 from July 2018 to December 2019 for mine and tunnels (Table 2) and quarries and alluvial mines (Table 3).

MINES AND TUNNELS	2018/19 Q1	2018/19 Q2	2018/19 Q3	2018/19 Q4	2019/20 Q1	2019/20 Q2
Number of notifiable events	18	16	26	13	20	21
Number of operations that notified events	10	9	10	7	10	13

TABLE 2: Mines and tunnels – notifiable events and operations that notified events

Nineteen individual mines and tunnels from a total of 35 reported notifiable events in the past 12 months.

QUARRIES AND ALLUVIAL MINES	2018/19 Q1	2018/19 Q2	2018/19 Q3	2018/19 Q4	2019/20 Q1	2019/20 Q2
Number of notifiable events	13	11	23	9	22	16
Number of operations that notified events	12	10	21	9	20	16

TABLE 3: Quarries and alluvial mines - notifiable events and operations that notified events

Fifty-six individual quarries and alluvial mines from a total of 1,234 reported notifiable events in the past 12 months.

Figure 3 shows the number of notifiable events reported to WorkSafe by sector from July 2018 to Decdember 2019.



2.2 Injuries

Additional information about injuries is reported to WorkSafe for mining and tunnelling operations in the form of Quarterly Reports and Records of Notifiable Events under Schedules 6 and 8 of the Regulations. Figure 4 shows the number of injuries by injury type reported to WorkSafe by the mining and tunnelling sectors from July 2017 to December 2019. 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.

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.

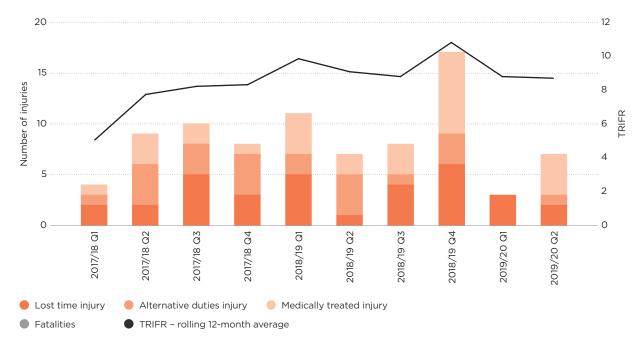


FIGURE 4: TRIFR - mines and tunnels

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 2017 to June 2019. Figures for Coal and Metal Ore Mining have been updated in this report to remove injuries related to Petroleum and Geothermal Support Services.

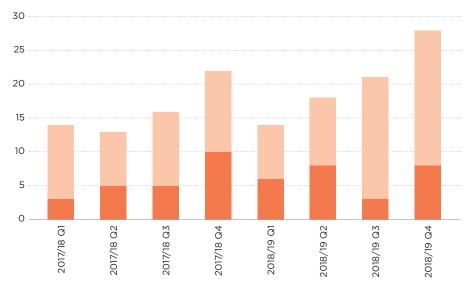


FIGURE 5: Number of injuries resulting in more than a week away from work

- Coal and metal ore mining and mineral exploration
- Non-metallic mineral mining and quarrying

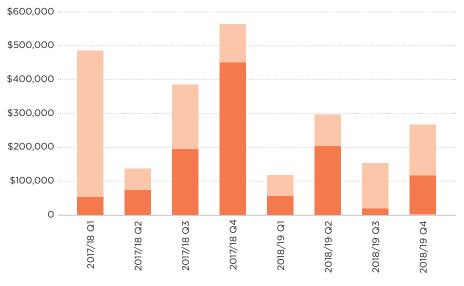


FIGURE 6: Sum of claims cost (excluding GST) for injuries resulting in more than a week away from work

- Coal and metal ore mining and mineral exploration
- Non-metallic mineral mining and quarrying

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 seven month lag applied to the data to allow time for the claim information to stabilise, so data for the past two quarters 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

Figures 7 and 8 show the notifiable event categories for events notified to WorkSafe in the previous 12 months, by the mining and tunnelling sectors and the quarrying and alluvial mining sectors, respectively. The data shows that 53 percent of notifiable events in the mining and tunnelling sectors in the past 12 months have occurred in relation to fire, ignition, explosion or smoke (22%) and vehicles and plant (31%). These two categories are broken down in more detail in the following section. Fifty-three percent of notifiable events in the quarrying and alluvial mining sectors in the past 12 months involved the collapse, overturning, failure or malfunction of, or damage to plant.

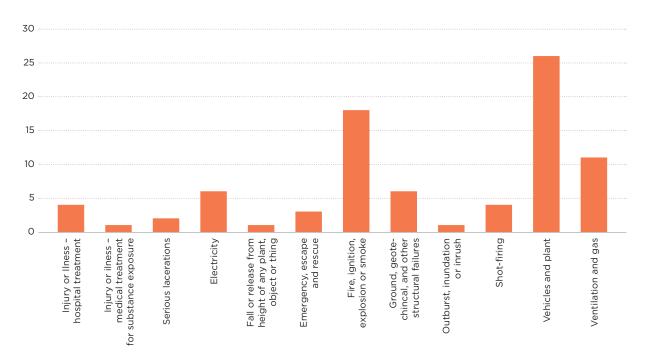
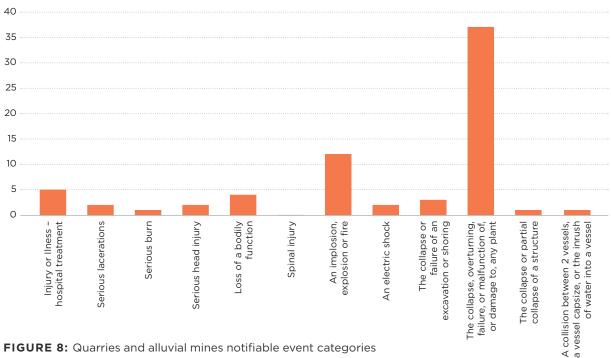


FIGURE 7: Mines and tunnels notifiable event categories for the previous 12 month



for the previous 12 months

2.4 Mine and tunnel 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 for mines and tunnels into the corresponding Schedule 5 sub-categories. The data shows that for notifiable events related to fire, ignition, explosion or smoke, 76% involve fires on plant, mobile plant or in buildings associated with mining or tunnelling activities. The vehicle and plant-related notifiable events involve overturning of mobile plant (46%), unintended movement or brake failure (27%), collision of mobile plant with other plant (11%), or tyre bursts (11%).

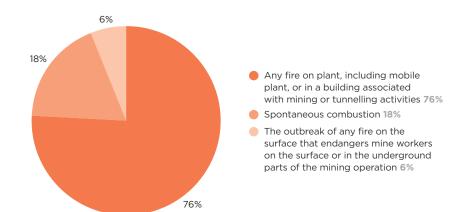


FIGURE 9:

Fire, ignition, explosion or smokerelated notifiable event sub-categories

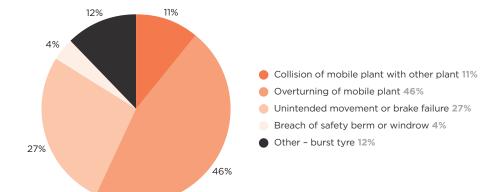


FIGURE 10:

Vehicles and plantrelated notifiable event sub-categories

2.5 Commentary

Consistency of reporting

As in the previous quarter, the data received from mining and tunnelling operations shows that notifiable event reports are being received from a high proportion of the operations, with operators reporting under Schedule 5 of the Regulations. The mining and tunnelling reporting is considered to be accurate and shows a series of high potential incidents and consistent reporting of medical or worse injuries. Larger operations report more frequently but 54% of the existing mines and tunnels have reported over the past 12 months.

The quarry and alluvial mine reporting of notifiable events is from a much lower proportion of the sector and is likely to be less accurate. The quarry sector, which has nearly twice as many workers as the mining and tunnelling sector, notified almost 25% fewer events this quarter, with only 5% of operations reporting notifiable events in the past 12 months. When compared to SWIFT data on WAFW injuries, there is a higher proportion of injuries per notifiable event for quarries than for mines and tunnels. This could suggest under reporting of events in the quarry sector. Note that SWIFT data is not available for 6-7 months after quarterly reporting data is received by WorkSafe, so correlation of the injuries reported with SWIFT data will be a secondary analysis for this report. In general, more accurate reporting for the quarry sector is expected when the requirements for reporting under Schedules 5 and 8 are implemented for quarries.

The mining and tunnelling quarterly reporting is considered the most reliable data set, with a very high percentage of returns for the past two years. This data shows a current TRIFR of 8.5 which tells us that the frequency of injuries that require medical attention is high and also seems to have steadily increased for the past two years.

Regulator comments

The performance measures do not show any significant decrease in the frequency of serious incidents or a reduction in the frequency of injuries. The categories where the most incidents are occurring remain the same. They are related to the operation of mobile plant and the maintenance of machinery. Once again, there were several serious incidents involving working at heights and coming into contact with electrical systems.

The frequency of ADT roll overs and interaction of machinery (both heavy-heavy and heavy-light vehicle) is of serious concern and this will remain a focus for the regulator.

Worryingly a significant proportion of the serious incidents reported could well have resulted in one or more fatalities or serious harm to workers.

Operators should put considerable focus on ensuring that all of the hazards associated with the operation of mobile plant on all sites have adequate controls in place, and are maintained at all times. Operators should also ensure that workers operating mobile plant are adequately trained and also understand these controls. Any incidents involving mobile plant should also be adequately investigated and learnings acted upon.

Operators should ensure that before any worker undertakes any activity such as working at heights or work completed on an infrequent basis, that robust risk assessments are completed and any controls identified are implemented. The identification of all hazards prior to commencing any work is essential to the safety of workers.

2.6 Safety events of note

Table 4 provides a summary of serious notifiable events notified to WorkSafe in Q2 2019/20. The summaries are an abridged version from the operator's notification report.

Incident date	Summary	Considerations
Oct 2019	D10 bull dozer collides with 785 dump truck on dump. No injuries.	Roads and operating surfaces Traffic management plan Training
Oct 2019	Smoke from engine bay on underground vehicle: - triggers emergency due to O-ring failure releasing oil onto hot engine - AFFF activated, significant fire averted.	- Machinery maintenance - Emergency Response plan
Oct 2019	Transport truck and trailer - trailer tipped while tipping. No injuries.	- Training - Roads and operating surfaces
Oct 2019	ADT operating on steep slope rolls. No injuries.	Roads and operating SystemsMachine selectionTraining
Oct 2019	Dump truck hits delineation bund.	Roads and operating surfacesTraffic management planTraining
Oct 2019	Welder using LPG/oxygen combination – while visor was lifted backflash/fire occurred causing burns to face. Leaking couplers were found.	- Equipment maintenance - Pre start - Training
Oct 2019	LV and loader interaction on ROM. Failure of positive communication. Damage to vehicle. No injuries.	Roads and operating surfacesTraffic management planTraining
Oct 2019	Worker fell approximately 1.3m while working on ladder at processing plant. Fractured leg.	- Working at heights - Work risk assessment
Oct 2019	Row of 8 holes in blast fail to initiate.	- Explosives
Nov 2019	Visible flames on underground vehicle. AFFF extinguished the flames. Ignition of crystalline glycol coolant on hot engine parts.	Machinery maintenance Emergency response plan
Nov 2019	Coal haul truck spins 360 degrees on road. Truck lost traction on decline road and crossed centre line but no other vehicles in vicinity.	Roads and operating surfacesTraffic management planTraining
Nov 2019	Sudden rupture of tyre on bogger. Operator had just parked and exited the machine and was in close proximity.	Machinery maintenance Roads and operating surfaces
Nov 2019	Gantry crane unplanned drop of load due to object getting tangled in the hook block. Load dropped 600mm.	Machinery maintenanceWork risk assessment
Nov 2019	Parked truck rolls into another parked truck.	Machinery maintenanceTraffic management planIsolationTraining
Dec 2019	Significant pit wall fails, dropping head scarp by 15m. Early detection of the failure – pit area was evacuated of workers and machinery prior to failure.	- Strata - Emergency response
Dec 2019	While working in a scissor lift a worker was entangled in a skip tag line and pulled across an open shaft area and into the opposite shaft wall. The depth of shaft in which the worker could have fallen was more than 10.	Working at HeightsWork risk assessment

Incident date	Summary	Considerations
Dec 2019	Road truck and trailer used on mine site rolls trailer on pad.	Roads and operating surfacesTraffic management planTraining
Dec 2019	Drill mast contacts 400v power lines.	- Work risk assessment
Dec 2019	Tipulator trailer tips over while discharging product. Truck remained upright.	Roads and operating surfacesTraffic management planTraining
Dec 2019	Collapse of bench following rain event.	- Strata
Dec 2019	Surge pile was over filled causing roof of shed to collapse. Also overflow covered 11KVA power cable which was located in cable tray close to roof.	Process managementWork risk assessmentTraining
Dec 2019	Worker suffered lacerations to hand when directing the tensioning of a crusher unit using chains. Hand was caught between chain ring and exterior of crusher.	- Work risk assessment - Training
Dec 2019	Part of old booster plug and detonator wires uncovered while clearing quarry face. Plug appeared to be about 10-years old. Commenced implementing misfire procedure.	- Explosives
Dec 2019	Komatsu HD465 drives off wash down bay with tray raised and tray strikes overhead conveyor causing the conveyor to fall onto cab. Emergency initiated and electrical isolation required to rescue operator.	 Roads and operating surfaces Traffic management plan Emergency response plan Work risk assessment Training
Dec 2019	ADT tray tipped over while paddock dumping. Reversed onto previous load causing tipping.	Roads and operating surfacesTraffic management planTraining
Dec 2019	Excavator clearing tree causes power lines to fall into work area.	- Work risk assessment - Training
Dec 2019	Loader collides with dump truck causing damage to cab and hand rails of truck.	Roads and operating surfacesTraffic management planTraining
Dec 2019	ADT rolled tray while unloading metal.	Roads and operating surfacesTraffic management planTraining

TABLE 4: Safety events of note - 2019/20 Q2



The regulator

IN THIS SECTION:

- **3.1** Our activities
- **3.2** Assessments
- **3.3** Enforcements

3.1 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.

3.2 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- or desk-based assessment, or both.

Table 5 shows the range of assessments undertaken in Q2 2019/20 by sector.

		ASSESSMENTS	MINE	TUNNEL	ALLUVIAL MINE	QUARRY
Preventative	Site-based	Targeted assessments	1			
		Regulatory compliance assessments				
		Site inspections	11	3	4	50
		Targeted inspections	4			
	Desk-based	PHMP/PCP review		34		
		Mine plan review	2	1		
		High risk activity	6			
Reactive	Site-based	Concerns - inspection				
		Notifiable events - inspection	5	1		1
	Desk-based	Concerns - desk-based	1			
		Notifiable event - desk-based				

TABLE 5: Proactive and reactive site and desk based assessments conducted in Q2 2019/20

Figure 11 shows the number of proactive and reactive site- and desk-based assessments undertaken by the regulator in Q2 2019/20. This quarter 65% of our activities were site-based, and 94% of activities were proactive.

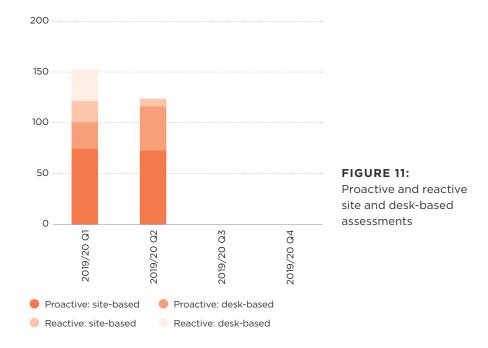
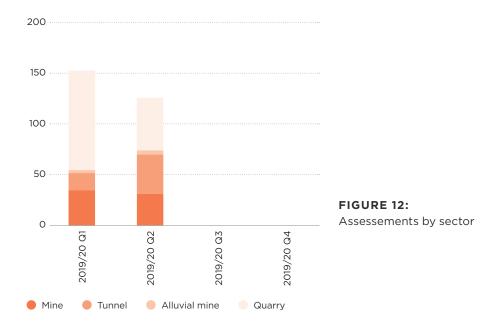


Figure 12 shows the number of assessments undertaken by the regulator in Q2 2019/20 by sector. This quarter, 41% of our assessments were for quarries, 31% for tunnels, 25% for mines and 3% for alluvial mines.



3.3 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 13 and 14 show the number of enforcement actions issued in Q2 2019/20 by notice type and by sector. This quarter, a total of 103 enforcement actions were issued. Of those, 2% of were prohibition notices, 11% were improvement notices, 87% were directive letters and 1% were sustained compliance notices. The majority of the enforcement actions were issued to the mining (48%) and quarrying (47%) sectors.

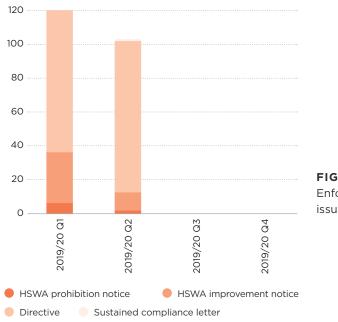


FIGURE 13: Enforcement actions issued by type

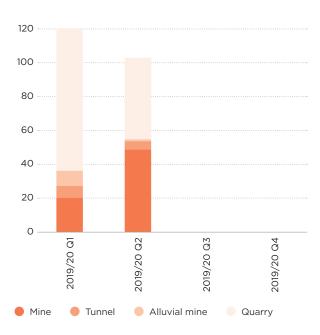


FIGURE 14: Enforcement actions issued by sector

Figure 15 shows the number of enforcement actions issued in Q2 2019/20 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 (19%), worker health (18%) and guarding (16%).

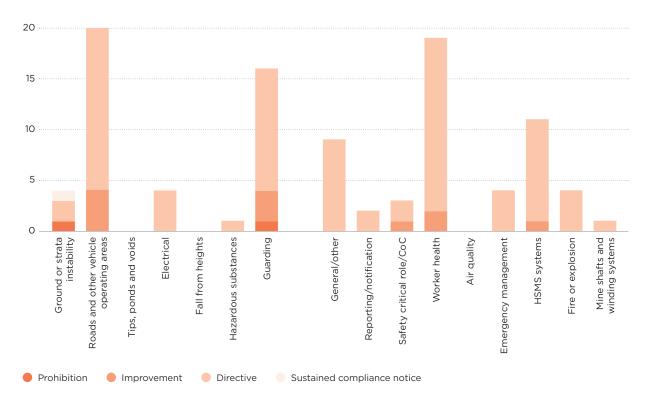


FIGURE 15: Enforcement actions issued by category 2019/20 Q2

Disclaimer

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