

Mine Health and Safety Inspectorate



mineral resources

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA

2017/18

# Annual Report



# ANNUAL REPORT

## 2017/2018

Mine Health and Safety Inspectorate

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## PREFACE

This document is a report by the Chief Inspector of Mines (CIOM) on health and safety at mines and the activities of the Mine Health and Safety Inspectorate (MHSI), compiled as required by section 49(1)(j) of the Mine Health and Safety Act, 1996 (Act 29 of 1996), as amended (MHSA).

The MHSI, established in terms of the MHSA, as amended, has the responsibility of protecting the health and safety of persons working at mines and those who are affected by mining activities.

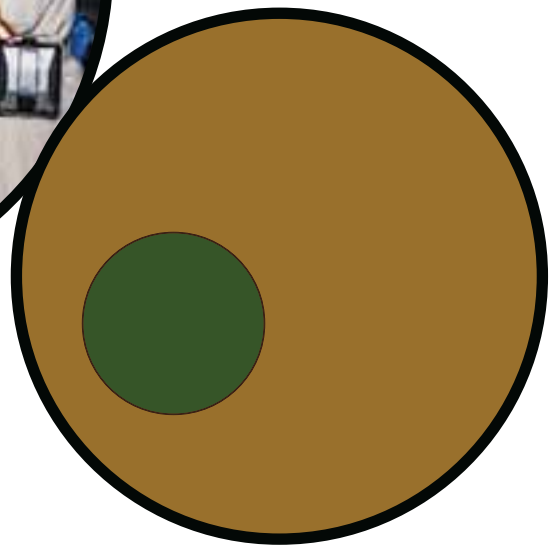
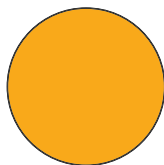
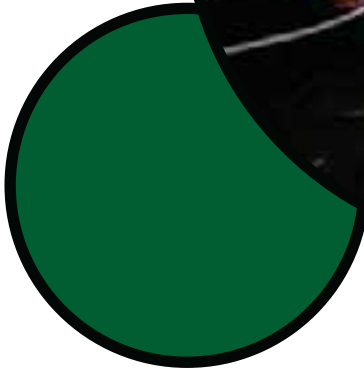
The CIOM also has the responsibility of leading the tripartite structures formed in terms of the MHSI as Chairperson of the Mine Health and Safety Council (MHSC) and the Mining Qualifications Authority (MQA).

The MHSC consists of representatives of the state, organised labour, and employer organisations. The Council was established to advise the Minister of Mineral Resources on health and safety issues and to promote a health and safety culture in the mining industry.

The MQA is the Sector Education and Training Authority for the minerals and mining sector and is responsible for the education and training needs of the mining industry. The MQA was also established under the Skills Development Act No 97 of 1998.

The activities of the above-mentioned two bodies are intricately linked with those of the MHSI and their accounts are captured in their respective annual reports.

# GENERAL INFORMATION



## I. GENERAL INFORMATION

### I.1 Submission of the Annual Report to the Executive Authority

Mr. S.G. Mantashe

Minister of Mineral Resources

Republic of South Africa

Dear Minister

I am pleased to present to you the Annual Report of the Mine Health and Safety Inspectorate (MHSI) for the 2017/2018 period under review. This report is in accordance with the requirements of section 49(1)(j) of the MHSA, as amended.

Yours sincerely



**MMA Zondi**

**Acting Chief Inspector of Mines**

**Mine Health and Safety Inspectorate**

## **I.2 Mission statement**

The MHSI strives towards a safe and health mining industry. This is to be achieved by reducing mining-related deaths, injuries and occupational diseases through the formulation of national policy and legislation, the provision of advice and the application of systems that monitor and enforce compliance with the law in the mining sector.

## **I.3 Legislative mandate**

The MHSI was established in terms of the MHSA, as amended, for the purpose of executing the statutory mandate of the MHSI in safeguarding the health and safety of mine employees and communities affected by mining operations.



## 1.4 Executive summary: Chief Inspector of Mines

It is with great honour and pleasure that I present this report on the state of health and safety in the South African mining industry and the activities of the MHSI for the 2017/18 financial year.

### Staffing

The establishment of the Inspectorate provides for 303 posts of which 267 are currently filled and 36 posts are vacant. The demographics of the Inspectorate as on 31 March 2018 were as follows:

Gender	African	White	Asian	Coloured	Total
Male	127	20	0	0	147
Female	107	7	0	6	120

### Implemented training

During the 2017/18 reporting period, the MHSI developed the skills and knowledge base of its staff as follows:

- A total of 84 officials attended technical and non-technical training courses, and conferences during the reporting period.
- Two managers attended the Advanced Management Development Programme (AMDP) and were found competent.

### Training interventions

#### Assistant Inspector Programme

Two Assistant Inspectors with Electrical and Mechanical Engineering tertiary qualifications that were recruited during the previous financial year to undergo Inspector training at various regional offices and had not yet attained their Government Certificate of Competency (GCC) during the reporting period.

The Department of Mineral Resources (DMR), as at the end of financial 2017/18, had 40 Assistant Inspectors in various regional offices specialising in the fields of electrical engineering, mechanical engineering, mining engineering, mine survey and occupational hygiene.

During the year under review, 17 Assistant Inspectors obtained their respective GCC and seven obtained Bachelor of Technology (B Tech) degrees from the University of Johannesburg.

#### Bursary scheme

The MHSI had, through its Human Resource Development (HRD) initiative, invested in two bursary holders who completed their qualifications during the year under review.

### Current health and safety performance

#### Occupational health

There was an increase in the number of statutory reports submitted by mines to the Department between 2016 and 2017. The inspectorate analysed the reports and developed strategic measures aimed at ensuring compliance and remedial actions to minimise impacts associated with health hazards at our mines.

During the reporting period there was a slight reduction in all overexposures to occupational hygiene stressors was noted, with an exception of thermal heat, where there has been a sudden increase in overexposures as

compared to the previous year. There 68% of the employees that are over exposed to high noise levels and more effort must be needed to make sure that exposure levels are drastically reduced.

A continued improvement has also been noted with the submission of Annual Medical Reports (AMRs) by operating mines and this corresponds to a 9% increase. There was a 3% decrease in the number of occupational diseases from 4 483 in 2016 to 4 632 in 2017. The majority of diseases were due to pulmonary tuberculosis, noise induced hearing loss and silicosis. The most occupational diseases were reported by the gold, platinum and coal sectors.

### **HIV/Aids and TB**

The Department has aligned its work in the spheres of HIV and TB the strategies from the Department of Health. During the period under review, the majority of mines complied with the reporting requirements, as compared to 2016. The analysis of TB and HIV matters is based on data contained on DMR 164 form received from the mines.

In 2017, total compliance for the integrated HIV and TB policy was above at 90%, while compliance for integrated HIV and TB programme was below 80%. Although the overall HIV and TB programme budget at mines stood at 57.2%, the diamond sector contributed to the lowest compliance relating to the HIV and TB programme budget.

There is an overall increase in the number of mines that have submitted DMR 164 forms, which resulted in an overall improvement in compliance measures. However, both diamond and coal sectors reported a decline in numbers of employees due to downsizing.

The total number of employees diagnosed with TB was less in 2017 compared to 2016 figures. A very small percentage of employees who were screened for TB were diagnosed positively and this could be attributed to the impact of TB awareness campaigns that take place in the mining industry.

Mines that did not do well have been identified and will be consulted and visited accordingly. There are still mines that do not have integrated TB and HIV policies yet. Policies must have guidelines on key strategies and implementation plans. Mines must dedicate budgets for TB and HIV programmes irrespective of sector or size.

### **Occupational safety**

It is regrettably that there were 88 fatalities reported in 2017 compared to 73 in the previous year. It is important to note this was the first time that fatalities increased over a ten-year period since 2007. This translates to a 21% increase year-on-year. Fatalities per commodity in 2017 were as follows: gold (39), platinum (27), coal (10) and other mines (12). In the category of other mines, this includes diamond, chrome, copper and iron ore. This poor performance goes against the November 2016, Mine Health and Safety Summit stakeholders' commitment to eliminate fatalities by 2020.

The 2017 fatal statistics revealed that gold and platinum sectors remain the highest contributors to accidents and subsequently, to loss of lives in the mining industry. This is regrettable, as we believe that these mines should be at the forefront in terms of the development of expertise and appropriate systems to enhance health and safety. The gold sector had an unprecedented high number of seismic accidents that claimed the lives of 14 employees in 2017. Most fatalities in the sector are due to fall of ground accidents, followed by those caused by machinery and mobile equipment.

During the 2017 reporting period, the overall number of injuries decreased by 6% compared to 2016. The injuries reported in 2017 were 2 664 compared to 2 847 in 2016.

## Disaster-type accidents

There were two disasters reported in 2017 at the gold mines. Both involved fall of ground due to seismic events.

The first disaster at Tau Lekoa Mine, led to four employees being fatally injured in a seismic-induced fall of ground accident that resulted in a sudden closure of a winze where these four employees were working. They were recovered by Proto Teams.

In the second disaster at Kusasaletu Mine, five bodies of the now deceased employees were recovered from underground after a 1.2 magnitude seismic event had trapped seven employees underground. Two of the seven employees managed to escape to surface after the incident.

## Illegal mining

Illegal mining activities, especially of gold and chrome, in South Africa continue to present health and safety challenges and has spread within most of the regions. These activities take place at abandoned mines and/or at operating mines with illegal miners often operating under dangerous conditions.

Our inspectors, responsible for regulating health and safety at mines, are therefore exposed to threats of violence from perpetrators. Mine employers are continuously encouraged to report illegal operations to their nearest South African Police (SAPS) station for further attention.

The Department, in conjunction with the land developers, affected municipalities and mining companies, have rehabilitated or cleaned up several areas that were previously infested by illegal mining activities.

The Department will continue to collaborate with law enforcement agencies and other stakeholders to ensure the implementation of strategies to combat illegal mining activities.

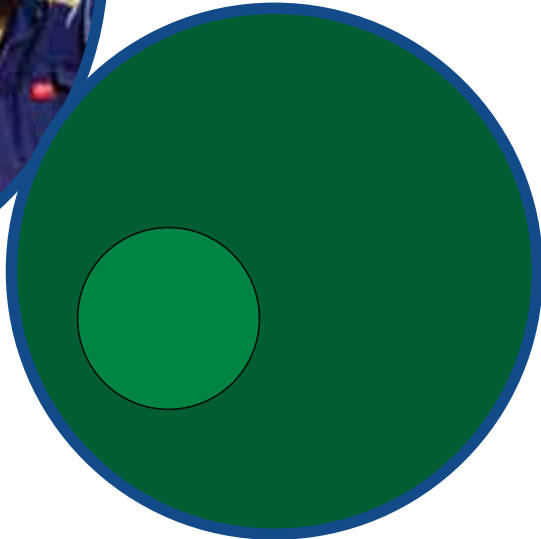
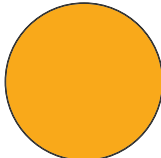
## Women in mining

During the period under review, three women lost their lives when two of them were run over by trackless mobile equipment (TMM) and the other one was fatally injured by a fall of ground.

A fall of ground accident occurred in a gold mine in the Free State. The deceased was employed as a Miner's Assistant. There were four other employees that were involved in the accident. They were caught up in a fall of ground accident in a decline working place. Three employees escaped with minor abrasions and one employee sustained multiple lacerations but was stable. The hanging wall conditions, where they were working, were identified as friable and the area was characterised by shale and faulting.

The second accident, occurred in a coal mine in Mpumalanga. A fitter and was fatally injured when she was struck by a Load Haul Dumper (LHD). It would appear that the LHD struck her between the splits in transit to off-load roofbolts onto the section roofbolter. The employee was run over by a drill rig underground in a platinum mine, in Limpopo.

# PROGRAMME PERFORMANCE



## 2. PROGRAMME PERFORMANCE

### 2.1 Aim of the programme

The MHSI was established in terms of the MHSAs, as amended. The aim of the programme is to carry out the constitutional mandate of the DMR to protect the health and safety of persons working at mines and people residing in nearby communities that are directly affected by mining activities. This is done by performing statutory inspections and audits, the enforcement of the MHSAs and its regulations, as well as well as conducting investigations and inquiries at South African mines.

The programme also administers the GCC for the mining sector. It consists of two sub-programmes: Governance, Policy and Oversight, and Mine Health and Safety (regions).

### 2.2 Purpose of the programme

To execute the statutory mandate of the DMR to protect the health and safety of mine employees and people affected by mining activities.

### 2.3 Service delivery objectives and indicators

The MHSI's strategic plan and achievements during the period under review are outlined in Table 2.3. This is an account of progress achieved in the period under review against the annual targets set for achieving the strategic objectives of the MHSI.

**Table 2.3 Service delivery objectives and indicators**

Measures/ initiatives	Status	Performance Analysis	Corrective Action	Current Target	Current Actual
<b>Measures</b>					
Administration of the GCC exams policy.	G	Achieved. All the five steps for the Certificate of Competency Model have been implemented. These consist of the following steps: 1. Set the papers. 2. Write the exam. 3. Mark the exam. 4. Moderate the results. 5. Release the results. Calculation $5/5 * 100 = 100\%$		100	100
Mining and Health Safety Annual Report submitted.	G	Achieved. Annual Report has been submitted and tabled in Parliament. Calculation: $1/1 * 100 = 100\%$		1	1
Number of audits conducted (cumulative), individual audits included.	G	Achieved. The reason for over achievement is that there were extra audits carried out in an attempt to reduce FOG accidents. Total fourth quarter is 527; cumulatively from the first, second and third quarter audits. Verification source: Summary of Audit Report.		396	527
Number of inspections conducted (cumulative).	G	Achieved. The reason for the over achievement is due to the extra inspections that were conducted in an attempt to reduce accidents. Calculation: Cumulative total of the four quarters cumulative is 9425. Verification source: Summary of Inspection report.		8 000	9 425

Measures/ initiatives	Status	Performance Analysis	Corrective Action	Current Target	Current Actual
<b>Measures</b>					
Number of tripartite workshops conducted.	G	Achieved: Total of first quarter is 18, second quarter is 40, third quarter is 59 and cumulatively in the fourth quarter, 76 tripartite workshops were held. The reason for over achievement under this measure is due to the request from stakeholders (unions and employers). Verification source: Summary of tripartite workshops conducted.		40	76
Percentage of inquiries completed (initiated vs completed).	G	Achieved: The number of inquiries initiated is 50 and 42 were completed. The reason for over achievement is availability of witnesses. Average percentage achieved is 100%. Calculation: $(42/50) \times 100 = 84\%$ . Verification source: Summary of inquiries.		80	84
Percentage of investigations completed (initiated vs completed).	G	Achieved. The reason for over achievement was that the availability of witnesses improved during this quarter. The number of investigations initiated is 377 and the number completed is 369. Calculation: $(369/377) \times 100 = 98\%$ . Verification source: Summary of investigation reports.		80	98
Percentage reduction in occupational diseases (including TB).	G	Achieved. Significant improvement in TB and silicosis cases reported from April to March 2017 which was 3 531 compared with the same period in 2018 where 3 056 cases were reported. Calculation: $(3056-3531)/3531 \times 100 = -13\%$ . Verification source: Summary of reports April 2017 to March 2018.			
		Reasons for over achievement - not all mines have been reporting accurately and that has been corrected. During occupational health workshops and other forums, issues of reporting correctly have been emphasised as well as highlighting that double reporting by the mines must be avoided.			
		There are occupational health awareness campaigns held for employees to promote health by the mines. Guidelines are developed and revised.		10	-13
Percentage reduction in occupational fatalities.	R	Not achieved. The reason for not achieving is due to the increase in fall of grounds accidents. There were 81 recorded fatalities between April 2016 to March 2017 and 80 between April 2017 to March 2018 Calculation: $(80-81)/81 \times 100 = +1\%$ . Verification source: Summary of fatalities.	The inspectorate will continue to monitor compliance and ensure that effective safety management systems are implemented. Engagements will also be held with the Chief Executive Officers (CEOs) of mining companies to ensure that appropriate measures are implemented to prevent harm to the mine workers in the mining industry.	20	1

Measures/ initiatives	Status	Performance Analysis	Corrective Action	Current Target	Current Actual
<b>Measures</b>					
Percentage reduction in occupational injuries.	Y	Partially achieved. The reason for partial achievement is due to the increase of fall of grounds accidents and transportation in mining accidents. There were 2 874 injuries reported between April 2016 to March 2017 and 2 499 injuries reported between April 2017 and March 2018. Calculation: $(2499-2874)/2874*100 = -13\%$ . Verification source: Summary of occupational injuries.	The Inspectorate will continue to monitor compliance and ensure that effective safety management systems are implemented in the mining industry. Engagements will also be held with the CEOs of mining companies to ensure that appropriate measures are implemented to prevent harm to mine workers.	20	-13
Percentage of identified Internal processes developed and/or reviewed.	G	Achieved. There was one instruction issued in the fourth quarter. Calculation: $1/1*100=100\%$		100	100
Percentage adherence to existing Service Level Agreements (SLAs).	G	Achieved. SLA with Mine Rescue was used and honoured. Calculation: $(1/1)*100=100\%$		100	100
Percentage adherence to prescribed timeframes administrative for tasks.	G	Achieved: The average percentage completed is 91% in quarter four. There were 1 453 applications completed and processed within 30 days and 1 319 received and processed. Calculation: $(1319/1453)*100 = 91\%$ . Verification source: Summary of Admin Register.		80	91
Percentage adherence to prescribed timeframes for CIOM appeals.	G	Achieved. There were 5 CIOM appeals received and completed within the prescribed timeframe. Calculation: $(5/5)*100=100\%$		100	100
Percentage adherence to prescribed timeframes for medicals appeals.	G	Achieved. There were 47 appeals received and 38 appeals completed. Calculation: $(38/47)*100=80\%$ . Verification source: Summary of medical appeals.		80	80
Percentage adherence to prescribed timeframes for MPRDA applications	G	Achieved. There were 2 231 applications completed/processed within 30 days and 2 234 received/all processed. Calculation: $(2231/2234)*100=100\%$ . Verification source: Summary of admin register.		100	100
Percentage adherence to compliance framework.	G	Achieved. All identified items on the compliance checklist have been achieved. Calculation: $(5/5)*100=100\%$		100	100
Percentage implementation of Management Action Plan (External audit).	G	Achieved. All findings identified were implemented on time. Calculation: $1/1*100=100\%$		100	100

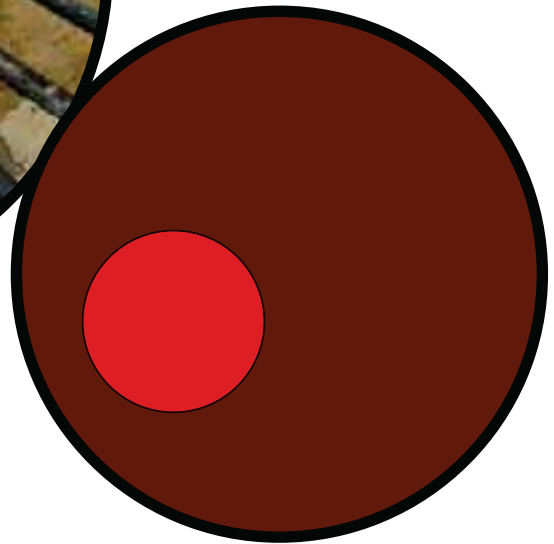
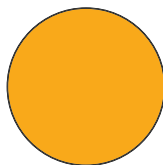
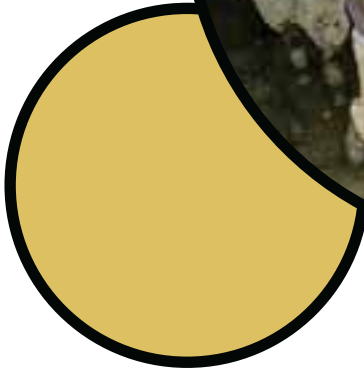
Measures/ initiatives	Status	Performance Analysis	Corrective Action	Current Target	Current Actual
<b>Measures</b>					
Percentage implementation of Management Action Plan (Internal audit)	G	Achieved. All 15 management action plans were implemented. Calculation: $15/15 * 100 = 100\%$ .		100	100
Percentage Implementation of Risk Management Plans	G	Achieved. There were three risks identified and implemented. Calculation: $(3/3) * 100 = 100\%$ .		100	100

## 2.4 Service Delivery Improvement Plan

KEY SERVICE	SERVICE BENEFICIARY	DESIRED STANDARD (2017/18)		Progress as at 31 March 2018
Address health and safety risks in mining through: Number of audits conducted. Number of inspections conducted. Number of investigations conducted. Number of inquiries completed.	Mining operations	Quantity	100% of planned audits as per capacity.  100% of planned inspection as per capacity 80% of planned investigations as per capacity. 80% of planned inquiries as per capacity.	133% of planned audits as per capacity. 117% of planned inspections as per capacity. 98% of planned investigations as per capacity. 84% of planned inquiries as per capacity.
		Quality	Implementation and compliance to standardised policies and procedures.	Achieved.
		Consultation	Quarterly consultations with mining operations.	Achieved.
		Open and transparency	Policies and procedures are public documents.	Achieved.
		Information	Information is shared on a monthly basis with mines.	Achieved.
		Value for money	Ensure the optimal utilisation of voted funds.	Achieved.



# STATE OF SAFETY IN THE SOUTH AFRICAN MINING INDUSTRY



### 3. STATE OF SAFETY IN THE SOUTH AFRICAN MINING INDUSTRY

#### 3.1 Accident statistics

The accident statistics indicate that fatalities and injuries continue to pose a challenge for the South African mining industry. An increase of 21% in the number of fatalities reported is above the Mining Industry Summit milestone of a yearly 20% reduction. The Summit targets were agreed to by all the tripartite stakeholders. A total of 88 fatalities were reported in 2017 compared to 73 fatalities reported in 2016. The number of mine injuries reported in 2017 shows a slight improvement of 6% from 2 846 reported in 2016 to a provisional figure of 2 664 reported in 2017.

##### 3.1.1 The number of employees at work in the South African mining industry

There has been a slight increase of 1% in the number of employees at work in the South African mining industry from 433 980 in 2016 when compared to 439 929 in 2017. Table 3.1.1 shows a decrease in the gold and diamond sectors while the number of employees at work in the other commodities shows an increase.

Table 3.1.1: Number of employees at work (2016 compared with 2017)

	2016	2017	Percentage change
Total	433 980	439 929	1
Gold	109 518	106 107	-3
Platinum	155 524	157 268	1
Coal	69 223	74 255	7
Diamonds	19 308	18 640	-3
Copper	3 087	3 102	0.5
Chrome	15 277	16 947	11
Iron ore	16 146	17 045	6
Manganese	7 234	7 671	6
Other mines	38 663	38 893	1

#### 3.2 Analysis of accident rate trends

##### 3.2.1 Fatality and injury rates per million hours worked

The fatality and injury rates per million man hours worked is a number calculated using a rounded off figure conversion factor of 2 200, as the mines do not report the actual hours worked. The assumption is that each person works for an average of 48.9 weeks in a calendar year, when discounting weekends, public holidays and annual leave days. The Basic Conditions of Employment Act, 1997 (Act 75 of 1997), requires a person not to work in excess of 45 hours per week. Therefore, the conversion factor is rounded off to 2 200 hours per person per year. The rate is annualised; therefore, it must be for a full year:

$$\text{Fatality/Injury rate} = \left\{ \frac{\text{Number of fatalities/injuries for calendar year}}{(\text{Number of persons at work} \times 2\,200)} \right\} \times 10^6 \text{ hours}$$

### 3.2.2 Fatality rates per region

In terms of Section 47(2) of the MHS Act, the Minister has, by notice in the Government Gazette, established regions of the country for the purpose of administering this Act. Table 3.2.2 shows the number of fatalities reported in each of the regions of the Inspectorate, as well as the fatality frequency rates (FFR) during the calendar years 2016 and 2017. There was an increase in fatalities reported to the regions year-on-year and an increase in the number of employees at work. The fatality rate increased from 0.08 in 2016 to 0.09 in 2017.

**Table 3.2.2: Fatality rates per region**

	2016	Fatality rates	2017	Fatality rates	Percentage change in rates
<b>All mines</b>	<b>73</b>	<b>0.08</b>	<b>88</b>	<b>0.09</b>	<b>20</b>
Eastern Cape	0	0.00	1	0.27	100
Free State	12	0.16	10	0.14	-14
Gauteng	19	0.13	20	0.13	5
KwaZulu-Natal	0	0.00	1	0.04	100
Limpopo	4	0.04	6	0.06	48
Mpumalanga	3	0.02	13	0.08	309
Northern Cape	7	0.09	1	0.01	-86
North West: Klerksdorp	2	0.05	8	0.20	302
North West: Rustenburg	26	0.08	26	0.08	0.08
Western Cape	0	0.00	2	0.16	200

### 3.2.3 Injury rates per region

The overall injury rate decreased by 7% during 2017 when compared to 2016. The figure of injuries reported for 2017 was 2 664 as opposed to a figure of 2 846 injuries reported in 2016. Table 3.2.3 indicates the number of injuries reported in each region and the injury rate during 2016 and 2017.

**Table 3.2.3: Injury rates per region**

	2016	Injury rates	2017	Injury rates	Percentage change in rates
<b>All mines</b>	<b>2 846</b>	<b>2.97</b>	<b>2 664</b>	<b>2.75</b>	<b>-7</b>
Eastern Cape	6	1.51	3	0.79	-48
Free State	273	3.70	250	3.50	-5
Gauteng	680	4.49	587	3.87	-14
KwaZulu-Natal	47	1.70	20	0.84	-51
Limpopo	135	1.32	206	1.99	51
Mpumalanga	193	1.20	205	1.20	0
Northern Cape	130	1.66	104	1.26	-24
North West: Klerksdorp	252	6.34	193	4.88	-23
North West: Rustenburg	1 114	3.61	1 088	3.53	-2
Western Cape	16	1.27	8	0.64	-49

### 3.2.4 Fatality rates per commodity

The fatality rates for the mining industry increased by 13% from 0.08 in 2016 to 0.09 in 2017, although the number of employees at work shows a slight increase of 1% in 2017. Table 3.2.4 shows the fatality rates per commodity for 2016 and 2017. The fatality rates for the gold, diamond and platinum sectors show the highest increases of 0.17, 0.10 and 0.08% respectively.

**Table 3.2.4: Fatality rates per commodity**

	2016	Fatality rates	2017	Fatality rates	Percentage change in rates
All mines	73	0.08	88	0.09	13
Gold	30	0.12	39	0.17	34
Platinum	28	0.08	28	0.08	0
Coal	4	0.03	10	0.06	100
Diamonds	3	0.07	4	0.10	43
Copper	0	0.00	0	0.00	0
Chrome	1	0.03	1	0.03	0
Iron ore	3	0.08	0	0.00	-100
Manganese	1	0.06	0	0.00	-100
Other mines	3	0.04	6	0.07	75

### 3.2.5 Injuries rates per commodity

The overall injury rates per commodity decreased by 8% from 2.98 in 2016 to 2.75 in 2017. Table 3.2.5 shows that the diamond, platinum and coal sectors increased by 1.6%, 1% and 1% respectively, while copper shows no change.

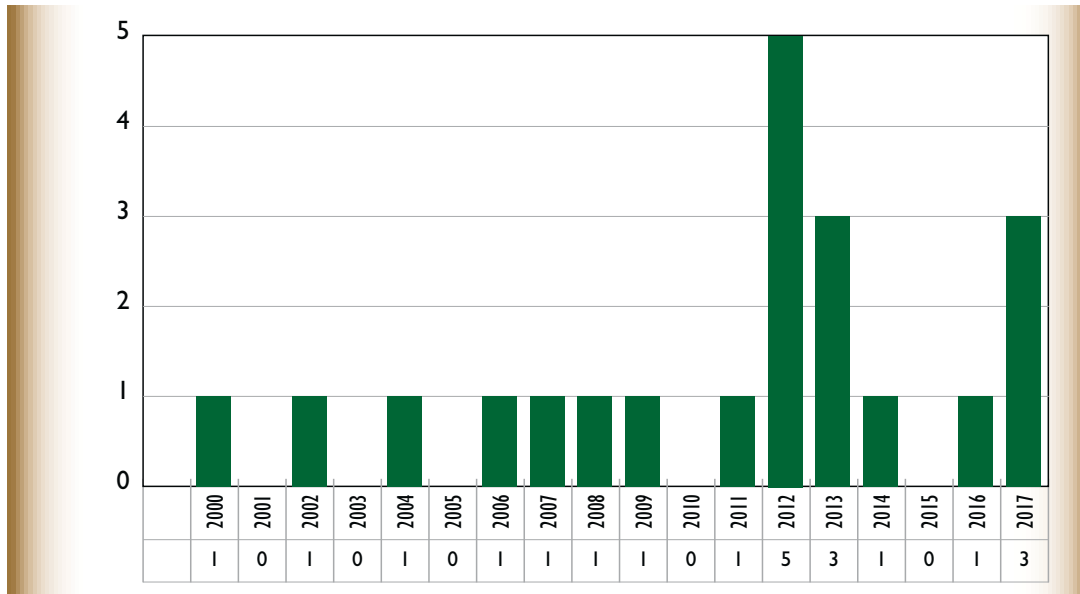
**Table 3.2.5: Injury rates per commodity**

	2016	Injury rates	2017	Injury rates	Percentage change in rates
All mines	2 846	2.98	2 664	2.75	-8
Gold	1 200	4.98	1 018	4.36	-12
Platinum	1 140	3.33	1 156	3.35	1
Coal	189	1.24	200	1.23	1
Diamonds	53	1.25	52	1.27	1.6
Copper	10	1.47	10	1.47	0
Chrome	58	1.73	30	0.80	-54
Iron ore	41	1.15	28	0.75	-35
Manganese	19	1.19	23	1.32	11
Other mines	136	1.60	147	1.71	7

### 3.2.6 Fatalities: Women in mining

Three women were fatally injured in 2017 compared to one woman in 2016. This translates to an increase of 200% year-on-year. Although a fatality of a mine worker is regrettable, irrespective of gender, figure 3.2.6 shows that there has been a decline in women fatalities since 2012.

Figure 3.2.6: Actual fatalities – women in mining from 2000 to 2017



### 3.2.7 Injuries: Women in mining

There has been an increase in the number of injuries involving women in mining. The injuries that were reported involving women were mainly in the general classification (68%). These accidents were linked to slipping and falling, material handling and being struck by object.

Figure 3.2.7(a): Number of injuries to women in mining from 2001 to 2017

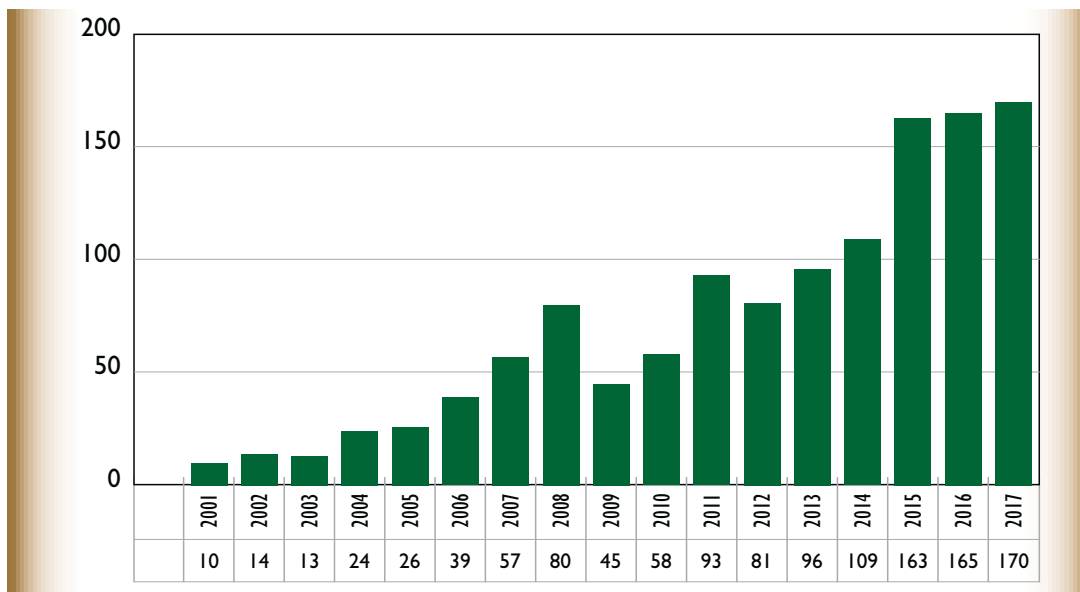
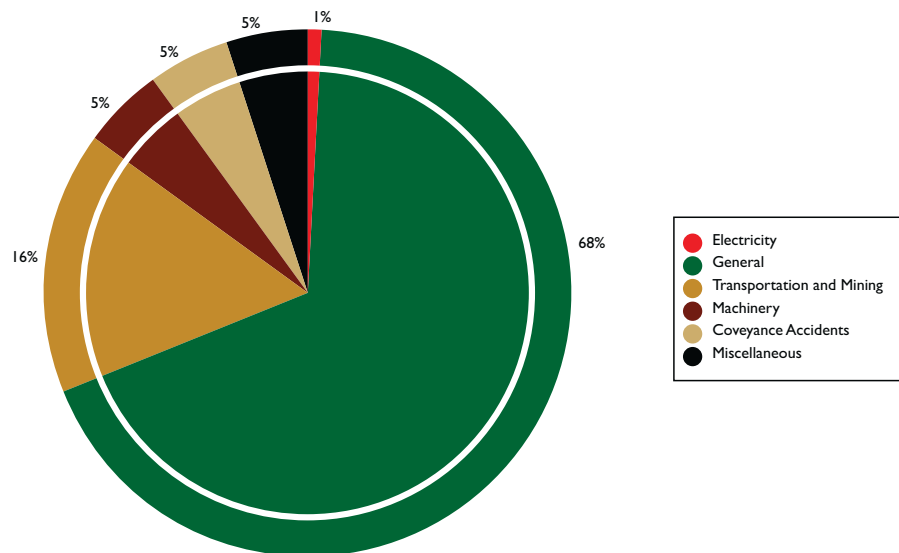


Figure 3.2.7(b): Classification of injuries to women in mining from 2001 to 2017



### 3.2.8 Fatalities classified by casualty classification

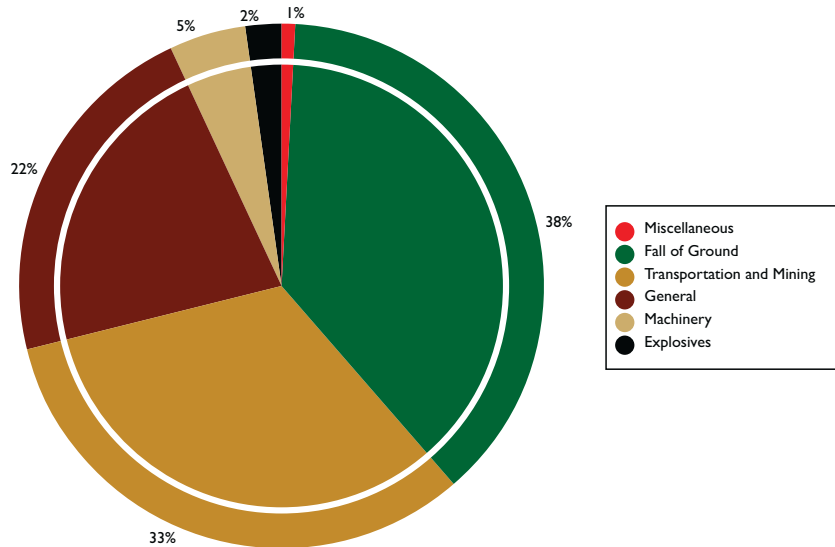
The 88 fatalities that were reported in 2017, as indicated in Table 3.2.2 and Table 3.2.4, are further classified in Table 3.2.8. The highest ranking classification of fatalities during 2017 followed the same trend of the highest ranking classification of fatalities during 2016, which were caused as a result by fall of ground (FOG), transportation and mining (T&M), as well as general accidents at 37%, 33% and 22% respectively. These classifications were 33%, 32% and 22% respectively in 2016.

Table 3.2.8: Fatalities classified by casualty classification

	1 January to 31 December 2016	1 January to 31 December 2017	Percentage change
<b>FOG</b>	24	33	38
Rockburst	9	12	33
Gravity	15	21	40
<b>Machinery</b>	4	4	0
Conveyor belts	4	4	0
Drives, belts, chains	0	0	0
Other	0	0	0
<b>Track-bound transport</b>	9	12	33
Locomotive	2	4	100
Locomotive-drawn vehicle	4	6	50
Rerailing	1	1	0
Coupling/uncoupling	2	1	-50
<b>Winches</b>	6	5	-17
Scraper winch installation	4	5	25
Winch installation	1	0	-100
Double drum winch	1	0	-100
<b>Trackless mobile machines (TMM)</b>	8	14	75
Tractor/trailer	0	5	500
Mechanical loaders	1	2	100

	I January to 31 December 2016	I January to 31 December 2017	Percentage change
Coal-mining machines	2	0	200
Transporters	5	5	0
Motor vehicles	0	1	100
T&M lifting machines	0	1	100
<b>General</b>	<b>16</b>	<b>18</b>	<b>13</b>
Fall of material/rolling rock	4	3	-25
Manual handling of material	1	0	-100
Manual handling of mineral	0	0	0
Falling in/from	1	4	300
Slipping and falling	1	3	200
Burning and scalding	1	0	-100
Dust, gas and fumes	5	6	20
Inundation/drowning	3	1	-67
Struck by – manual handling	0	1	100
<b>Conveyance accidents (s/w)</b>	<b>2</b>	<b>0</b>	<b>-200</b>
<b>Electricity (not causing fires)</b>	<b>1</b>	<b>0</b>	<b>-100</b>
<b>Fires</b>	<b>1</b>	<b>0</b>	<b>-100</b>
<b>Explosives</b>	<b>0</b>	<b>2</b>	<b>200</b>
<b>Diving sickness</b>	<b>1</b>	<b>0</b>	<b>-100</b>
<b>Miscellaneous</b>	<b>1</b>	<b>0</b>	<b>-100</b>
<b>Total</b>	<b>73</b>	<b>88</b>	<b>21</b>

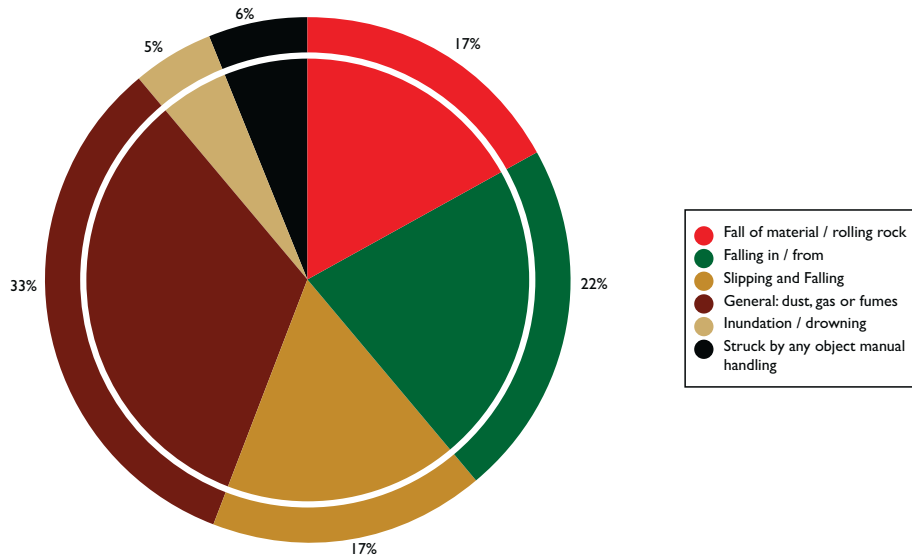
Figure 3.2.8: Fatalities classified by casualty classification



### 3.2.8.1 Breakdown of fatalities classified as general-type accidents

The classification of general accidents (22%) shows no percentage change from 2016. These are accidents that result in fatalities related to fall of material/rolling rock, manual handling of material, falling in/from, slipping and falling, contact with, splinters, exposure to dust/gas/fumes inhalation (gassing), inundation/drowning and struck by. This classification is further broken down in figure 3.2.8.1.

**Figure 3.2.8.1: Sub-classification of general classification of fatalities in 2017**



### 3.2.8.2 Breakdown of fatalities classified as fall of ground-type accidents

There were 33 fatalities classified under fall of ground in 2017 compared to 24 fatalities reported in 2016. This translates to an increase of 38% year on year. Twelve of the fall of ground FOG fatalities reported in 2017 were seismic-related, compared to nine reported in 2016, while 21 fall of ground fatalities reported in 2017 were gravity related, compared to 15 reported in 2016.

### 3.2.8.3 Breakdown of fatalities classified as transportation and mining-type accidents

There were 30 fatalities reported in this category in 2017 compared to 23 reported in 2016. This translates to an increase of 30% year-on-year. Fatalities reported in this classification in 2017 included four that were related to locomotives, six that were related to locomotive drawn vehicles, four that were related to tractors/trailers, two that were related to mechanical loaders, five that were related to transporters, five that were related to scraper winch installations and one each related to rerailing, coupling/uncoupling, motor vehicles and lifting machines.

### 3.2.8.4 Breakdown of fatalities classified as machinery-type accidents

There were four fatalities reported in this classification in 2017 compared to 4 reported in 2016. All the fatalities reported in 2017 in this classification were related to conveyor belts.

### 3.2.8.5 Breakdown of fatalities classified as miscellaneous-type accidents

There were no fatalities reported in 2017 in this classification compared to one that was reported in 2016.

### 3.2.8.6 Breakdown of fatalities classified as electricity-type accidents

There were no fatalities reported in 2017 in this classification compared to one that was reported in 2016.



### 3.2.8.7 Breakdown of fatalities classified as explosives-type accidents

There were two fatalities reported in 2017 in this classification compared to one that was reported in 2016.

### 3.2.9 Injuries classified by casualty classification

**Table 3.2.9: Injuries classified by casualty classification**

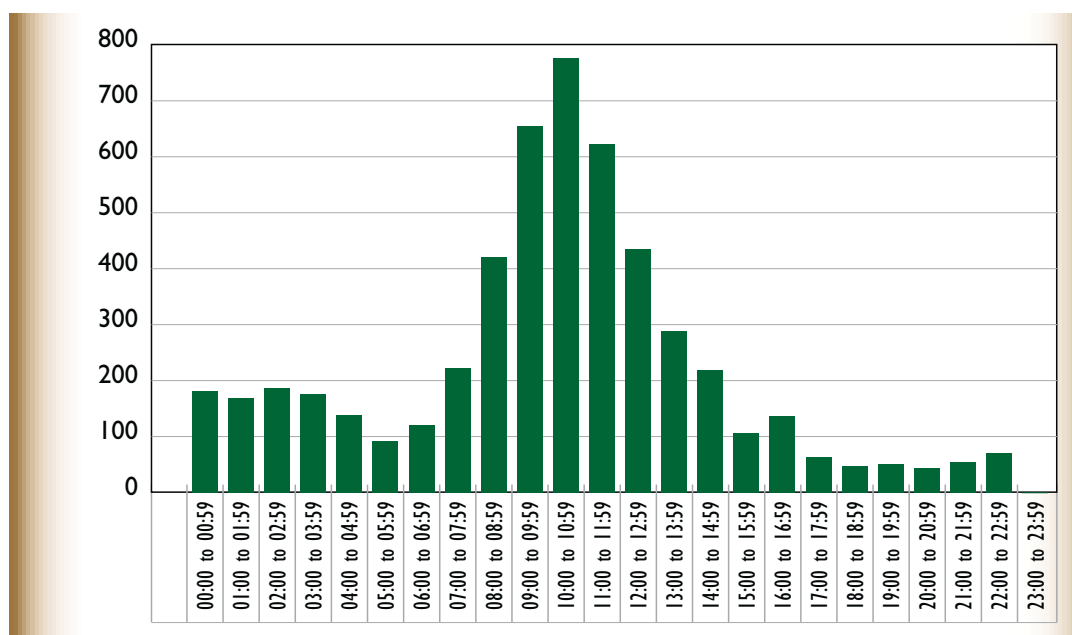
	I January to 31 December 2016	I January to 31 December 2017	Percentage change
<b>FOG</b>	<b>471</b>	<b>443</b>	<b>-6</b>
Rockburst	88	81	-8
Strainburst	49	45	-8
Gravity	334	317	-5
<b>Machinery</b>	<b>211</b>	<b>195</b>	<b>-8</b>
Conveyor belts	53	47	-11
Drives, belts, chains	28	16	-43
Portable power tools	100	100	0
Other	30	32	7
<b>Transportation and mining</b>			
<b>Track-bound transport</b>	<b>147</b>	<b>165</b>	<b>12</b>
Locomotive	47	40	-15
Locomotive-drawn vehicle	54	63	17
Re-railing	9	23	156
Coupling/uncoupling	37	39	5
Rocker arm shovel	19	13	-32
Personnel transport	19	11	-42
Hand trammed	13	15	15
Other (transport)	8	6	-25
<b>Winches</b>	<b>102</b>	<b>124</b>	<b>22</b>
Scraper winch installation	90	97	8
Single drum winch	1	10	900
Double drum winch	11	17	55
Mono rope/rail	10	9	-10
<b>TMM</b>	<b>101</b>	<b>113</b>	<b>12</b>
Mechanical loaders	14	23	64
Tractor/trailer	3	6	100
Coal-mining machines	6	4	-33
Transporters	44	44	0
Motor vehicles	11	15	36
T&M lifting machines	26	21	-19
T&M mobile drilling machines	41	21	-49
Other TMM	8	7	-13
<b>General</b>	<b>1529</b>	<b>1393</b>	<b>-9</b>
Fall of material/rolling rock	238	229	-4
Manual handling of material	445	377	-15

	1 January to 31 December 2016	1 January to 31 December 2017	Percentage change
Manual handling of mineral	76	66	-13
Falling in/from	48	48	0
Slipping and falling	465	409	-12
Burning and scalding	31	27	-13
Splinters	34	37	9
Dust, gas and fumes	17	26	53
Inundation/drowning	4	2	-50
Struck by ventilation door	16	17	6
Struck by – manual handling	155	155	0
Conveyance accidents (s/w)	40	27	-33
Electricity (not causing fires)	15	12	-20
Fires	6	8	33
Explosives	7	4	-43
Subsidence/caving	1	1	0
Occupational diseases	1	0	-100
Heat sickness	2	1	-50
Miscellaneous	93	68	-27
<b>Total</b>	<b>2 726</b>	<b>2 484</b>	<b>-9</b>

### 3.2.10 Accidents classified by time of occurrence

Statistics show that accidents that occurred in 2017, when classified by time of occurrence, mainly took place between 07:00 and 14:00. This period is during day shift when there are more people at work. Most underground workers start the morning shift at 06:00 and the peak of accidents occur at mid-shift.

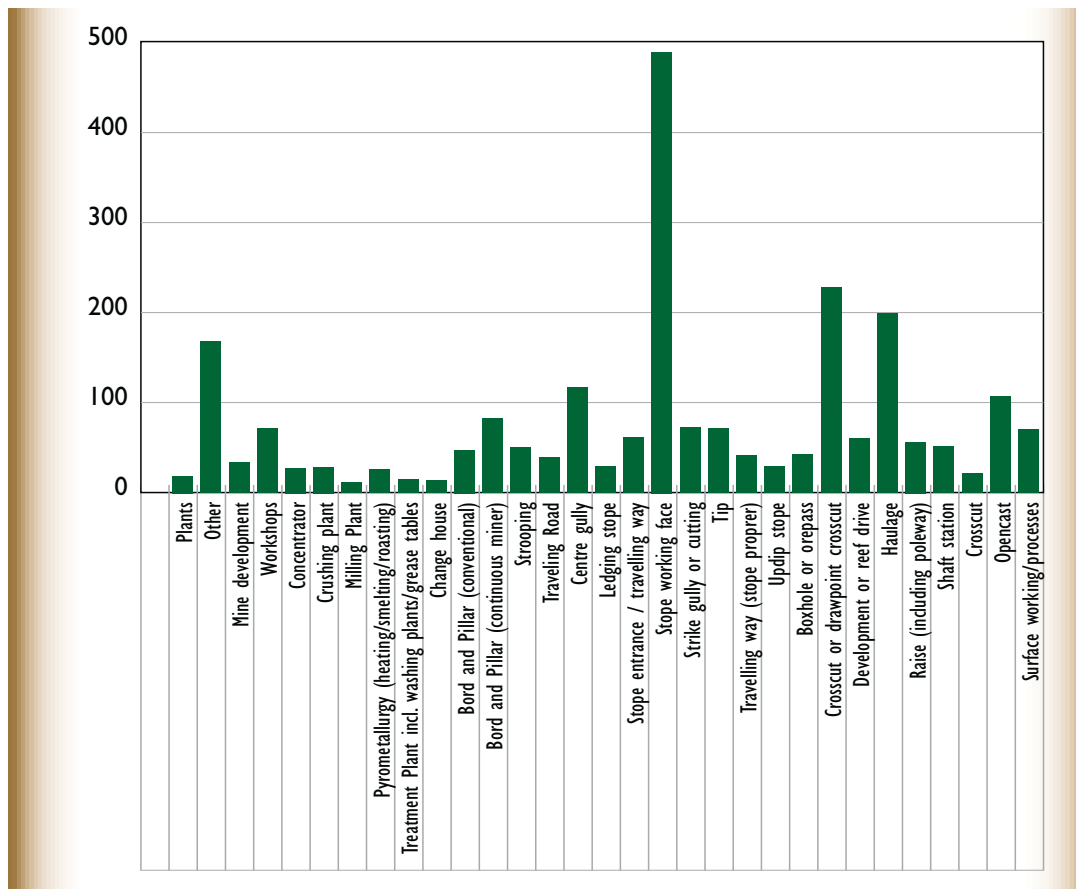
Figure 3.2.10. Accidents classified by time of occurrence



### 3.2.11 Accidents classified by location

The majority of accidents occurred at the stope working face, crosscut or drawing point crosscut and haulage. These are areas with considerable concentration working towards the set production targets.

Figure 3.2.11. Accidents classified by location



## 3.3 Enforcement

### 3.3.1 Section 54 instructions

Section 54 instructions of the MSHA are issued if an Inspector of Mines (IOM) has a reason to believe that any occurrence, practice or condition at a mine endangers, or may endanger, the health and safety of any person at a mine. The IOM may give any instruction necessary to protect the health and safety of persons at that mine. An IOM's instruction may result in the following scenarios:

- Halt the operations at the mine or part of a mine.
- Halt any act or practice at the mine or part of a mine.

The employer must then take steps, as set out in the instruction, or rectify the occurrence, practice or condition. Figure 3.3.1(a) depicts the percentage of section 54 instructions resulting in partial closure or total closure during the period January to December 2017.

Figure 3.3.1(a): Section 54 instructions issued

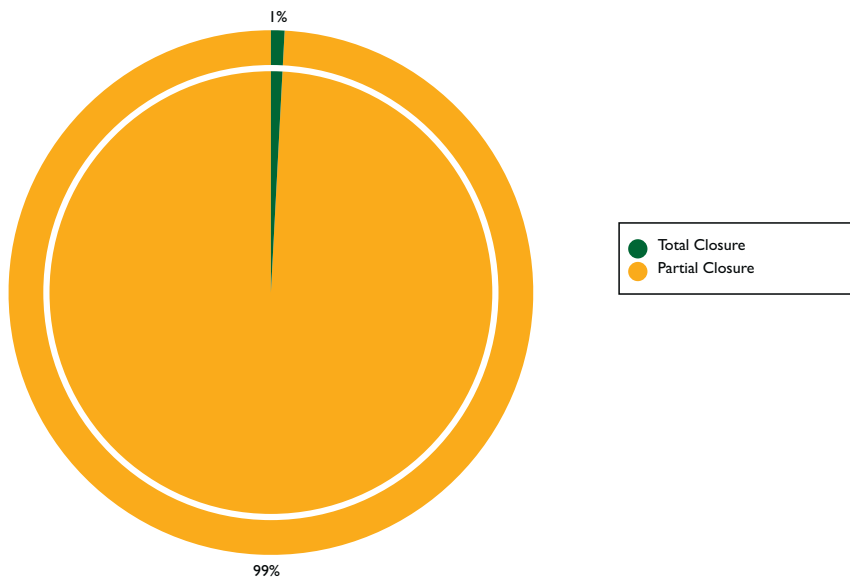
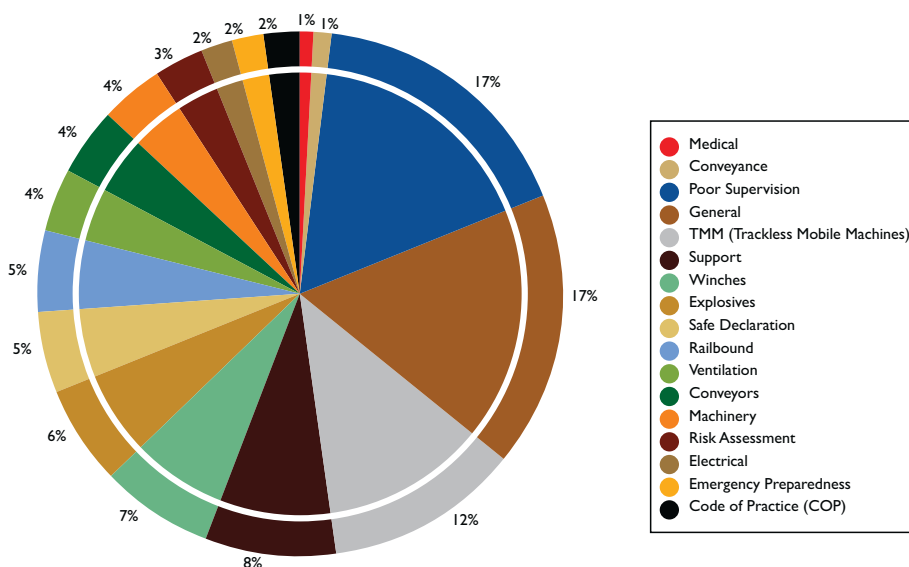


Figure 3.3.1(a) shows that 99% of the section 54 instructions issued during 2017 were partial closures while 1% were total closures. Partial closures were conducted to halt specific parts of working places, practices or conditions at a mine or part of a mine. Most of the total closures were for small, privately run mines where transgressions included no occupational hygiene legal documents in place, employees without medical certificates, no personal protective equipment provided to employees, no mandatory Codes of Practice compiled and/or no legal appointments in place.

The main areas that were covered by the instructions issued are shown in Figure 3.3.1(b). For 2017, general (17%) and poor supervision (17%) accounted for most of the instructions issued, followed by TMM (12%), support (8%), winches (7%) and explosives (6%) in the top five.

Figure 3.3.1(b): Section 54 instructions issued



### 3.3.1.1 General (17%)

This category of transgressions is the second of the two categories that accounted for most of the section 54 instructions issued in 2017. Some of the areas covered were as follows:

- Poor illumination was observed at the crosscut.
- The old tip was found not properly closed leaving apertures of the tip grizzly open and thereby exposing employees to the risk of falling into the ore pass.
- Back area was not demarcated.
- Poor barring was observed.
- Poor start-up at the working place was observed.
- Employees were barring from the down-dip position, watering down was not conducted during barring operation, buddy-buddy system was applied during barring operation and barring was not done solidly in all access ways of the working place.
- The intake airway along the travelling way was barricaded with a wire mesh but it seemed like people were entering the area through a hole on the side.
- Unsafe working practices were observed.
- Lifting equipment storage was found mixed, not safe for use and discarded equipment was found inside.
- There was no water management control system in place.

### 3.3.1.2 Poor supervision (17%)

This category of transgressions is the first of the two categories that accounted for most of the section 54 instructions issued in 2017. Some of the areas covered were as follows:

- The Mine Overseer and Shiftboss had disturbed the scene of accident with the intent of hiding evidence
- Poor supervision and management were observed.
- The miner was found with a malfunctioning Gas Detection Instrument (GDI) which was not sent for repairs as per mine procedure.
- No miner had been appointed to take charge of tramming personnel.
- No working place orientation was done for tramming personnel and no pre-start audits and inspection were done by engineering personnel to ensure safety of Railbound Equipment (RBE) during the mine start-up.
- Poor supervision and management were observed.
- Poor start-up was observed.
- The team leader did not acknowledge the instruction from the miner on the safe declaration document and the team leader did not go in together with the crew during safe declaration.
- The mine was not registered on the South African Mines Reportable Accidents Statistics System (SAMRASS), there were no legal appointments available, there were no Codes of Practice available, there were no Standard Operating Procedures available, there were no reports submitted in terms of the Act and there were no surface survey plans available.

- Persons working (cleaning, maintaining and operating) around conveyor belt were not authorised and the mine was advised from the previous inspection.

### 3.3.1.3 Trackless Mobile Machines (TMM) (12%)

Some of the areas covered were as follows:

- The Light Delivery Vehicle (LDV) was operated with a dysfunctional safety belt interlock.
- Vehicles at the mine were not fitted with Proximity Detection System (PDS) and were working at high risk areas interacting with pedestrians.
- Haul trucks were observed in operation with worn tyres, against the mine procedures.
- Several dump trucks were found with damaged air conditioning systems, brake testing was not conducted as required, pre-use checklist was not marked on brakes items and the operator did not have his operating license in his possession whilst operating.
- Substandard TMMs were observed, where the air conditioner was not in operation, speedometer was not in operation, PDS was not in operation, tyres were worn and engine was leaking oil.
- An articulated dump truck was found working with one light in order, illumination of TMMs was not verified and the mine had a night shift.
- The pre-use checklist for the dozer was marked showing all items were in order but the reverse hooter was found not functional.
- The LDV had failed the brake test, in that the operator tested the park brakes on the test ramp and the vehicle rolled down. The maintenance records for the LDV were requested and were not available.
- A Manitou was being used even though three of its tyres were worn out and damaged.
- Travelling/reverse alarms for the LDV were not functioning.

### 3.3.1.4 Support (8%)

Some of the areas covered were as follows:

- Support on the second line was measured to be 4.7m and 2.8m along the dip instead of the 1.5m mine standard.
- Scaling on the sidewall of the centre gully was observed and support bolts were protruding 0.8m.
- Drilling of roofbolts holes was done without installation of temporary net, temporary net installation was not covering the entire panel, holes at the toe of the panel were drilled under unsupported hanging wall and temporary net installation measured 1.2m from the face against a standard of 0.5m.
- The panel was found not supported and there was no support at the holing.
- Numerous roofbolts adjacent to each other were found to be damaged.
- Two sticks in the back area were 10.2m from the face and were spaced 1.8m apart instead of 1m.
- A support jack with a stone placed underneath as a wedge was observed.
- The nets were observed being supported at weak points with the jacks, at one corner it was observed that the net gave way at the weak point where the jack was supporting it.
- Last line of roofbolts measured 1.6m and 1.3m to the face against a standard of 0.5m before a blast.

- Back area was observed not barricaded off at raise 2 and panel 2 and in the back area there were missing support sticks.

#### 3.3.1.5 Winches (7%)

Some of the areas covered were as follows:

- Winch tip barricade was secured with wires; compressed air hoses were removed thereby disabling the operation of bell wires and bell wires were not installed on the other side of the scraper rope path.
- Gully box connecting the winch was left open exposing electrical wires while the artisan was busy at the winch and the serviceman did not have a lock-out key.
- Unsafe winches and rigging were observed.
- The centre line winch had no operating pull wire, the tip area was found with big rocks and the grizzly was damaged, the electrical terminal box was found not secured, the holding down bolt was not tightened, there was no safety snatch block installed on the Rolled Steel Joist (RSJ) return rig, the dead man triangle was not visible and accumulation of ore was observed in the centre gully.
- The face winch had no code of signals displayed, the winch rope was worn out with loose wires and a loose nut was observed on the holding down bolts. The electrical terminal box was not secured and the dead man triangle was not visible.
- A winch was not locked and bell wires were not installed along the entire length of the scraper paths and not installed on both sides of the gullies.
- A winch was not locked and leaking grease; the signaling wire did not cover the entire length of the rope and the cable joint was close to the motor.
- No illumination and poor housekeeping around the winches were observed.
- A winch was found not locked out, drum guards were not sufficiently bolted on the winch, loose strands were observed on the winch rope and wires were used on winch handles instead of mine approved clips.
- There was no code of signals posted up at the winch cubby, the bulb to illuminate the winch was not working and had been reported by the winch operator for the past five days, loose strands on the winch rope were observed and wires were used on the winch handles instead of approved clips.

#### 3.3.1.6 Explosives (6%)

Some of the areas covered were as follows:

- The sinker had prepared primers at shaft bottom while drilling was not complete, against the mine charging procedure.
- 28 primers were already inserted into the shot holes and 29 primers were hung on the mesh wire around the shaft and not placed in an approved explosives lockable container or properly secured.
- The cortex was suspended with a piece of wire against the wire mesh; not placed in an approved explosives lockable container or properly secured.
- Loose boosters were found in a transparent plastic bag, suspended on a wire mesh, and not placed in an approved explosives lockable container or properly secured.
- Explosives control document was not corresponding to the items.

- 16 bags of 25kg each of explosives were found hidden/abandoned behind the ventilation curtain at the centre gully.
- An explosives charging unit was observed underground without a pre-use checklist which is part of the controls in the risk assessment.

### 3.4 Mine surveying

#### 3.4.1 Activities of the Directorate: Mine Surveying

The Directorate continues to monitor mine surveying standards and practices in order to promote a culture of safety and health at mines, gives guidance on the safe utilisation of undermined land for surface development purposes and renders mapping and draughting services. The Directorate also promotes the mine surveying profession by giving talks aimed at meeting of the Institute of Mine Surveyors of South Africa.

**Table 3.4.1: Completed tasks for the financial year as compared with the previous financial year**

Activities	Planned	Completed	Performance analysis
Mine surveying inspections (underground and surface mines)	214	335	The planned target was exceeded to improve on the health and safety at mines.
Underground inspections (control measurements)	184	211	The Learner Inspectors who were working under the supervision of a Senior Inspector started conducting inspections on their own thereby increasing the number of inspections completed.
	Received.	Completed.	
Permission and exemptions	125	125	All applications for permissions and exemptions for the financial year were completed.
Surface utilisation applications			
	Received.	Completed.	Performance analysis.
	222	222	All surface utilisation applications received during the financial year were completed.
Mine Surveyor's Certificate of Competency Examination (MSCC)			
	Number of MSCCs issued.	14	

#### 3.4.2 Surveying matters

The Directorate works closely with the regional office to maintain surveying and mapping standards, monitoring compliance by mines to the relevant Mine Health and Safety Regulations and administration of departmental copies of the statutory mine plans that the mines deposit at the regional offices. The Directorate regularly comments and makes recommendations regarding the safe utilisation of land for township development and processing applications for permissions and exemptions for the provision of the MHSA.

This Directorate also performs underground check measurements in restricted mining areas where surface structures require protection and checks measurements of underground workings to determine the accurate representation of plans of such workings. During underground visits, refuge bays are inspected to determine whether they comply with safety standards as set by the mine.

#### 3.4.3 Special surveys

The Directorate: Mine Surveying was involved in the following practical surveying projects:

- Assisting in boundary disputes.
- Verifying the accuracy of survey data and plans submitted by candidates undertaking the trial survey



projects as part of their MSCC examination.

- Assisting Principal Inspectors in ensuring that no mining operations are conducted within a horizontal distance of 100m from buildings/structures that require protection, unless a lesser distance has been determined safe by risk assessment.

#### 3.4.4 Section 55 instructions were issued on issues relating to the following:

- No appointed competent person for the mine.
- Mining within 100m from structures without permission.
- Inaccurate plans.
- No existing plans at the mine.
- Annual submission of plans not adhered to.

#### 3.4.5 Mapping services

The Sub-directorate: GIS and Mapping Service administers the archiving, retrieval and safekeeping of prescribed mine plans, departmental copies and survey records of mines that have closed down. It also serves clients who require information on the undermining status of land for township development and other purposes, as well as making available the mine plans of closed-down mines to mine owners or their representatives. The Sub-directorate is in the process of replacing hard copy topographical plans with electronic topographical plans, which will reduce the turnaround time for comments and recommendation on proposed township developments.

### 3.5 Training and examinations

#### 3.5.1 Implemented training

During the reporting period, the MHSI developed the skills and knowledge base of its staff as follows:

- A total of 84 MHSI officials attended technical and non-technical training courses plus conferences during the reporting period.
- Two managers attended and were found competent in the Advanced Management Development Programme (AMDP).

#### 3.5.2 Training interventions

##### 3.5.2.1 Assistant Inspector Programme

A total number of two; one male and one female, Assistant Inspectors recruited with Electrical/Mechanical Engineering tertiary qualifications were busy undergoing Inspector training at various regional offices of the Department at the commencement of the financial year. Both had not yet attained their GCC during the reporting period.

There were seven Assistant Inspectors who were added to the 35 from the initial 45 placed within regional offices during 2016/2017. This totalled 42 after three resignations during the 2016/2017 financial year.

Seven obtained their Bachelor of Technology qualifications which they had been pursuing at the University of Johannesburg.

Two Assistant Inspectors resigned during the course of the reporting period to pursue better financial prospects within the industry, reducing the number to 40.

All 40 were expected to register, attempt and pass the GCC in their respective disciplines during the course of Inspector training.

There were five of the 40 who had passed their respective GCC during the course of the financial year. This makes the total number in possession of GCC to be 17 and permanently employed by the Department. The Department is currently left with 23 Assistant Inspectors.

The only Assistant Inspector from the 45 who had been attempting Bachelor of Technology Degree obtained his qualification during the reporting period from the University of Johannesburg. He was, during the reporting period, placed within office of the Department to commence his Inspector training.

### 3.5.2.2 Bursary scheme

There were two bursary holders who pursued their academic studies at the beginning of the reporting period. One of them completed the qualification and the other is still finalising their qualification.

### 3.5.3 Examinations

**Table 3.5.3: Number of candidates and certificates issued per examination category**

TYPE OF CERTIFICATE	NUMBER OF CANDIDATES	CERTIFICATES ISSUED
Mine Engineer's (Electrical and Mechanical) Certificate	370	47
Mine Manager's Certificate	868	27
Mine Overseer's Certificate	1 069	76
Mine Surveyor's Certificate	559	12
Winding Engine Driver's Certificate	52	20
<b>Total</b>	<b>2 918</b>	<b>182</b>

# STATE OF HEALTH IN THE SOUTH AFRICAN MINING INDUSTRY



STATE OF HEALTH IN THE SOUTH AFRICAN MINING INDUSTRY

## 4. STATE OF HEALTH IN THE SOUTH AFRICAN MINING INDUSTRY

There is a steady increase in statutory reporting by the mines in both the year under review (2017) and the previous year (2016).

A slight reduction in all overexposures to occupational hygiene stressors was noted, with an exception of thermal heat, where there has been a sudden increase in overexposures as compared to the previous year. Airborne pollutant overexposure has reduced from 3.66% of the total 323 365 employees at risk in 2016 to 3.52% of the total of 345 465 employees at risk in 2017. Noise overexposures reduced from 0.87% of the total 333 430 employees at risk in 2016 to 0.22% of the total 348 420 employees at risk in 2017. Thermal heat overexposures increased by 2.81% of the total of 139 209 employees at risk in 2017 compared to 2.47% of the total of 270 278 employees at risk in 2016. An overall reduction in overexposures to occupational hygiene stressors has been noted. Cold continues to maintain zero overexposure year on year since 2013.

A continued improvement has been noted with the submission of Annual Medical Reports (AMRs) by operating mines. During 2017, 975 AMRs were submitted, which is an increase of 8% when compared to 902 reports submitted during the previous reporting year.

The total number of employees covered in AMRs has shown a slight decrease of 4%, from a total of 541 519 in 2016 to 521 358 in 2017. The initial medical examinations decreased by 4%, whilst periodic and exit medical examinations have increased by 7% and 8% respectively when compared to the previous year.

There has been a 3% decrease on the total number of occupational diseases reported nationally when compared to the previous year. The occupational diseases reported from gold mines have decreased by 8%, coal decreased by 11%, diamond decreased by 58%, copper decreased by 57%, chrome decreased by 23%, manganese decreased by 39% and iron ore decreased by 94%.

The occupational diseases reported from platinum and all other mines have increased by 18% and 8% respectively when compared to the previous year

### 4.1 Occupational hygiene

Section 9.2.7 of the MHS Act requires mines to submit statutory reports on personal exposure monitoring to occupational hygiene stressors. Compliance in occupational hygiene statutory returns has improved. The overall number of reports submitted increased as follows: airborne pollutants by 3%; noise by 9%; thermal stress heat by 5% and thermal stress cold by 15%. The analysis of occupational hygiene measurements is based on the reports submitted to the MHSI as indicated in table 4.1(a) below:

**TABLE 4.1(a): Compliance reporting**

REGION	AIRBORNE		NOISE		HEAT		COLD STRESS	
	2016	2017	2016	2017	2016	2017	2016	2017
Western Cape	83	82	67	69	29	76	29	33
Northern Cape	89	99	85	100	51	84	51	79
Free State	61	48	49	46	23	33	23	21
Eastern Cape	32	32	32	32	21	27	21	27
KwaZulu-Natal	71	61	69	60	39	50	39	50
Mpumalanga	116	133	110	123	64	86	64	80
Limpopo	57	60	54	59	31	46	31	34
Gauteng	114	119	97	120	73	99	73	61

REGION	AIRBORNE		NOISE		HEAT		COLD STRESS	
	2016	2017	2016	2017	2016	2017	2016	2017
North West: Klerksdorp	126	127	88	87	78	80	78	82
North West: Rustenburg	114	132	114	141	63	102	63	89
<b>TOTAL</b>	<b>863</b>	<b>893</b>	<b>757</b>	<b>837</b>	<b>472</b>	<b>683</b>	<b>472</b>	<b>556</b>

#### 4.1.1 Airborne pollutant exposures

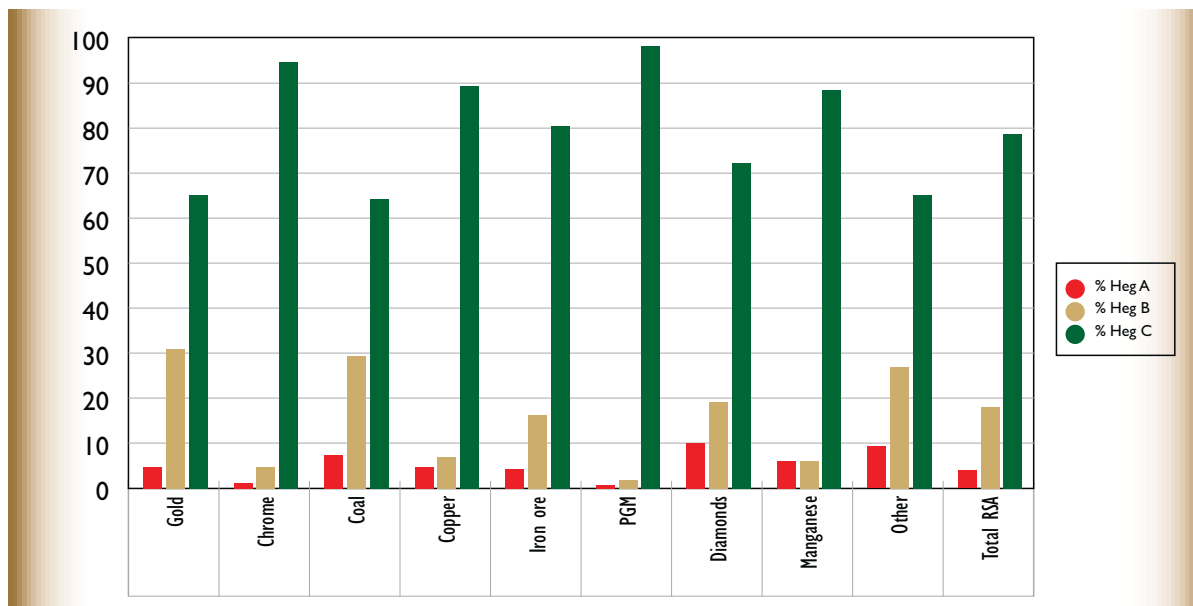
##### Note:

The exposure classifications are based on the air quality index (AQI) due to exposure to multiple pollutants in the mining environment.

The AQI of multiple pollutants is determined by dividing the dust concentration of each pollutant in the mixture by its Occupational Exposure Limit (OEL) and adding the results. The sum should not be greater than a unit.

The percentage of exposures depicted in the graph below represents the percentage of exposures within a homogeneous group from which samples were collected and does not reflect the total percentage of exposed employees in the mining industry.

**FIGURE 4.1.1(a): Percentage exposure to airborne pollutants per classification band per commodity in 2017**



##### Exposure classification bands

A = Exposures  $\geq$  the OEL or mixture of exposures  $\geq 1$

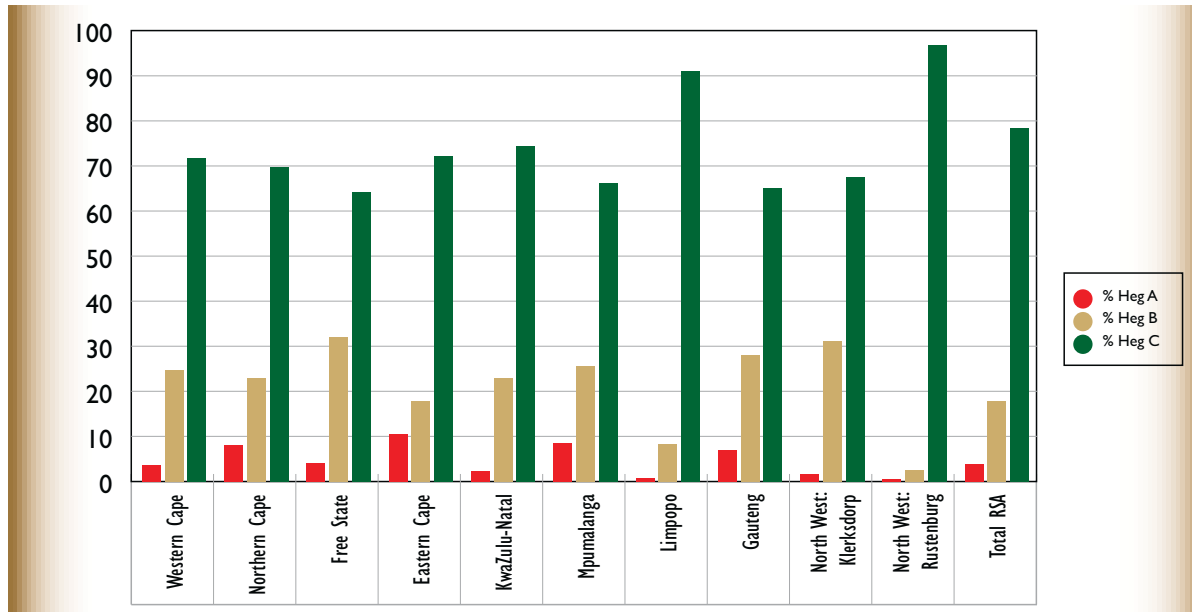
B = 50% of the OEL  $\leq$  exposures  $<$  OEL or  $0.5 \leq$  mixtures of exposures  $< 1$

C = 10% of the OEL  $\leq$  exposures  $<$  50% of the OEL or  $0.1 \leq$  mixtures of exposures  $< 0.5$

An overall slight decrease is noted in exposures above the OEL from 3.66 % in 2016 to 3.52 % in 2017 and 17.79% in 2016 to 17.41% in 2017 in the B classification band. This is due to contributions from the following commodities: gold (4 % in 2016 to 3.84 % in 2017); chrome (0.88% in 2016 to 0.21% in 2017); coal (6.99% in 2016 to 6.28% in 2017); copper (4.05% in 2016 and 2.88% in 2017); diamonds (9.36% in 2016 to 6.22% in 2017) and other mines (8.82% in 2016 to 7.63% in 2017). There has been an increase in overexposure in the following commodities: manganese (5.79 % in 2016 to 11.05 % in 2017); iron ore (3.76 % in 2016 to 4.88%

in 2017); PGM (0.17 % in 2016 to 0.68% in 2017). The increase in overexposures, among others, is mainly due to deterioration and poor maintenance of control measures that are put in place. More joint effort is continuously required to ensure achievement and maintenance of zero exposures above the OEL, with special focus to iron ore, PGM and manganese mines.

**FIGURE 4.1.1(b): Percentage exposure to airborne pollutants per classification band per region in 2017**



**Exposure classification bands**

- A = Exposures  $\geq$  the OEL or mixture of exposures  $\geq 1$
- B = 50% of the OEL  $\leq$  exposures  $<$  OEL or  $0.5 \leq$  mixtures of exposures  $< 1$
- C = 10% of the OEL  $\leq$  exposures  $<$  50% of the OEL or  $0.1 \leq$  mixtures of exposures  $< 0.5$

A significant improvement was noted in Gauteng (7.22% in 2016 to 2.06% in 2017) and Mpumalanga (8.43% in 2016 to 5.89% in 2017). Regrettably, there was an increase in the Western Cape, Limpopo, Free State, Eastern Cape, North West: Rustenburg, North West: Klerksdorp and KwaZulu-Natal regions; this could be attributed to failure of controls being put in place, inadequate monitoring and supervision.

**4.1.2 Noise exposure**

**Note:**

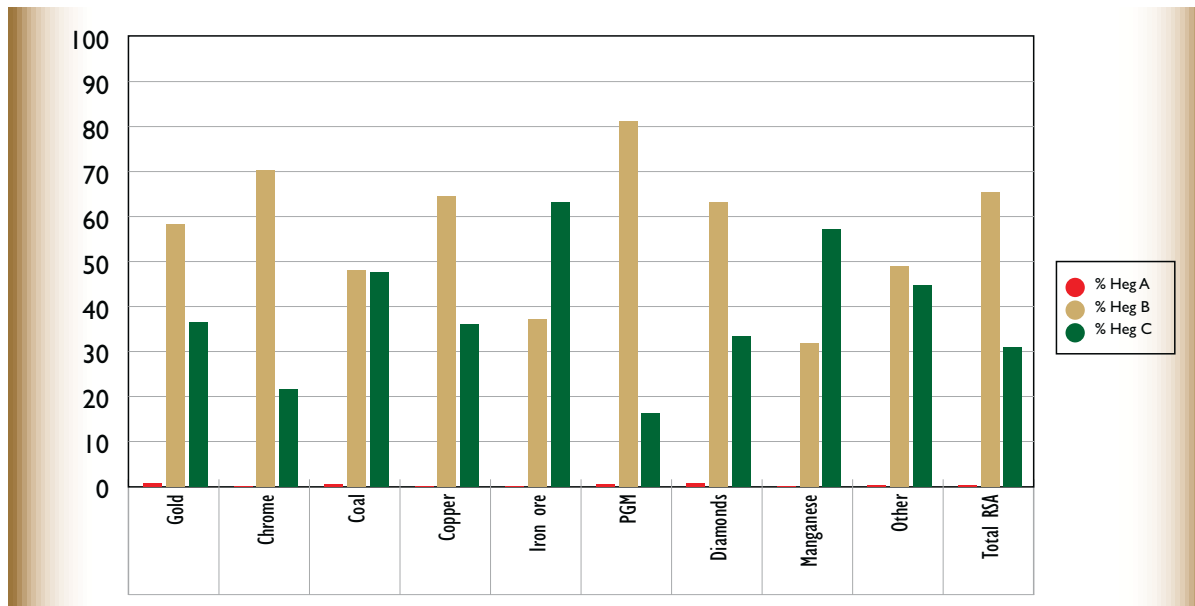
The OEL for noise is 85 dB (A) based on an eight-hour exposure shift.

No special precautions except monitoring are required for the C-band.

The implementation of the hearing conservation programme is required for the A- and B-bands.

Persons in the A- and B-bands are overexposed.

**FIGURE 4.1.2(a): Percentage exposure to noise per exposure classification band per commodity in 2017**



Exposure classification band:

A = Exposures  $\geq$  105 dB LAeq, 8h

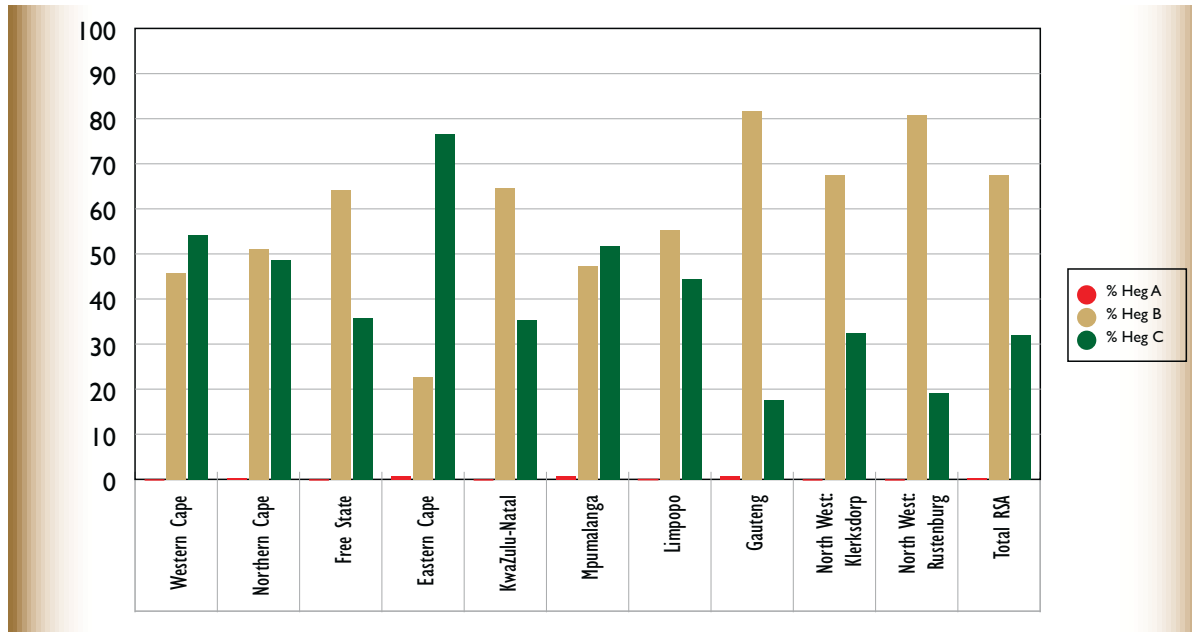
B = 85 dB LAeq, 8h  $\leq$  exposures < 105 dB LAeq, 8h

C = 82 dB LAeq, 8h  $\leq$  exposures < 85 dB LAeq, 8h

Overexposure to noise has decreased from 0.87 % in 2016 to 0.22 % in 2017 in the Homogeneous Exposure Group (HEG) A-classification band; and from 67.49 % in 2016 to 64.95 % in 2017 in HEG B-classification band. A slight increase, which could be due to a deterioration of control measures from 67.51 % in 2016 to 67.62 % in 2017 in HEG B-classification band, is noted.

The gold, chrome, PGM, manganese and other mines commodities have reduced their overexposures; with copper and iron ore continuing with zero exposures in the past three years. A slight increase has been noted in coal from 0.28% in 2016 to 0.35% in 2017 and diamonds from 0% in 2016 to 0.84% in 2017 in the A-classification band. There is a need to reduce exposures above occupational exposure limit (B-classification) 85 d(B) with more focus on attenuating noise at source and more emphasis on the “buy quiet and maintain” policy by mining houses.

**FIGURE: 4.1.2(b): Percentage exposure to noise per exposure classification band per region in 2017**



Exposure classification band:

A = Exposures  $\geq$  105 dB LAeq, 8h

B = 85 dB LAeq, 8h  $\leq$  exposures < 105 dB LAeq, 8h

C = 82 dB LAeq, 8h  $\leq$  exposures < 85 dB LAeq, 8h

The following regions have reduced exposures in the A-classification band: KwaZulu-Natal, North West: Rustenburg, Mpumalanga and Eastern Cape. North West: Klerksdorp and Free State have maintained zero exposures in the A-band year-on-year. Despite an overall reduction, the Northern Cape region has increased overexposures in A-band from 0.05% in 2016 to 0.39% in 2017.

### 4.1.3 Thermal stress

Monitoring is conducted on an annual cycle period in compliance with Regulation 9.2 (7) of the MHSA, as amended. Accurate and meaningful results are to be representative of all full working shifts for that thermal environment, as obtained from this monitoring.

The employer must ensure that, in defining any particular thermal environment, the precautions listed below are heeded:

- Care should be exercised to detect trends where the thermal environment changes, especially from 'cool' to 'hot', or from 'hot' to 'abnormally hot'. This is clearly indicated by regular monitoring, even if only on a random basis and 'cool' environments should not be excluded especially when marginal. The specific protocol would be dictated by prevailing circumstances, and, therefore, cannot be stipulated or prescribed.
- Seasonal drifts could be crucial and relying on winter temperatures may lead to an underestimation of the risk and vice versa. Environmental monitoring should take this into account.

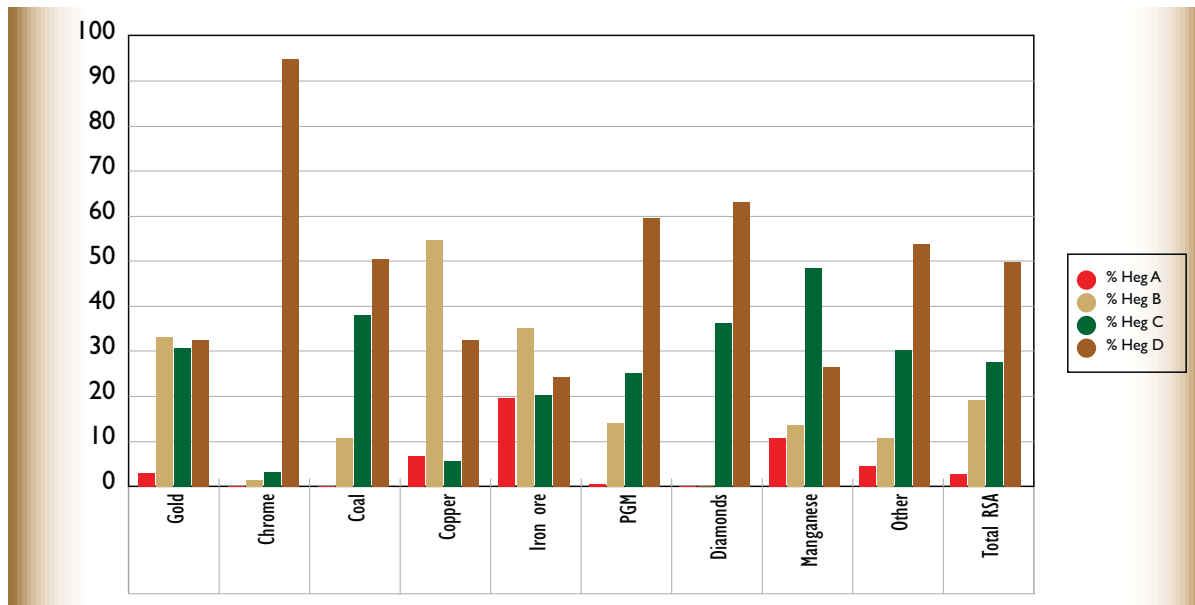


#### 4.1.3.1 Heat stress

**Note:**

For the purpose of defining the thermal environment, from a heat stress management point of view, dry- and wet-bulb, globe temperatures, whirling hygrometers or any other suitable instrumentation may be used. This information may be extracted from existing databases that are continually updated. Regular monitoring, even on daily basis, is recommended under certain circumstances.

**FIGURE: 4.1.3.1(a): Percentage exposure to thermal stress/heat per classification band per commodity in 2017**

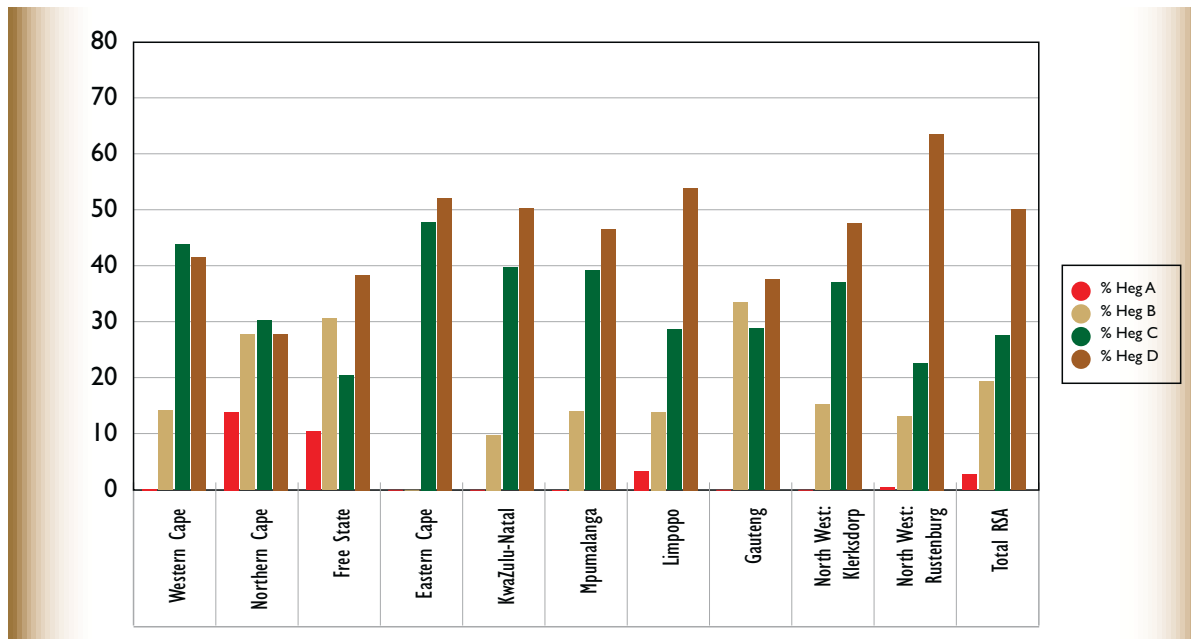


Heat stress exposure classification band:

- A = WB > 32.5 °C or DB > 37 °C or globe temperature > 37 °C
- B = 29.0 °C < WB ≤ 32.5 °C and DB ≤ 37 °C globe temperature as for dry bulb
- C = 27.5 °C < WB ≤ 29.0 °C and DB ≤ 37 °C globe temperature as for dry bulb
- D = WB ≤ 27.5 °C and DB ≤ 32.5 °C globe temperature: as for dry bulb

An overall slight increase in exposures above the OEL is noted in the A-classification band from 2.47% in 2016 to 2.81% in 2017. This is as a result of an increase of exposure in iron ore from 6.02% in 2016 to 19.77% in 2017; and gold mines from 0.01% in 2016 to 3.11% in 2017. Besides the overall increase seen above, the coal, copper, PGM, diamond and manganese commodities reduced overexposure to heat; with chrome maintaining zero exposures in the last two years. These increases are due to climate change affecting environmental condition on surface operations; and in deep underground mines these are due to inadequate air cooling strategies, poor maintenance and failure of controls being put in place to reduce heat in the working places.

**FIGURE: 4.1.3.1(b): Percentage exposure to thermal stress/heat per classification band per region in 2017**



Heat stress exposure classification band:

A = WB > 32.5 °C or DB > 37 °C or globe temperature > 37 °C

B = 29.0 °C < WB ≤ 32.5 °C and DB ≤ 37 °C globe temperature as for dry bulb

C = 27.5 °C < WB ≤ 29.0 °C and DB ≤ 37 °C globe temperature as for dry bulb

D = WB ≤ 27.5 °C and DB ≤ 32.5 °C globe temperatures: as for dry bulb

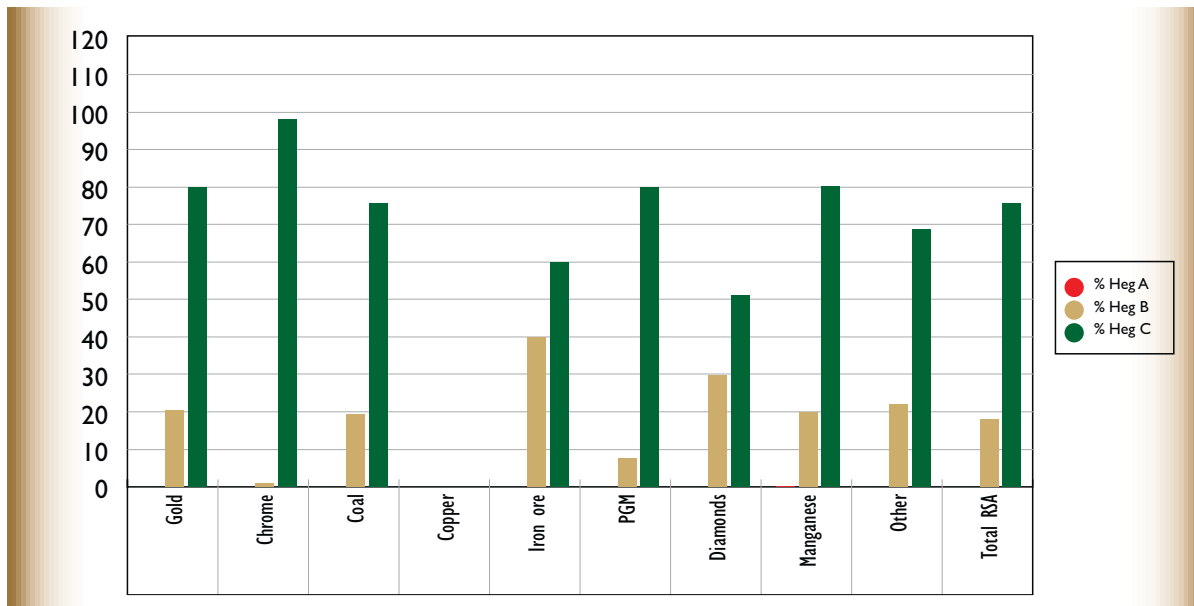
Some Regions have a noticeable increase in overexposures above the OEL in the A classification– band with Northern Cape increasing from 7.16 % in 2016 to 14.02% in 2017; Free State from 0.92% in 2016 to 10.49% in 2017; Mpumalanga moved from zero exposures to 0.08% 2017; Limpopo from 0.01% in 2016 to 3.41% in 2017. Whereas Western Cape, Eastern Cape, KwaZulu-Natal, Gauteng, North West (Rustenburg) reduced heat overexposures with North West (Klerksdorp) maintaining zero exposures for three successive years.

#### 4.1.3.2 Cold stress

**Note:**

- Temperature ranges are given in terms of equivalent chill temperature.
- Cold stress management (CSM).
- Thermal monitoring for cold stress should be conducted during the coldest quarter (June to August), as determined by risk assessment.
- For defining the thermal environment from a CSM point of view, dry-bulb temperatures and velocity, using any suitable instrumentation, may be used. This information may be extracted from existing databases that are continually updated. Regular monitoring, even on a daily basis, is recommended under certain circumstances.

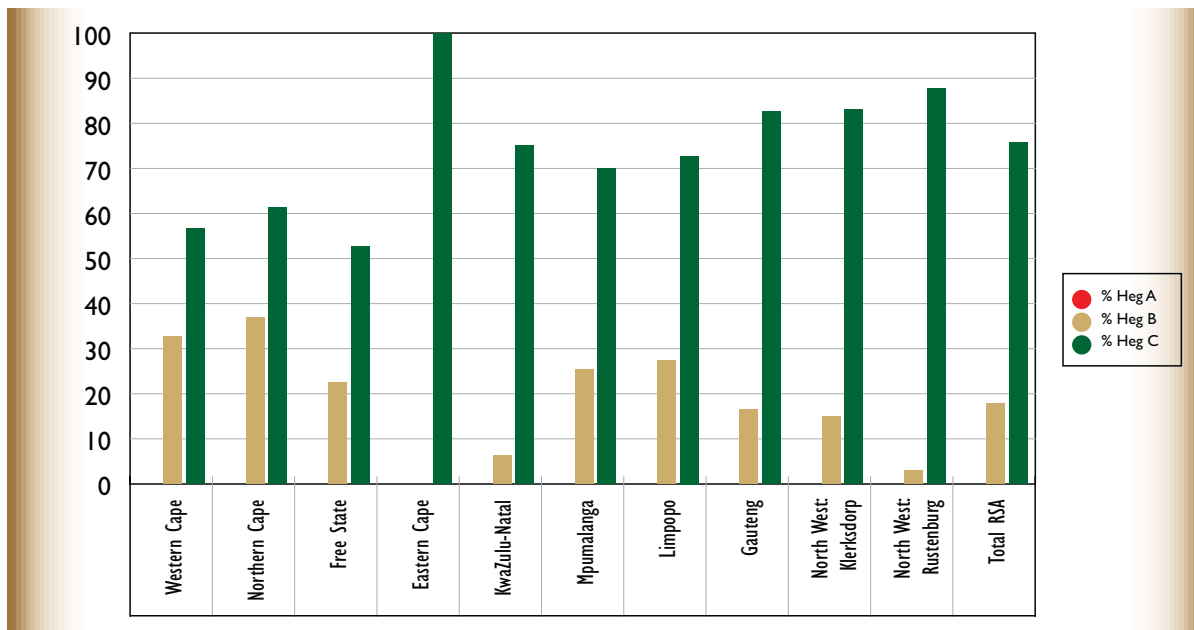
**FIGURE: 4.1.3.2(a): Percentage exposure to thermal stress/cold per exposure classification band per commodity in 2017**



Cold stress exposure classification band:  
 A = Temperature  $\geq -30.0$  °C  
 B =  $5.0$  °C  $\leq$  Temperature  $< -30.0$  °C  
 C = Temperature  $> 5.0$  °C

There is an overall zero exposures above the OEL which has been maintained year-on-year since 2013. The industry has continuously managed to curb cold exposures above the OEL. Strategies and more effort should be put in place to reduce further exposure in the B-classification band.

**FIGURE: 4.1.3.2(b): Percentage exposure to thermal stress/cold per exposure classification band per region in 2017**



Cold stress exposure classification band:  
 A = Temperature  $\geq -30.0$  °C  
 B =  $5.0$  °C  $\leq$  Temperature  $< -30.0$  °C  
 C = Temperature  $> 5.0$  °C

Cold stress in all regions has been maintained below the OEL. The workers' exposure to cold have decreased by 67.83% in the year under review as compared to the previous year. The significant decreases were 45.2%, 28.1% and 9.9% in Free State, North West: Klerksdorp and North West: Rustenburg respectively.

#### 4.1.4 General

There has been a steady increase in statutory reporting by the mines in both the year under review and the previous year.

A slight reduction in all overexposures to occupational hygiene stressors has been noted, with an exception of thermal heat where there has been a sudden increase in overexposures compared to the two previous years' reviews. Adherence to heat stress management is critical.

Regions that have mines which have reduced worker exposures are commended. This improvement is attributed to ongoing engagements with the mines, as well as focussed inspections and audits of prioritised mines, workshops through regional tripartite forums. Occupational health-focused working groups where challenges are addressed, including the sharing of best practices at forums such as the Occupational Health Dialogue.

The efforts at tripartite engagements and working together as a collective have also contributed to the reduction of overexposure over the years. Challenges remain where workers are still overexposed to hazards. Airborne pollutants hazards remain one of the major threats, as it was evident during inspections and audits with regards to the implementation of the CIOM guideline on airborne pollutants. As a result, the guideline has been reviewed and promulgated. Workshops have been held in some regions and will continue to cover all regions to assist the industry to have a common understanding, of a health programme that will assist in ensuring that proper controls are put in place to reduce and eventually eliminate exposures above the OEL.

With regards to noise, hand held drills are still the major contributors to overexposures and multi-stakeholder efforts, including ongoing consultation with original equipment manufacturers, is crucial to ensure attenuation of these equipment to reduce worker exposures. More emphasis should be on the buy quiet policy to be implemented by the employers and sharing of best practices.

## 4.2 Occupational Medicine

Section 16 of the MHSA, as amended requires every occupational medical practitioner (OMP) at a mine to compile an Annual Medical Report (AMR) and to give an analysis of occupational health based on the employees' results of medical surveillance conducted during the calendar year.

### 4.2.1 Annual Medical Reports (AMRs)

#### 4.2.1.1 AMRs received per region

The MHSA requires the employer to deliver to the Medical Inspector a copy of the AMR before the end of February each year as per the Chief Inspector of Mine's Instruction. The AMRs submitted by operating mines have shown an increase of 8%, from a total of 902 in 2016 to 975 in 2017. The total of AMRs submitted from KwaZulu-Natal and Western Cape regions have remained unchanged whilst AMRs from the other eight regions have increased when compared to the previous year (2016).

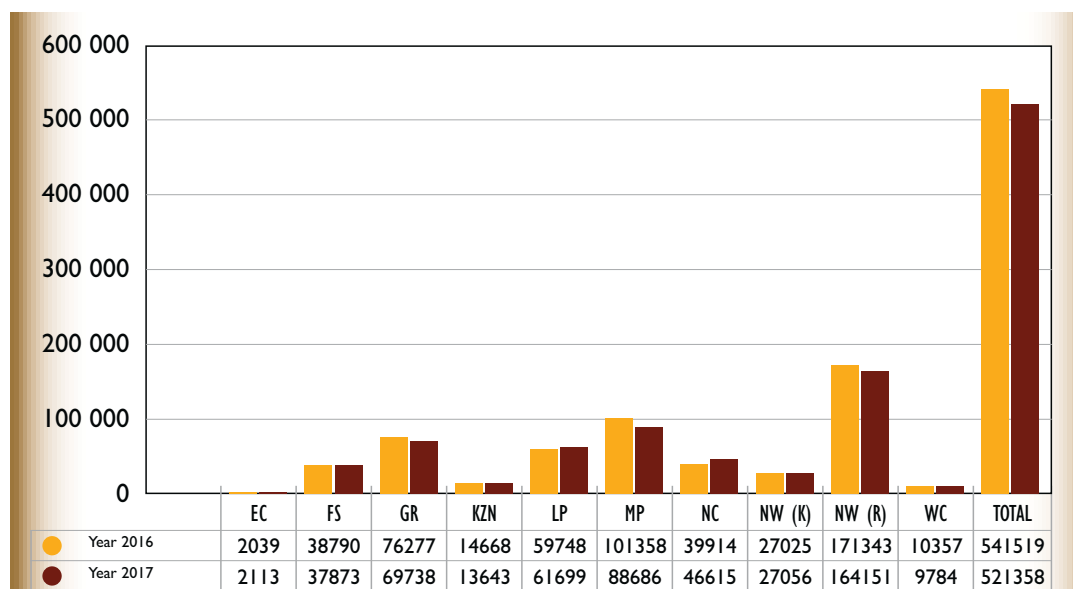
Table 4.2.1 (a): AMRs per region and by commodity: 2016 and 2017

	Chrome		Copper		Coal		Diamond		Gold		Iron Ore		Manganese		Platinum		All Other		TOTAL		Percentage change
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	
EC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	67	64	67	5%
FS	0	0	0	0	2	2	4	5	20	20	0	0	0	0	0	0	22	23	48	50	4%
GR	0	0	0	0	0	0	1	1	21	21	0	0	0	0	0	0	73	81	95	103	8%
KZN	0	0	0	0	12	11	0	0	0	0	0	0	0	0	0	0	48	49	60	60	0%
LP	14	17	1	1	4	4	2	3	1	1	1	1	0	0	12	13	45	48	80	88	10%
MPU	0	0	0	0	109	115	0	0	6	4	0	0	1	1	2	2	27	27	145	149	3%
NC	0	0	0	0	0	0	51	65	0	0	6	7	14	16	0	0	18	24	89	112	26%
NW K	0	0	0	0	0	0	79	101	10	9	0	0	2	1	0	0	29	30	120	141	18%
NW R	21	24	0	0	0	0	1	1	0	0	1	2	0	0	65	66	23	22	111	115	4%
WC	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	89	89	90	90	0%	
	35	41	1	1	127	132	139	177	58	55	8	10	17	18	79	81	438	460	902	975	8%

#### 4.2.1.2 Total employees covered in AMRs

The total employees covered in AMRs have decreased by 4%, from a total of 541 519 in 2016 to 521 358 in 2017. There has been a notable increase in the Northern Cape, followed by a slight increase in the Eastern Cape and Limpopo regions. The other seven regions have shown a decrease on the total employees reported when compared to the previous year.

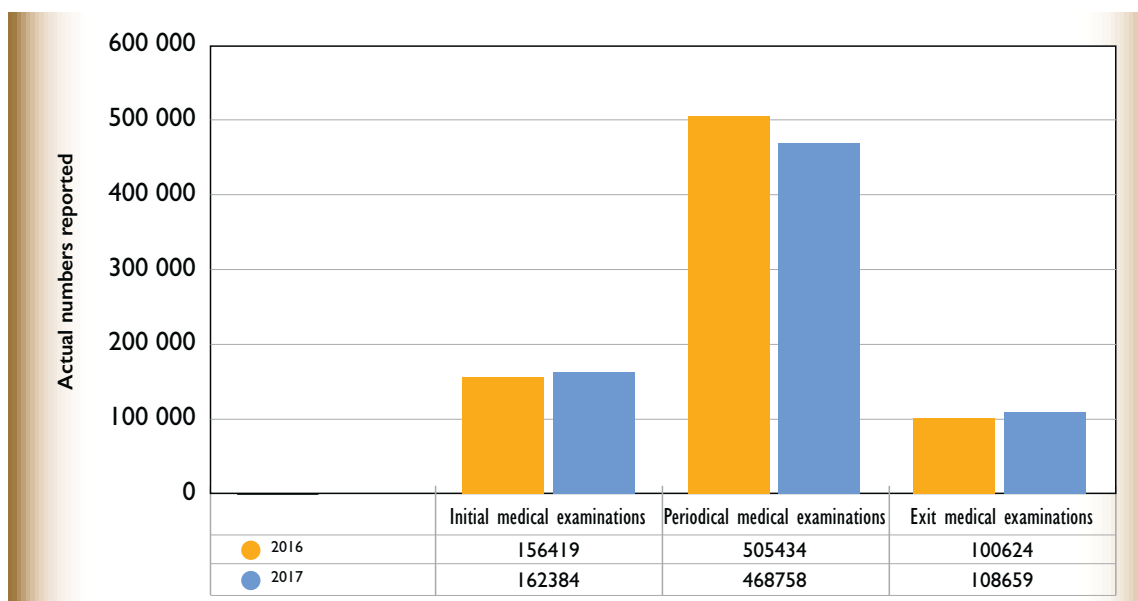
Graph: 4.2.1.2(a): Total employees reported from AMRs per region: 2016 and 2017



#### 4.2.1.3 Medical surveillance conducted

The employer is obligated to establish and maintain a system of medical surveillance of employees exposed to health hazards (Section 13, MHS). The medical surveillance system must consist of initial medical examinations and periodic and exit medical examinations at appropriate intervals. The initial examinations reported on AMRs during 2017 have increased by 4%, periodic medical examinations decreased by 7% and exit medical examinations increased by 8% when compared to the previous year.

Graph: 4.2.1.3 (a): Medical surveillance reported: 2016 and 2017



## 4.2.2 Occupational diseases reported on the AMRs

There has been a decrease of 3% on the total number of occupational diseases reported, from a total of 4 632 cases reported in 2016 to 4 483 cases reported in 2017, despite an increase in the number of AMRs submitted.

### 4.2.2.1 Analysis of medical surveillance trends

#### 4.2.2.1.1 Occupational disease trends by region

An increase has been noted in occupational diseases reported from North West: Rustenburg followed by Limpopo and KwaZulu-Natal. There has been a decrease on occupational diseases reported from the other six regions and the Eastern Cape region reported one case, whilst no cases were reported during the previous year (2016).

Table: 4.2.2.1.1: Occupational diseases reported from AMRs per region: 2016 and 2017

Region	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	Percentage change
	Sil		PTB		Sil + TB		NIHL		CWP		Asb		Other occ diseases		Total		
EC	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	100%
FS	311	292	502	383	19	19	118	131	0	1	0	1	71	38	1021	865	-15%
GR	112	111	735	662	2	7	184	215	0	0	0	1	54	57	1087	1053	-3%
KZN	2	2	21	16	0	0	5	5	0	1	0	0	0	15	28	39	39%
LP	1	48	75	45	0	9	87	126	1	3	8	8	7	8	179	247	38%
MP	30	43	254	227	5	5	139	86	57	61	2	2	53	38	540	462	-14%
NC	0	0	56	30	4	0	29	5	0	0	5	0	14	0	108	35	-68%
NW (K)	103	73	156	131	8	12	37	65	0	0	0	0	113	133	417	414	-1%
NW (R)	73	82	769	752	0	0	355	503	0	0	2	0	25	24	1224	1361	11%
WC	3	0	12	1	0	0	12	5	0	0	0	0	1	0	28	6	-79%
<b>TOTAL</b>	<b>635</b>	<b>652</b>	<b>2580</b>	<b>2247</b>	<b>38</b>	<b>52</b>	<b>966</b>	<b>1141</b>	<b>58</b>	<b>66</b>	<b>17</b>	<b>12</b>	<b>338</b>	<b>313</b>	<b>4632</b>	<b>4483</b>	<b>-3%</b>

## Occupational diseases per commodity

An overall decrease of 3% on the total number of occupational diseases reported is significant, considering an 8% increase on submitted AMRs. The gold mines reported more occupational diseases followed by platinum, coal, all other mines, chrome, diamond, manganese, copper and iron ore mines.

**Table: 4.2.2.1.2(a): Occupational diseases reported from AMRs per commodity: 2016 and 2017**

	Sil		PTB		Sil +TB		NIHL		CWP		Asb		Other occ diseases		Total		Percentage change
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	
Gold	543	506	1436	1190	30	43	332	390	0	0	0	2	231	229	2572	2360	-8%
Platinum	68	121	778	741	0	9	347	535	0	0	1	8	24	26	1218	1440	18%
Coal	3	2	182	186	4	0	119	85	58	66	1	2	53	34	420	375	-11%
Diamond	3	0	34	18	0	0	30	13	0	0	0	0	7	0	74	31	-58%
Copper	0	0	2	0	0	0	5	3	0	0	0	0	0	0	7	3	-57%
Chrome	3	3	60	46	0	0	72	61	0	0	8	0	6	5	149	115	-23%
Manganese	0	0	20	17	0	0	7	2	0	0	1	0	3	0	31	19	-39%
Iron Ore	0	0	8	2	4	0	9	0	0	0	4	0	8	0	33	2	-94%
All Other	15	20	60	47	0	0	45	52	0	0	2	0	6	19	128	138	8%
<b>TOTAL</b>	<b>635</b>	<b>652</b>	<b>2580</b>	<b>2247</b>	<b>38</b>	<b>52</b>	<b>966</b>	<b>1141</b>	<b>58</b>	<b>66</b>	<b>17</b>	<b>12</b>	<b>338</b>	<b>313</b>	<b>4632</b>	<b>4483</b>	<b>-3%</b>

### Gold mines

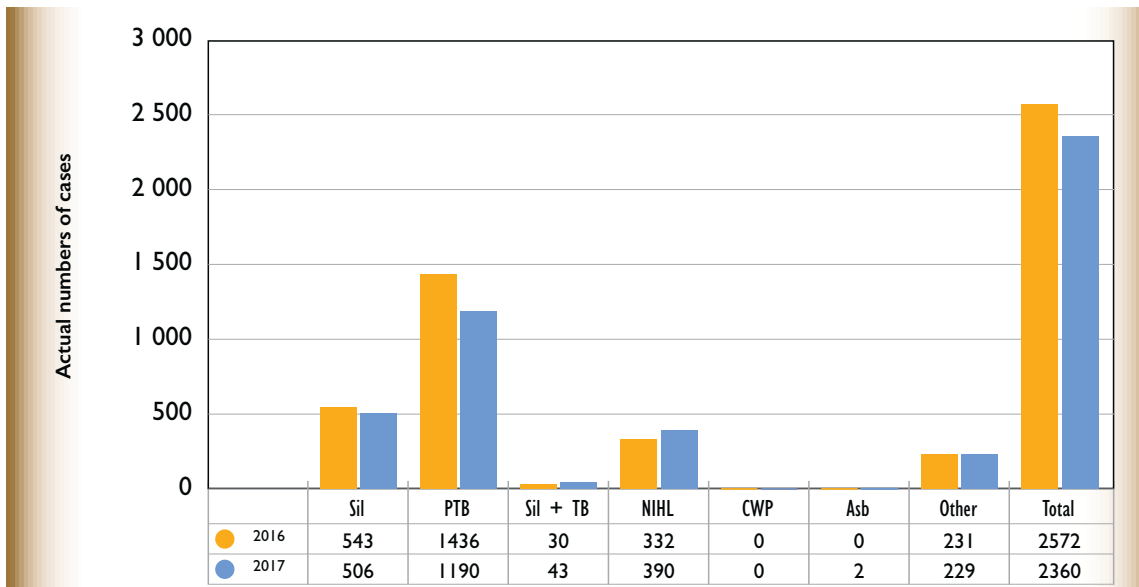
Occupational diseases reported have decreased by 8%. Silicosis cases showed a decrease of 7%, pulmonary tuberculosis (PTB) has decreased by 17%, whilst silico-tuberculosis (Sil+TB) cases have increased by 43% and noise-induced hearing loss (NIHL) increased by 17% when compared to the previous year.

A reported increase in NIHL and silicosis is attributed to the ageing workforce and a long lag period before an exposed worker develops an occupational disease. The incidence of PTB cases has shown a slight decrease due to the efficient vigilance on TB surveillance and management programmes, coupled with promotion of prevention initiatives like proactive contact tracing of all identified groups, continuous campaigns and health education at all points of contact for employees with health care workers, as well as the TB prophylactic treatment provided to all susceptible individuals such as those who are immune-compromised and those with diagnosed silicosis. The development and implementation of Guidance Notes on management of TB and people living with HIV have greatly contributed to the reduction achieved. Previous TB infection has been reported as a contributing factor to workers developing secondary chronic obstructive airways disease (COAD); however, with improved dust control measures, the PTB incidence is likely to reduce at mines. Cigarette smoking is reportedly a confounding factor in the slight increase noted on the COAD incidence and another factor in high incidence could be due to high PTB incidence in 2016.

A slight decrease has been noted on active PTB cases and more work such as education campaigns, maintaining good compliance with contact tracing efforts and reducing HIV incidence will further reduce TB incidence.

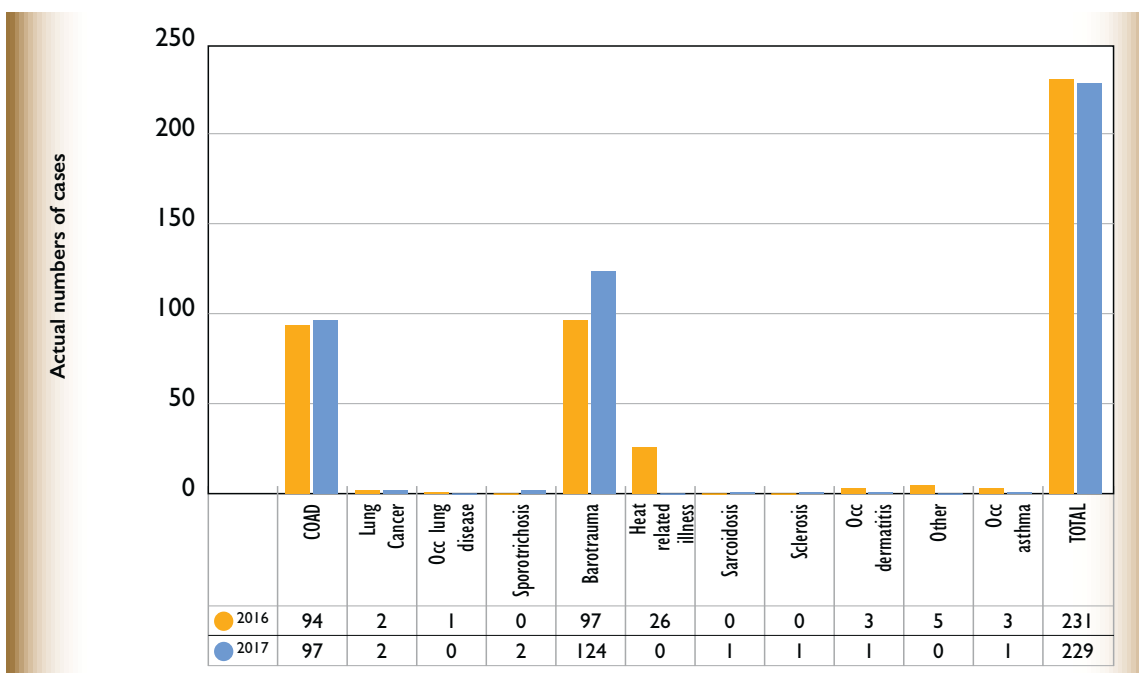
Exposure to noise over a long period has contributed to the current increase. Hearing conservation programmes are to be carried out by the mines' multi-disciplinary teams, to improve hygiene measures as well as engineering and administration controls. Employees are using customized hearing protection devices (HPDs) and they receive continued intensive education and coaching which is expected to reduce the incidence of NIHL in the future.

Graph: 4.2.2.1.2(b): Occupational diseases reported from gold mines' AMRs: 2016 and 2017



Graph: 4.2.2.1.2(c): Other occupational diseases reported from gold mines' AMRs: 2016 and 2017

Other occupational diseases reported have decreased by 1% when compared to the previous year.



### Platinum mines

There has been an increase of 18% on the occupational diseases reported. Silicosis cases have increased by 78%, NIHL increased by 54%, whilst the PTB cases have decreased by 5% when compared to the previous year.

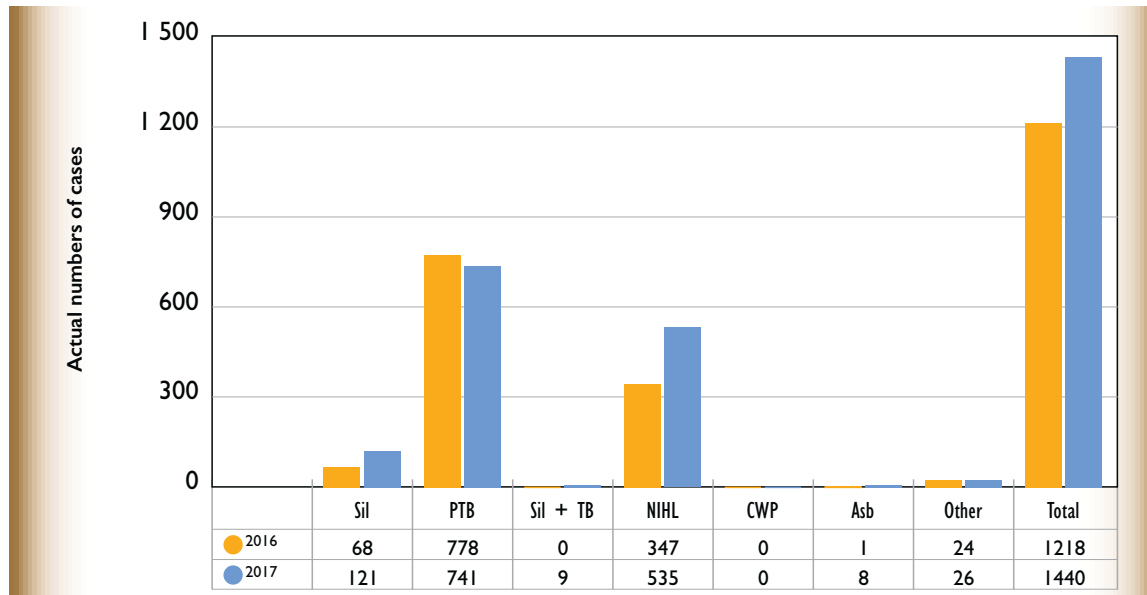
Exposure to noise remains an occupational risk at mining operations and NIHL incidence has increased due to the ageing workforce. Mines continue to ensure implementation of effective hearing conservation programmes.



An increase in silicosis incidence is attributed to employees' history of working on gold mines. PTB has decreased slightly due to increased awareness, implementation of Isoniazid (INH) prophylaxis, robust TB contact tracing and counselling programmes to assist employees and families. TB is an opportunistic infection that also develops amongst immuno-compromised employees.

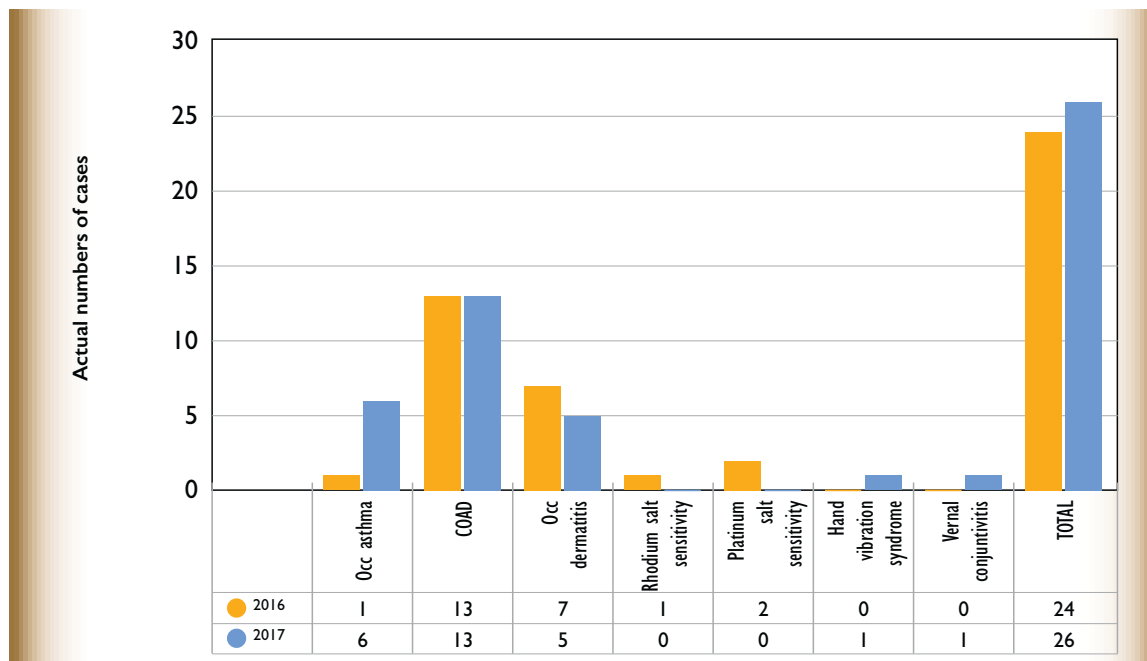
There has been a decrease in occupational dermatitis incidence which can be attributed to occupational health risk management and awareness campaigns.

**Graph: 4.2.2.1.2(d): Occupational diseases reported from platinum mines' AMRs: 2016 and 2017**



**Graph: 4.2.2.1.2(e): Other occupational diseases reported from platinum mines' AMRs: 2016 and 2017**

The other occupational diseases showed an increase of 8% when compared to the previous year.



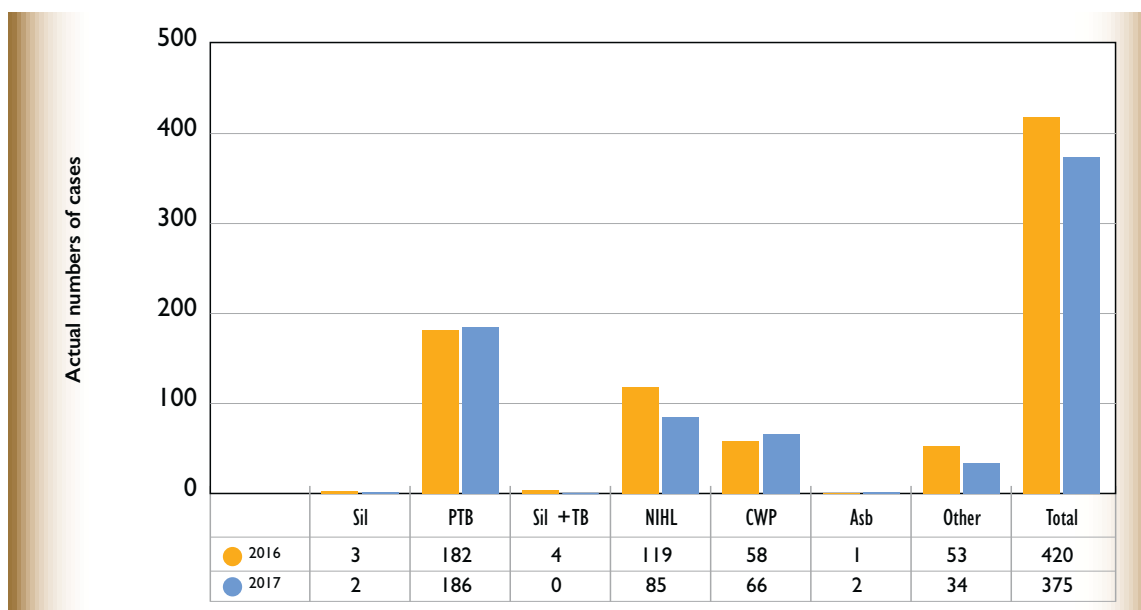
## Coal mines

The occupational diseases reported have shown a decrease of 11% when compared to the previous year. Silicosis has decreased by 3%, PTB has increased 2%, NIHL has decreased by 29%, whilst Coal Workers Pneumoconiosis (CWP) has increased by 14%. Two asbestosis cases were reported compared to one case reported in 2016, and no Sil+TB was reported whilst four cases were reported in 2016.

Intensive educational and screening programmes have been implemented to ensure early detection of occupational diseases. The reduction in the number of PTB incidence is attributed to a robust implementation of TB prevention strategies.

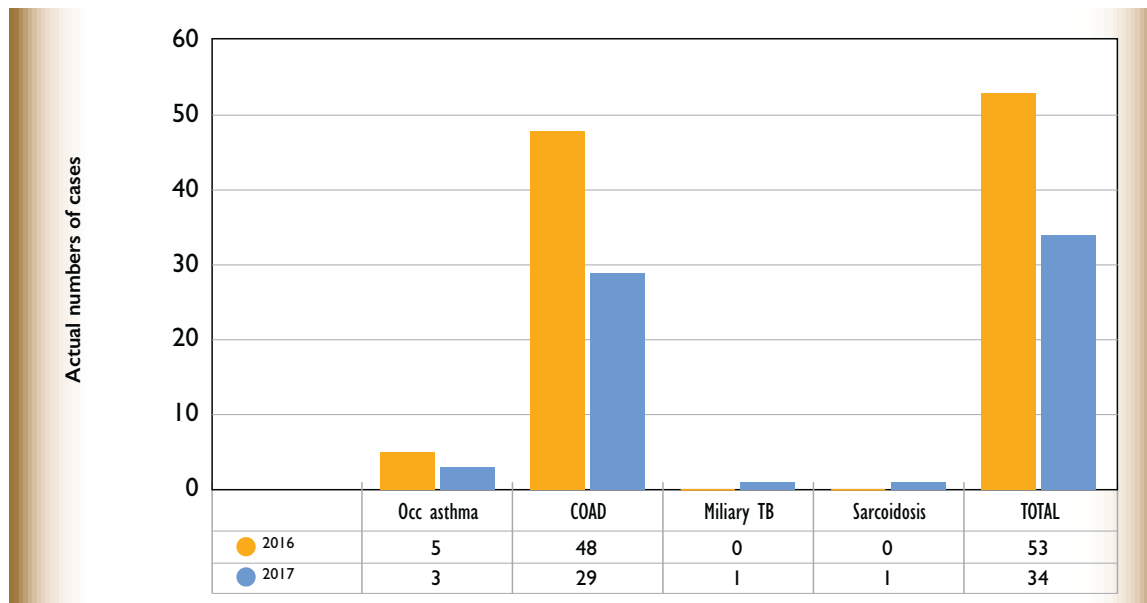
There has been no significant increase in the number of NIHL cases due to early referral and employees working in noise zones are fitted with customised hearing protection devices (HPDs) to provide further attenuation of noise exposure levels.

**Graph: 4.2.2.1.2(f): Occupational diseases reported from coal mines' AMRs: 2016 and 2017**



**Graph: 4.2.2.1.2(g): Other occupational diseases reported from coal mines' AMRs: 2016 and 2017**

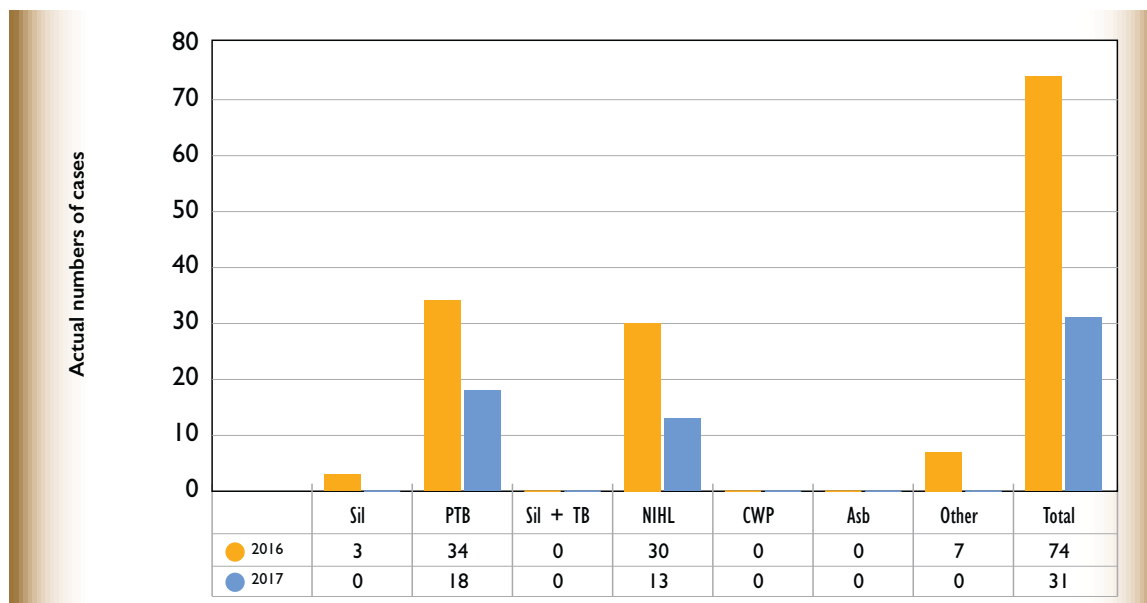
Other occupational diseases reported showed a decrease of 36% when compared to the previous year.



### Diamond mines

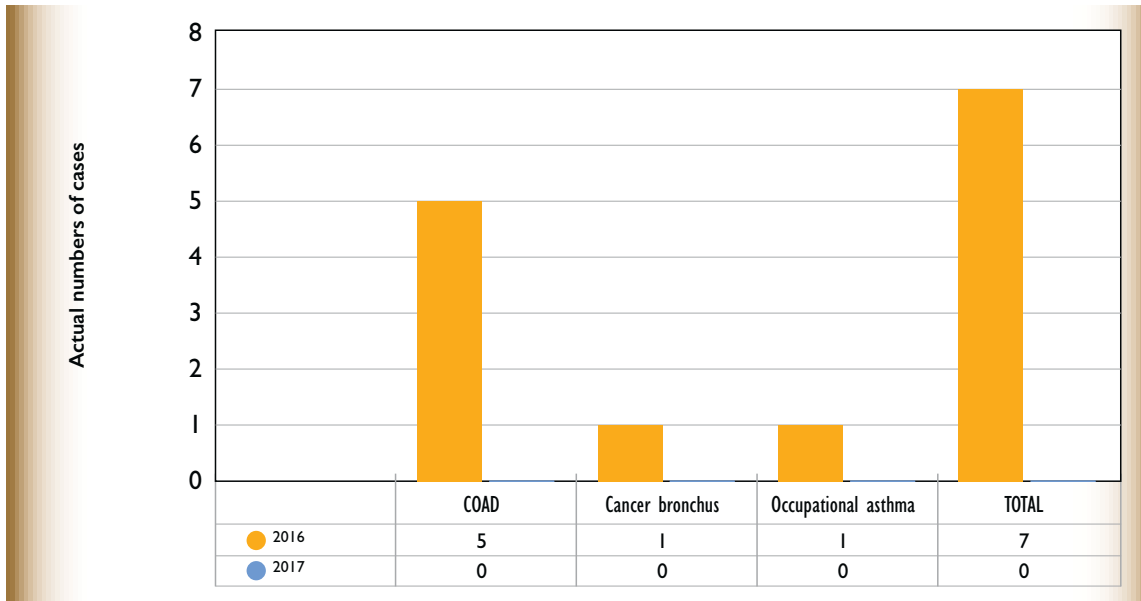
A decrease of 58% has been noted on the reported occupational diseases when compared to the previous year. PTB has decreased by 47% and NIHL has decreased by 57%. No silicosis and other occupational diseases have been reported whereas three and seven cases were reported in 2016 respectively. No Sil+TB, CWP and asbestosis cases were reported in both 2016 and 2017.

Employees are monitored on a frequent basis according to individual occupational risk exposure profile (OREP). Mines have created awareness on fatigue and lifestyle diseases management. Hearing conservation programmes in place at mines ensure that employees identified with a 10% percentage loss of hearing (PLH) and NIHL are closely monitored.

**Graph: 4.2.2.1.2(h): Occupational diseases reported from diamond mines' AMRs: 2016 and 2017**

**Graph: 4.2.2.1.2(i): Other occupational diseases reported from diamond mines' AMRs: 2016 and 2017**

No other occupational diseases were reported in the current year, whilst seven cases were reported during the previous year.

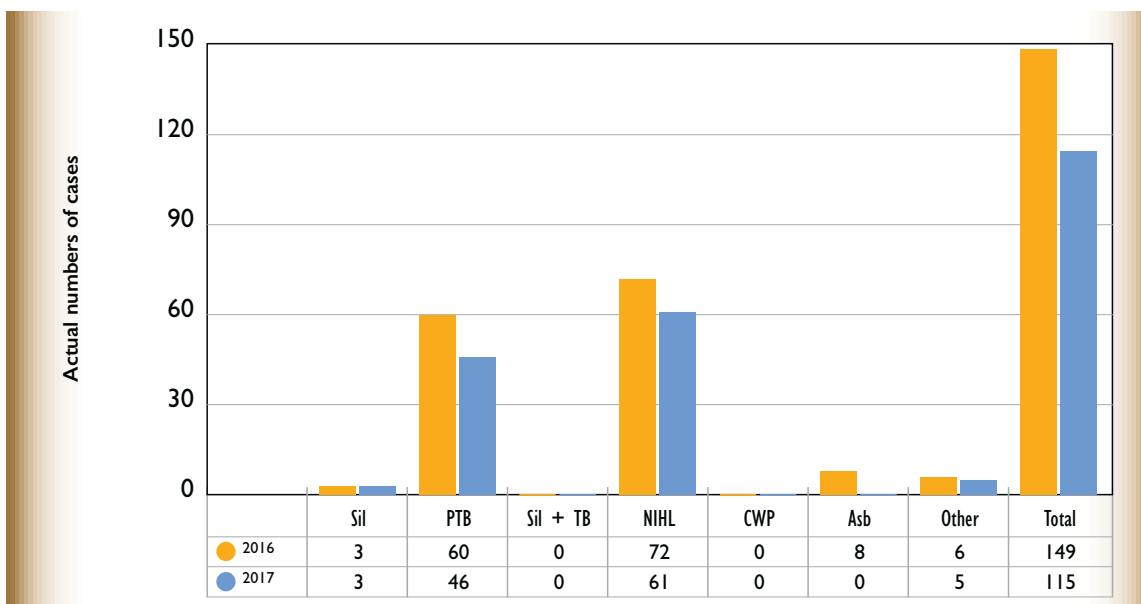


**Chrome mines**

There has been a decrease of 23% on occupational diseases reported when compared to the previous year. PTB has decreased by 23% and NIHL has decreased by 15%. Silicosis has remained unchanged at three cases reported in 2016 and 2017. No asbestosis cases have been reported whilst eight cases were reported during the previous year.

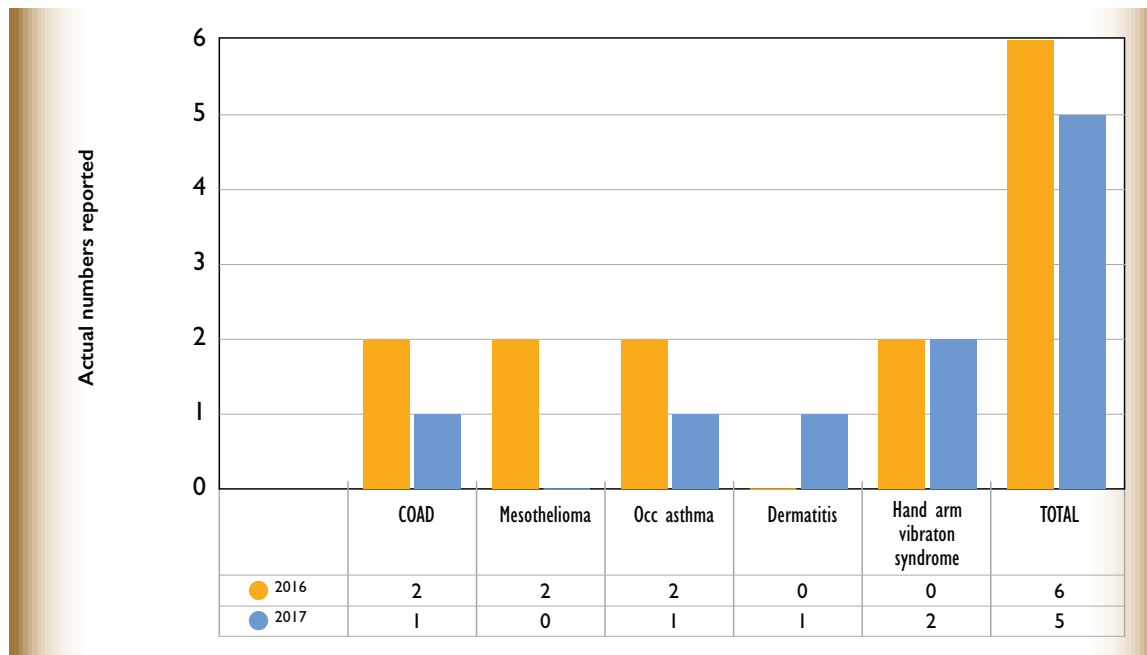
There has been a decrease in the incidence of TB cases diagnosed, but the incidence of NIHL cases that has been reported remains high despite a slight decrease noted.

**Graph: 4.2.2.1.2(j): Occupational diseases reported from chrome mines' AMRs: 2016 and 2017**



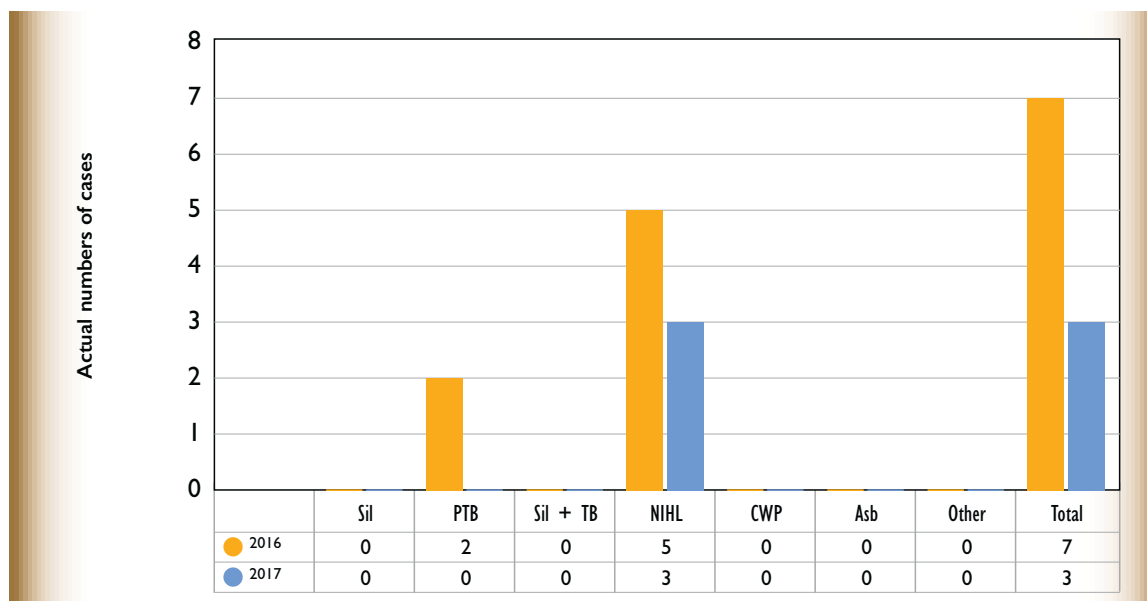
**Graph: 4.2.2.1.2(k): Other occupational diseases reported from chrome mines' AMRs: 2016 and 2017**

A decrease of 17% has been noted on other occupational diseases reported when compared to the previous year.



### Copper mines

The occupational diseases have decreased by 57% when compared to the previous year. NIHL has decreased by 40% and no PTB cases have been reported whilst two cases were reported in 2016. Silicosis, Sil+TB, CWP, asbestosis and other occupational diseases have not been reported for both reporting years.

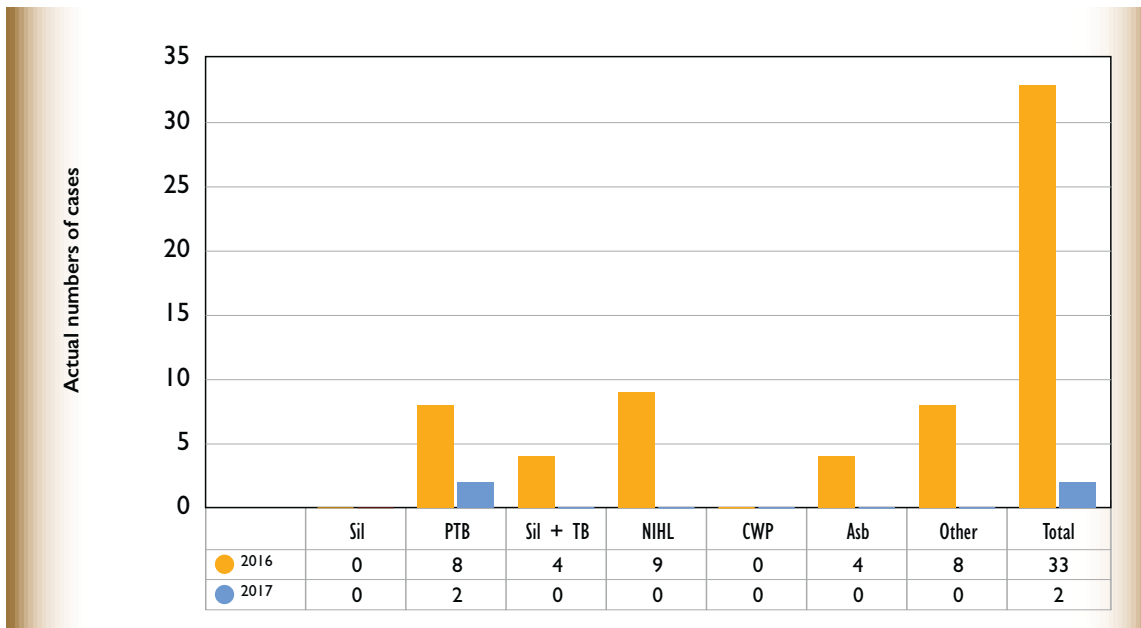
**Graph: 4.2.2.1.2(l): Occupational diseases reported from copper mines' AMRs: 2016 and 2017**

### Iron ore mines

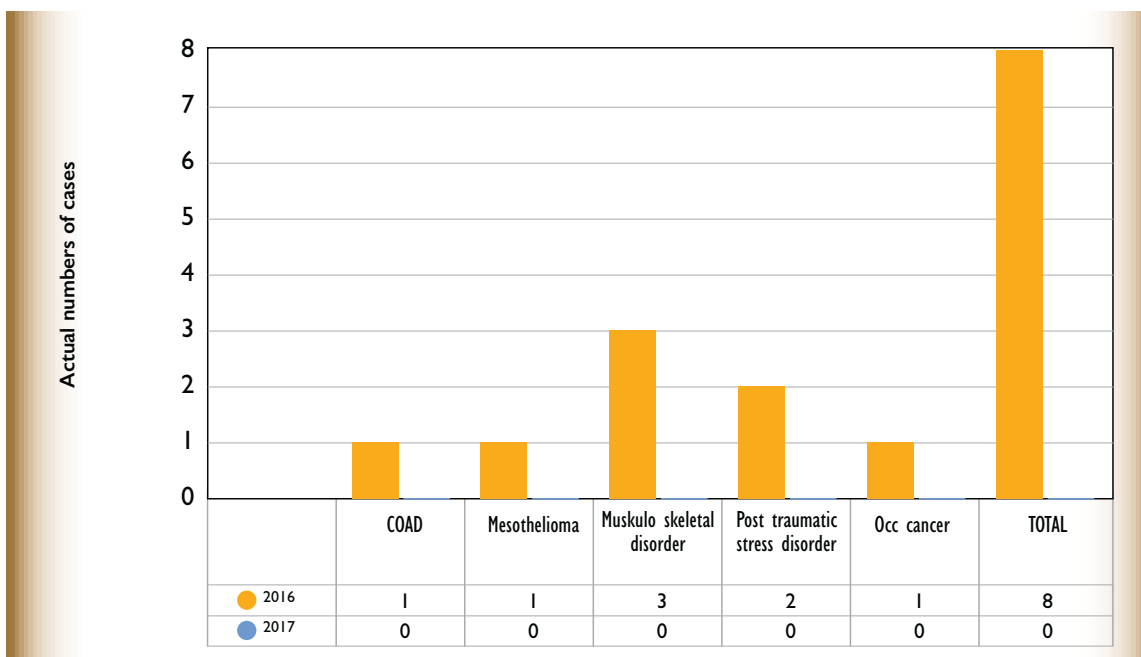
A decrease of 94% has been noted on the total number of occupational diseases reported when compared to the previous year. PTB has decreased by 75%, whilst no Sil+TB, NIHL, asbestosis and other occupational diseases cases have been reported; four, nine, four and eight cases were reported in 2016 respectively. No

silicosis and CWP cases have been reported in both reporting years.

Graph: 4.2.2.1.2(m): Occupational diseases reported from iron ore mines' AMRs: 2016 and 2017



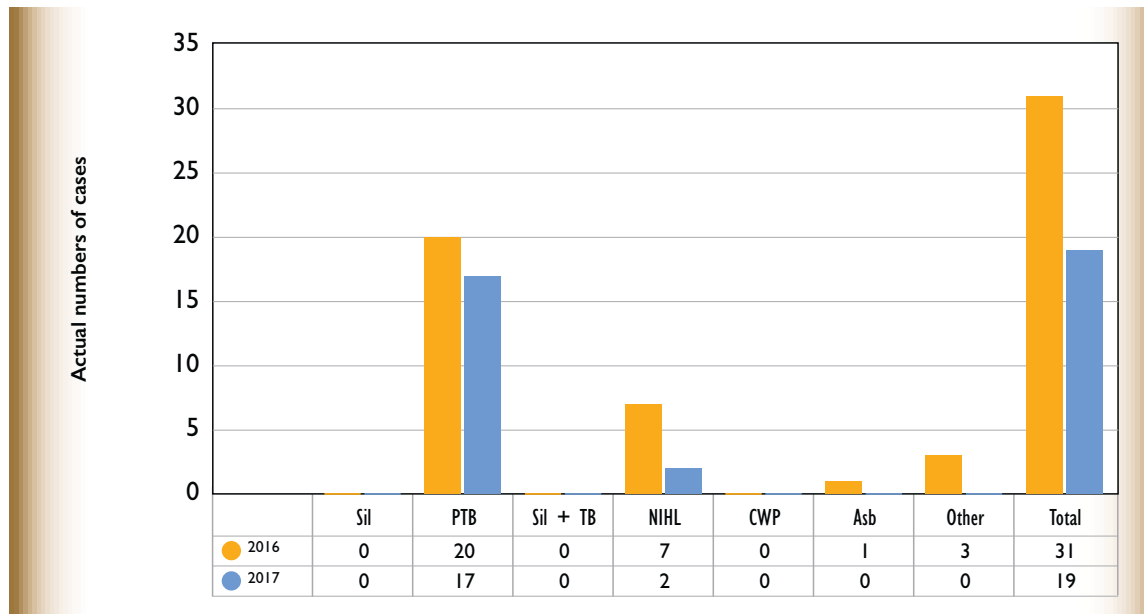
Graph: 4.2.2.1.2 (n): Other occupational diseases reported from iron ore mines' AMRs: 2016 and 2017



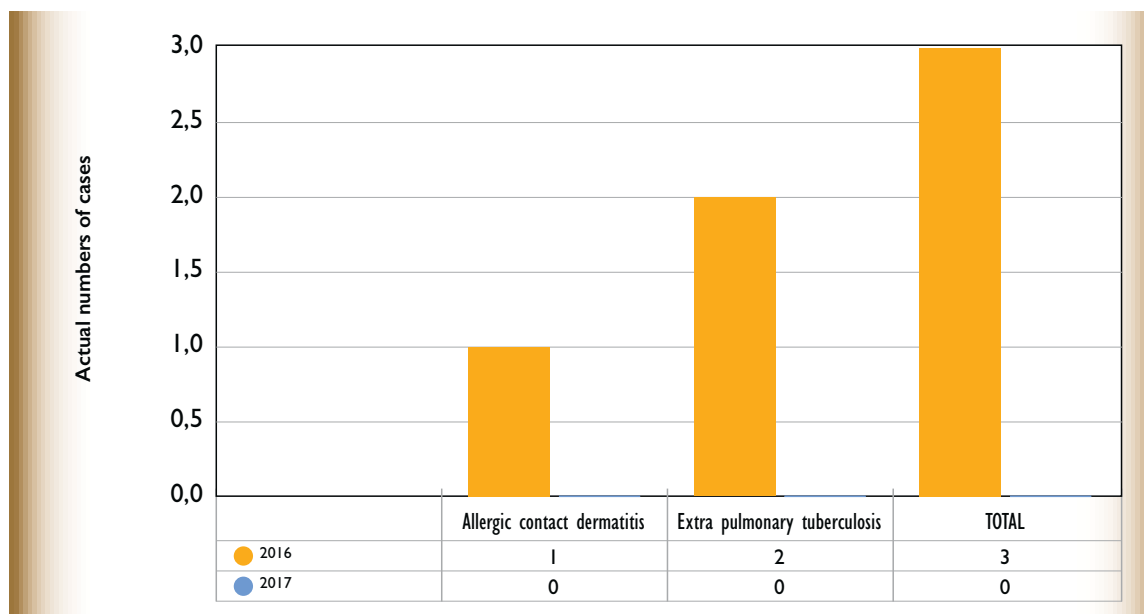
### Manganese mines

There has been a decrease of 39% on occupational diseases reported when compared to the previous year. PTB has shown a decrease of 15% and NIHL has decreased by 71%. No asbestosis and other occupational diseases have been reported whereas one and three cases were reported in 2016 respectively. No silicosis, Sil+TB and CWP cases were reported in both 2016 and 2017.

Graph: 4.2.2.1.2(o): Occupational diseases reported from manganese mines' AMRs: 2016 and 2017



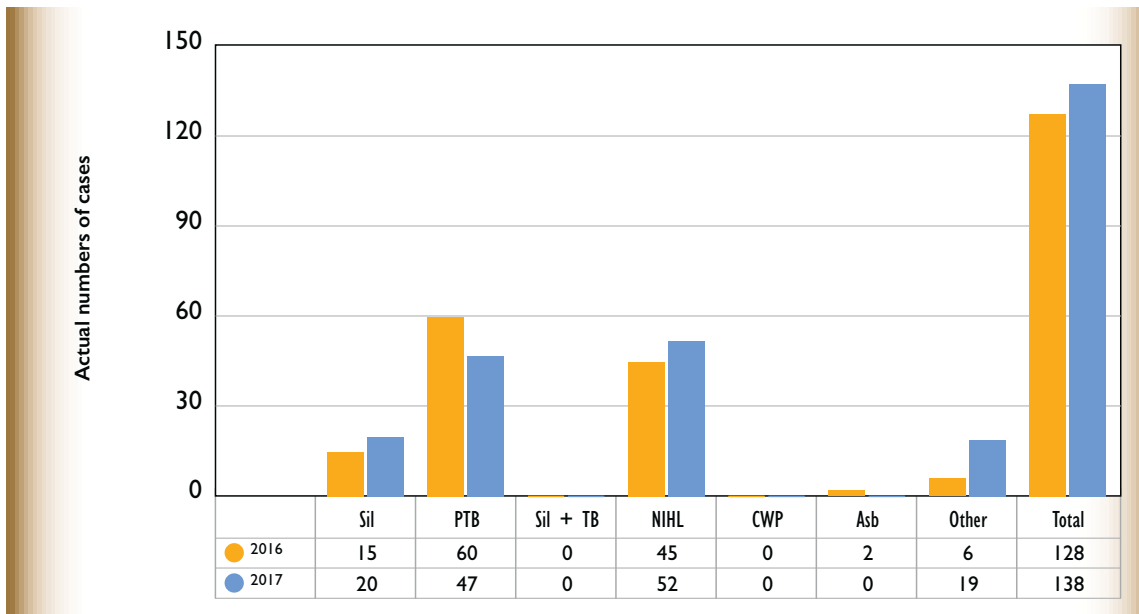
Graph: 4.2.2.1.2(p): Other occupational diseases reported from manganese mines' AMRs: 2016 and 2017



#### All other mines

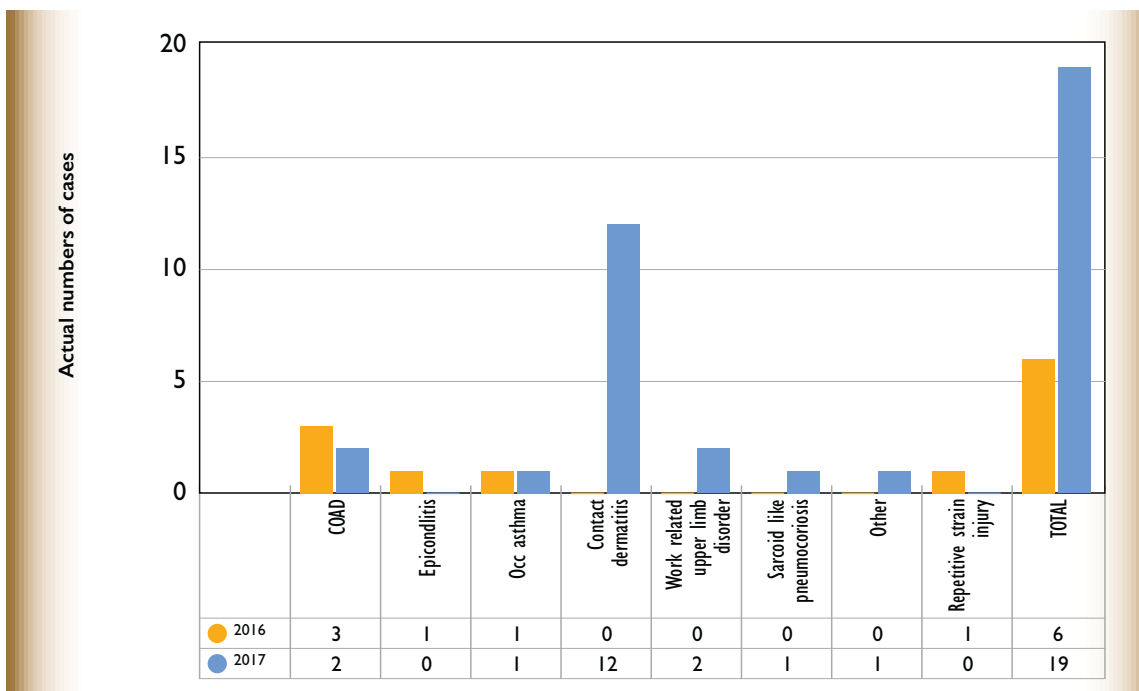
The occupational diseases reported have shown an increase of 8% when compared to the previous year. Silicosis has increased by 33%, NIHL has increased by 16% whilst PTB has decreased by 22%.

Graph: 4.2.2.1.2(q): Occupational diseases reported from all other mines' AMRs: 2016 and 2017



Graph: 4.2.2.1.2(r): Other occupational diseases reported from all other mines' AMRs: 2016 and 2017

A total of 19 other occupational diseases have been reported compared to six cases reported during the previous year.

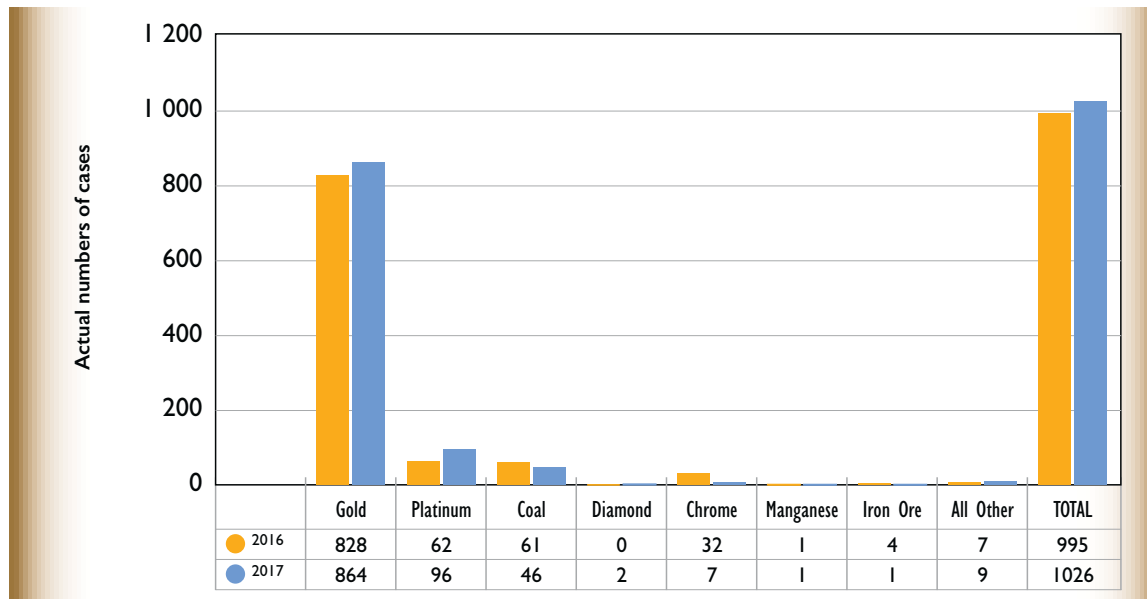


### Medical incapacity due to occupational diseases

There has been a 3% increase on medical incapacity cases reported due to occupational diseases. Cases reported from platinum mines have increased by 55%, followed by a 29% increase from all other mines, a 25% increase from coal mines and a 4% increase from gold mines. A decrease of 78% and 75% has been noted on cases reported from chrome and iron ore mines respectively when compared to the previous year. Cases from manganese mines have remained unchanged with one reported for both years.



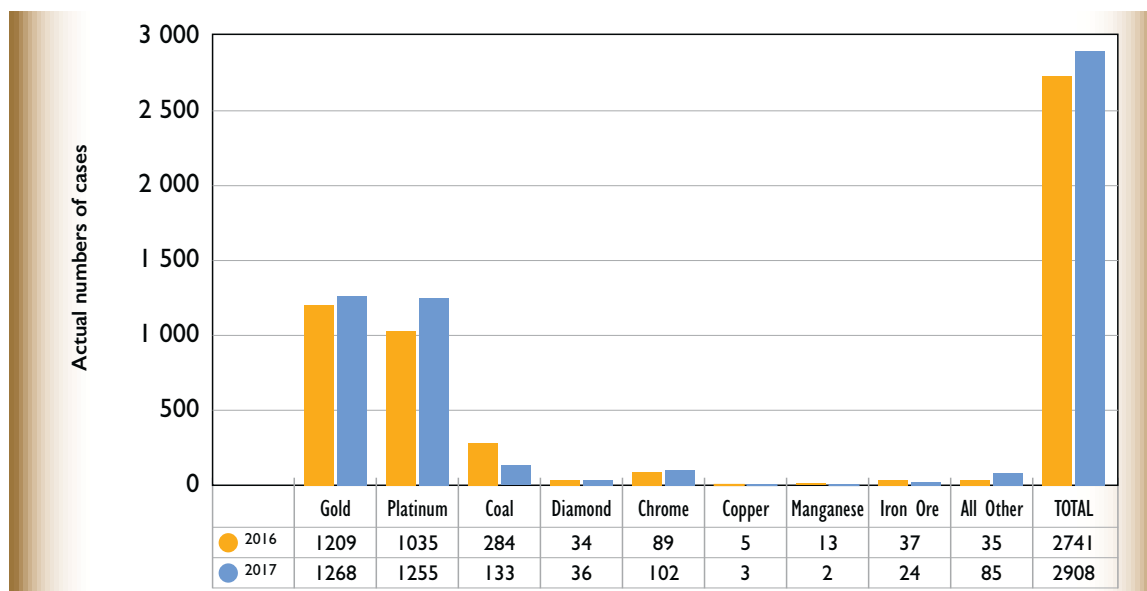
Graph: 4.2.2.1.2(s): Medical incapacity cases due to occupational diseases by commodity: 2016 and 2017



#### Medical incapacity due to non-occupational diseases

The total medical incapacity cases reported due to non-occupational diseases have shown an increase of 6% when compared to the previous year. Medical incapacity cases reported from gold mines have increased by 5%, platinum mines increased by 21%, diamond mines increased by 6%, chrome mines increased by 15% and all other mines increased by 143%. Cases reported from coal mines have decreased by 53%, copper mines decreased by 40% and manganese mines decreased 85% when compared to the previous year.

Graph: 4.2.2.1.2(t): Medical incapacity cases due to non-occupational diseases by commodity: 2016 and 2017

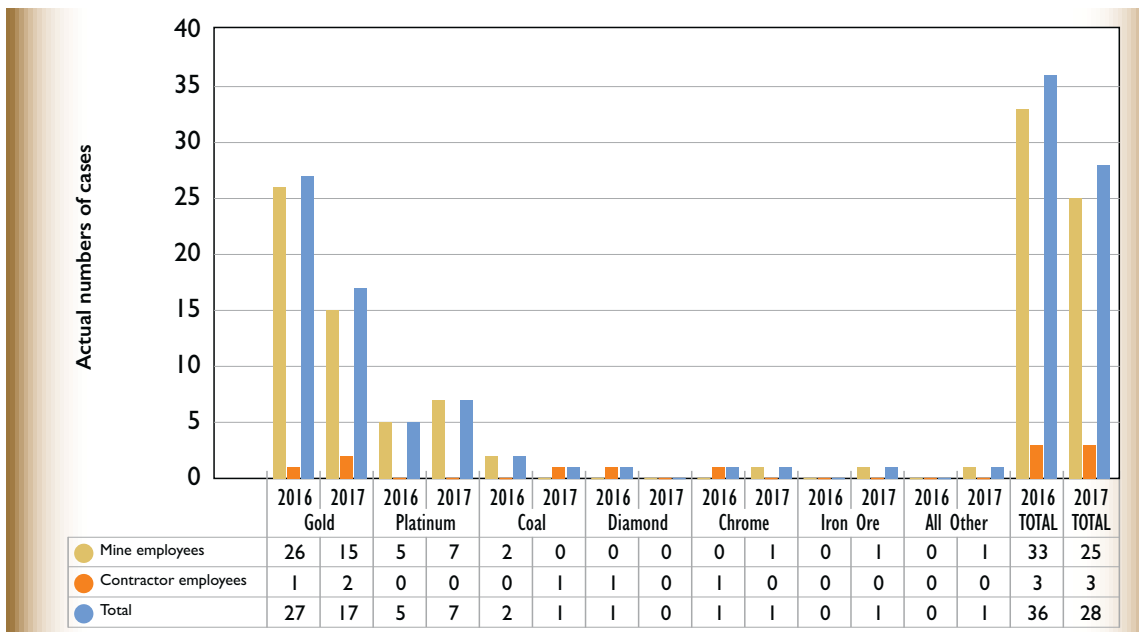


#### Fatalities due to occupational diseases

The total number of fatalities due to occupational diseases has shown a decrease of 22% when compared to the previous year. Fatalities reported from gold have shown a decrease of 37%, cases from coal mines have decreased by 50% and cases from diamond mines have decreased by 100%. Fatalities reported from platinum

mines have increased by 40%. No cases have been reported from iron ore and all other mines whilst one case was reported from each commodity respectively. Fatalities from chrome mines have remained unchanged with one case reported in 2016 and 2017.

**Graph: 4.2.2.1.2(u): Fatalities due to occupational diseases by commodity: 2016 and 2017**



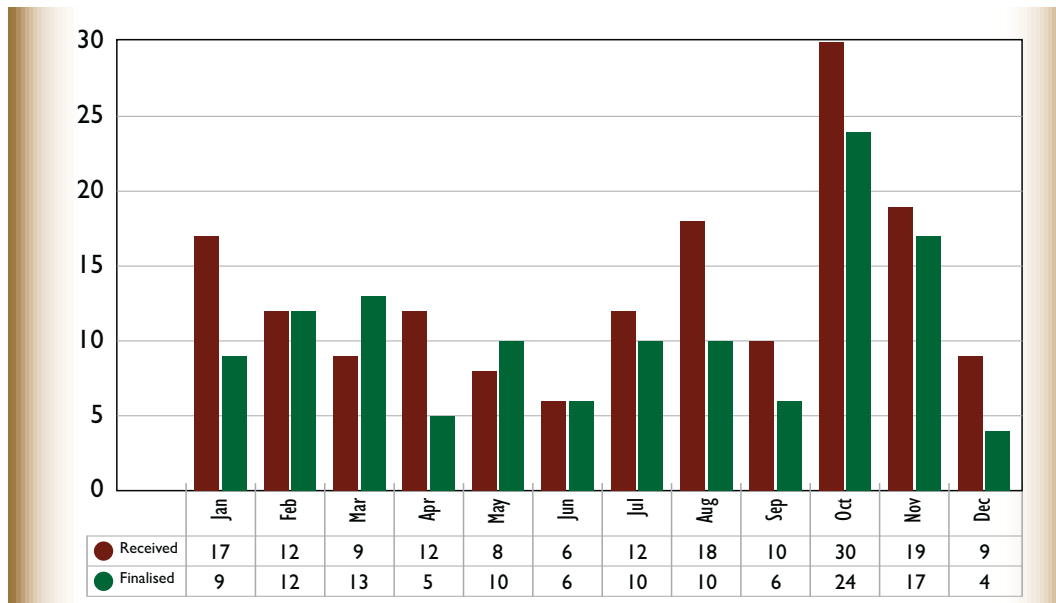
### 4.3 Medical Inspector’s report

The Medical Inspector is responsible for adjudicating on section 20 of the MHSA, as amended. This section allows for an employee to lodge an appeal to the Medical Inspector, based on two conditions only, which are related to disputing the decision of the OMP that the employee is unfit; or any finding contained in an exit medical certificate. It should be noted that findings in an exit medical certificate are separate from the issues of unfitness.

#### 4.3.1 Medical appeals

For the 2017 reporting period, there were 162 appeals received and 126 were completed. Appeals are processed to finality only if they meet one of the two conditions mentioned above and all relevant supporting documents are received.

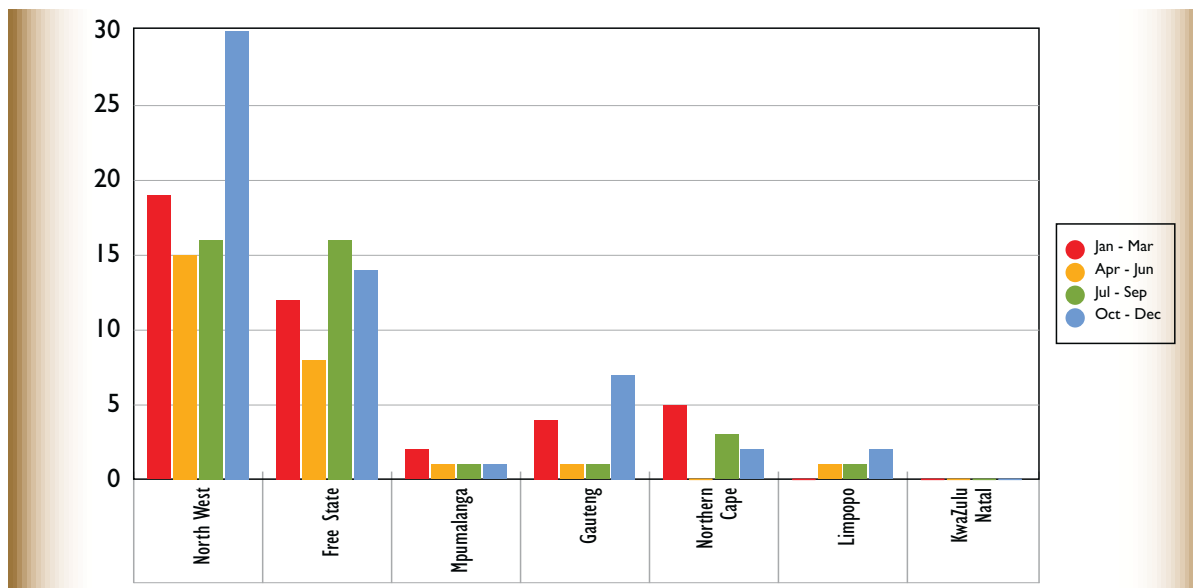
Figure 4.3.1: Appeals received and finalized for 2017



According to the graph above, there were lots of appeals received and completed in the months of October and November. These months correspond with the retrenchments that occurred in the mining industry, especially in the platinum and gold sectors.

### 4.3.2 Appeals received per region

Figure 4.3.2: Number of appeals per region from January to December 2017



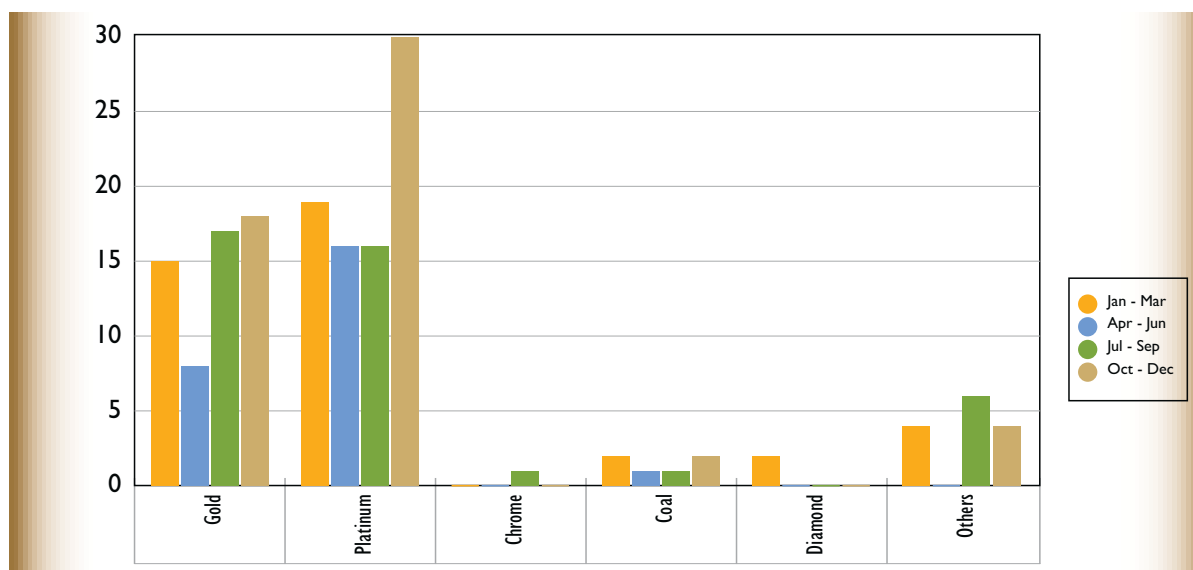
North West and Free State remain the regions contributing high numbers of medical appeals. Appeals from Gauteng have reduced as compared to 2016. Once again, no appeals were received from the Western Cape, KwaZulu-Natal and Eastern Cape regions for the reporting period of 2017.

### 4.3.3 Appeals received per commodity

Table 4.3.3: Appeals received per commodity

	Gold	Platinum	Chrome	Coal	Diamond	Others	TOTAL
Jan - Mar	15	19	0	2	2	4	42
Apr - Jun	8	16	0	1	0	0	25
Jul - Sep	17	16	1	1	0	6	41
Oct - Dec	18	30	0	2	0	4	54
TOTAL	58	81	1	6	2	14	162

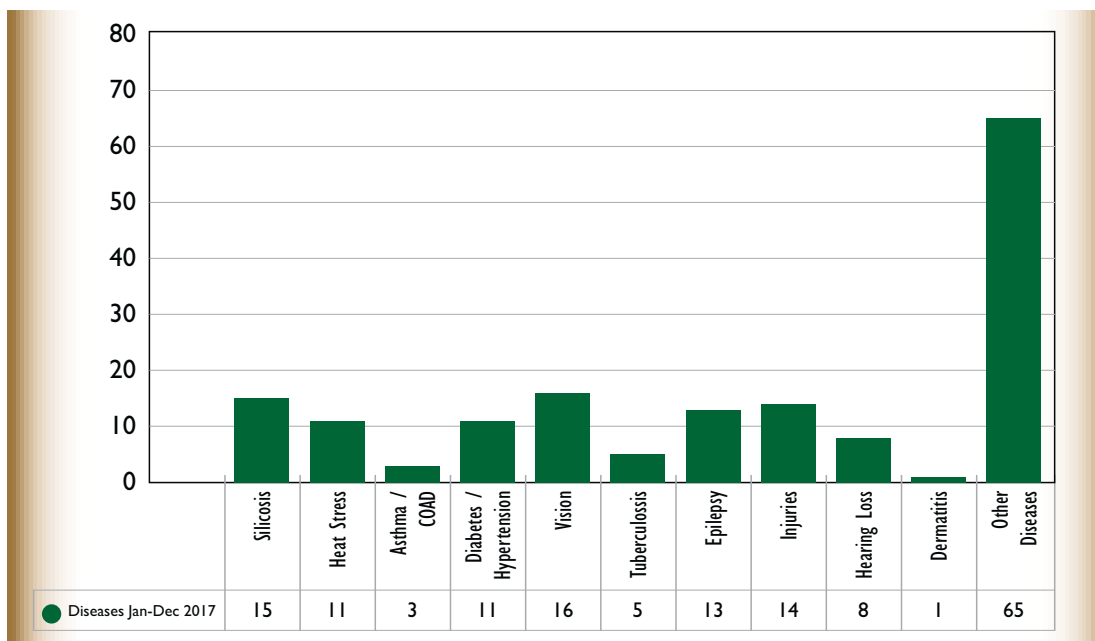
Figure 4.3.3: Appeals received per commodity from January to December 2017



A number of medical appeals were received from the platinum mines, especially during October to December. This is the period when the mines changed ownership and some employees were medically incapacitated, resulting in employment terminated. The commodities correspond to the regions that contributed to appeals as shown in the graph representing number of appeals per region. These involved North West: Rustenburg; where platinum is found and Free State and Gauteng; where gold is found.

#### 4.3.4 Diseases associated with appeals received for 2017

Figure 4.3.4: Diseases associated with appeals received for 2017

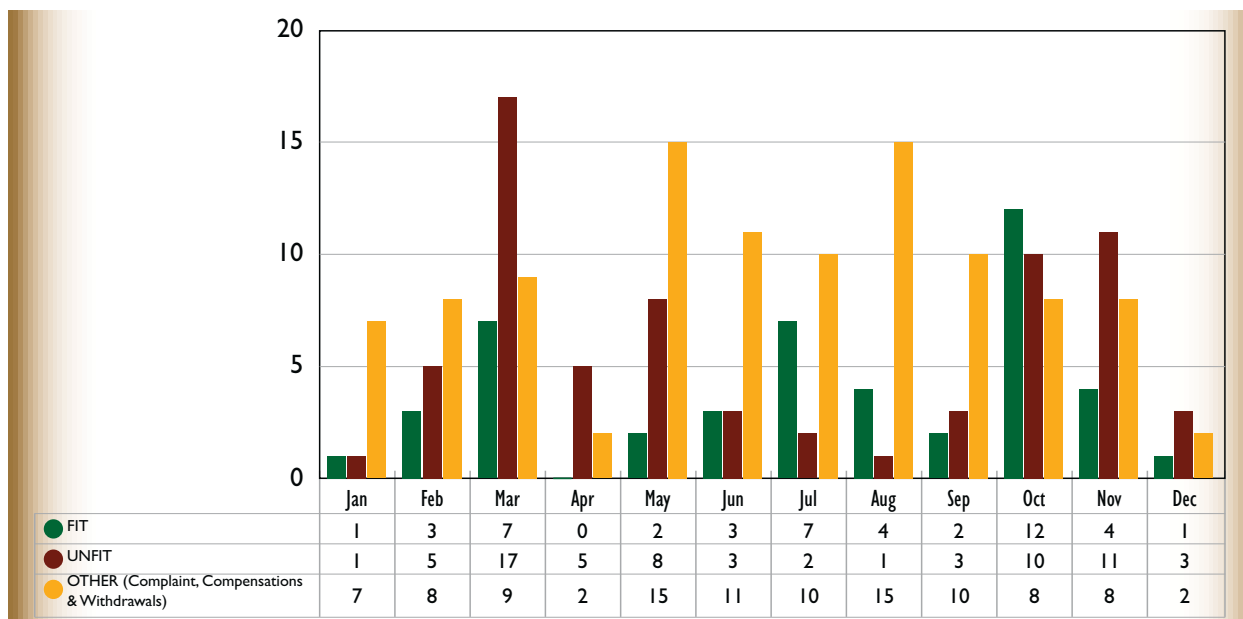


The number of silicosis cases increased from seven in 2016 to 15 for the reporting period. Most cases of first degree silicosis were declared unfit. The less common diseases were all grouped together and comprised, amongst others bipolar mood disorder; obesity; different carcinomas, renal failure; cardiac problems and other lung diseases.

#### 4.3.5 Appeal findings

It should be born in mind that the MHSA (1996, as amended) gives the Medical Inspector the right to vary, confirm or set aside the decision of the OMP. Suffice to say that any of the decisions may apply after an appeal has been finalised. The Medical Inspector embarks on a holistic approach to gather all necessary facts to conclude on all the appeals. Approximately 21% of appellants were found to be fit, thus the decisions of the OMP were set aside. 31% were found to be unfit and the decisions of the OMP were confirmed. The rest of the cases, at 48 %, were varied since they did not require a decision on fitness.

Figure 4.3.5: Appeal findings from January to December 2017



### 4.3.6 Challenges to the Appeal Process

The appeal process involves many stakeholders thus challenges occur when stakeholders are not in agreement. There are different expectations from these stakeholders, i.e. employees expect the Medical Inspector to set aside all the OMP decisions and OMPs also expect the Medical Inspector to confirm their decisions. The following remain the main challenges:

#### Employees:

1. Appealing against unfair labour processes, which should be referred to the Commission for Conciliation, Mediation and Arbitration (CCMA):
2. Appealing through a private practitioner, causing undue delays.
3. Raising compensation problems through the appeals system.
4. Expecting an outcome in their favour all the time, even when the facts do not support their case.

#### Employers (Occupational Medical Practitioner):

- Fear of making decisions pertaining to fitness of employees.
- Using a blanket approach to make decisions on fitness of employees.
- Failure to provide adequate reasons for declaring employees unfit.
- Delay in providing a report on reasons for decisions for unfitness.
- Pressure to make unethical decisions because of dual loyalty

#### Second opinion doctors sourced by employees:

1. Not providing reports to the Medical Inspector after assessing employees.
2. Misleading employees that they are final decision-makers on appeals.

3. Interfering in the normal appeal process, causing unnecessary delays.
4. Challenging the decision of the Medical Inspector without proper facts.
5. Charging employees a fee for a free service provided by the Department.
6. Unprofessional conduct of harassing department's officials dealing with appeals.

### Section 20 of the MHSA

1. Not in sync with medical developments and ethics.
2. Not clear, hence misinterpreted.

It is hoped that amendment of section 20 of the MHSA by the Department will help to have legislation in sync with medical developments and ethics, as well as to assist in the interpretation of the Act.

## 4.4 Reporting on TB and HIV

During the period under review, 687 mines with 473 972 employees complied with the reporting requirements, as compared with 663 mines representing 455 681 employees in 2016. The analysis presented in this report is based on TB and HIV data on DMR 164 received from the mines.

### 4.4.1 Compliance for all mines

**Table 4.4.1(a): Compliance for all mines per commodity: 2017**

MEASURE	COAL	DIAMONDS	GOLD	PLATINUM	OTHER COMMODITIES	TOTAL
	Number of mines: 123	Number of mines: 99	Number of mines: 48	Number of mines: 72	Number of mines 345	Total mines: 687
	Employees: 90 738	Employees: 12 945	Employees: 102 953	Employees: 171 323	Employees: 96 013	Employees: 473 972
Integrated HIV and TB policy	113 (91.9%)	95 (96.0%)	38 (79.2%)	72 (100.0%)	321 (93.2%)	639 (93.0%)
Integrated HIV and TB programme	108 (87.8%)	62 (62.9%)	47 (97.9%)	71 (98.6%)	252 (73.5%)	540 (78.6%)
HIV & TB Programme budget	74 (60.3%)	19 (19.2%)	44 (91.7%)	70 (97.2%)	186 (54.1%)	393 (57.2%)
Manage its own employees, including contractors	78 (63.4%)	87 (90.0%)	43 (89.6%)	44 (61.1%)	180 (52.9%)	432 (62.9%)

In 2017, total compliance for an integrated HIV and TB policy was at 93.0%, and compliance for an integrated HIV and TB programme was lower, at 78.6%. The overall HIV and TB programme budget stood at 57.2%. It is, however noted that the diamond sector contributed to the low compliance relating to HIV and TB programme budget. Compliance measures dealing with mines that also manage contractors besides their own employees, was at 62.9%.

There is an overall increase in the number of mines that have submitted DMR 164 forms, which resulted in an overall improvement in compliance measures. However, both diamond and coal sectors reported a decline in numbers of employees due to downsizing.

Table 4.4.1(b): HIV counselling and testing services and TB programme data elements for all commodities in 2017

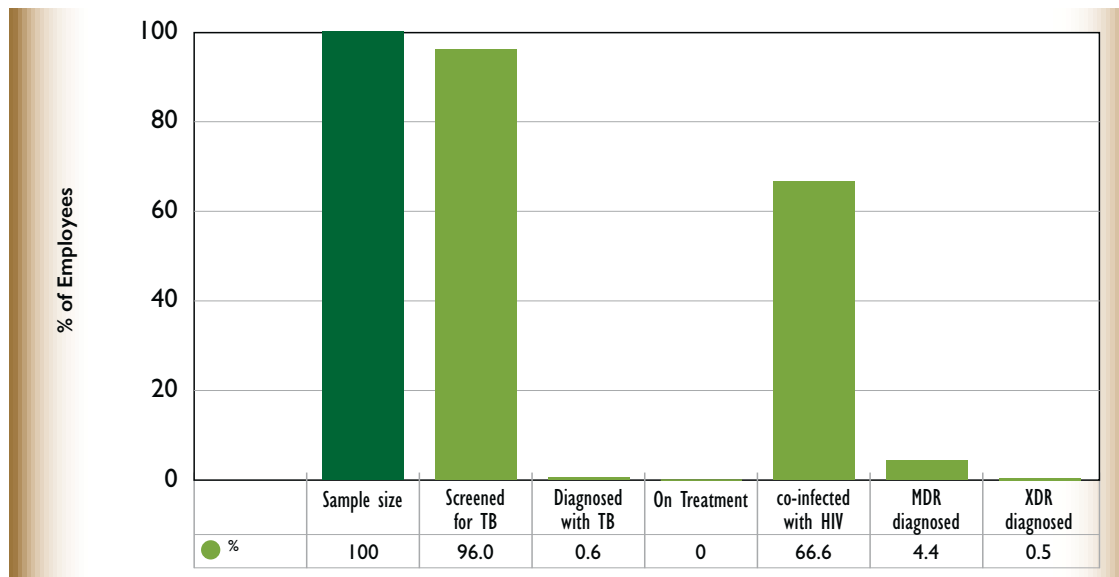
	COAL	DIAMONDS	GOLD	PLATINUM	OTHER COMMODITIES	TOTAL
Data elements	Number of mines: 123	Number of mines: 99	Number of mines: 48	Number of mines: 72	Number of mines: 345	Total mines: 687
	Employees: 90 738	Employees: 12 945	Employees: 102 953	Employees: 171 323	Employees: 96 013	Employees: 473 972
Counselled for HIV	49 850 (54.9%)	7 589 (58.6%)	59 936 (58.2%)	154 293 (90.1%)	57 894 (60.3%)	329 562 (69.5%)
Tested for HIV	26 163 (52.5%)	5744 (75.7%)	45 887 (76.6%)	93 407 (60.5%)	34 832 (60.2%)	206 033 (62.5%)
HIV positive	1 002 (7.9%)	78 (1.4%)	2 896 (6.3%)	11 247 (12.0%)	1 070 (3.1%)	16 293 (7.9%)
Co-infected with TB and HIV	147 (76.3%)	12 (66.7%)	736 (70.2%)	639 (64.2%)	185 (55.9%)	1 719 (66.6%)
Living with HIV and on ARVs	3 630	386	14 920	17 720	2 652	39 308
Screened for TB	82 599 (91%)	12 090 (93.4%)	101 163 (96.3%)	165 027 (96.3%)	94 289 (98.2%)	455 242 (96.0%)
Diagnosed with TB	189 (0.2%)	18 (0.1%)	1 048 (1.0%)	995 (0.6%)	331 (0.4%)	2 581 (0.6%)
On TB treatment	207	18	955	995	239	2 414
Diagnosed with MDR-TB	18 (9.7%)	1 (5.6%)	41 (3.9%)	30 (3.0%)	24 (7.3%)	114 (4.4%)
On MDR-TB treatment	16	1	49	35	12	113
Diagnosed with XDR-TB	3 (1.6%)	0 (0.0%)	6 (0.6%)	3 (0.3%)	0 (0.0%)	12 (0.5%)
On XDR-TB treatment	3	0	5	3	0	11

The total number of employees diagnosed with TB was 2 581 (0.6%) in 2017, compared to 3 799 (0.9%) in 2016. Of note is that only 0.6% of those who were screened for TB were diagnosed with TB. This is a significant decrease and could be attributed to the impact of TB awareness campaigns that take place in the mining industry.



#### 4.4.2 TB programme and TB/HIV co-infection in all mines

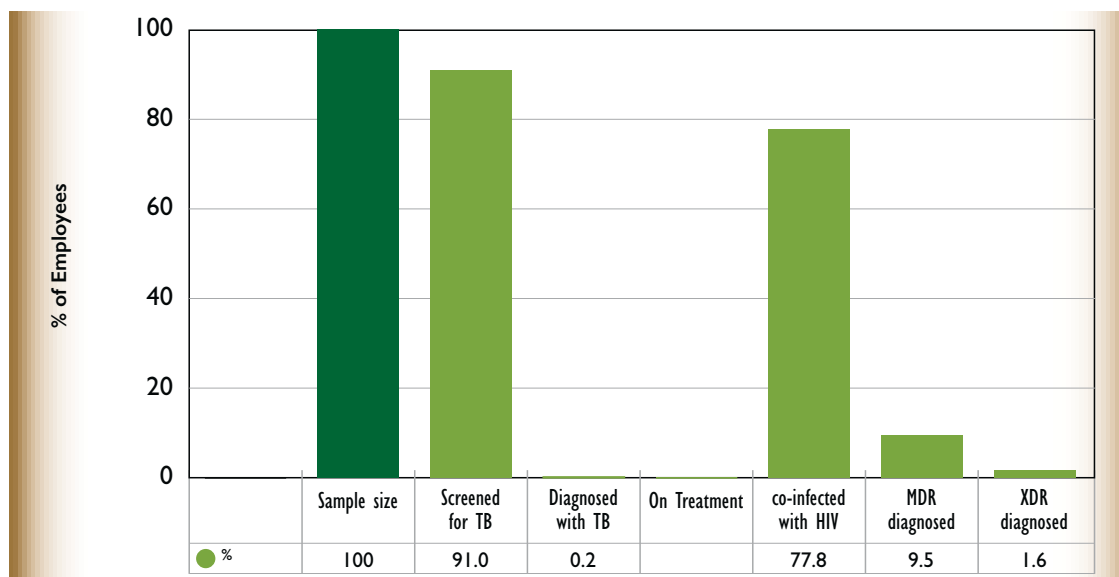
Figure 4.4.2: TB programme and TB/HIV co-infection in all mines



The total number of employees screened for TB remained above 90% for the reporting period of 2017. The co-infection rate has however increased from 62.0% in 2016 to 66.6% in 2017.

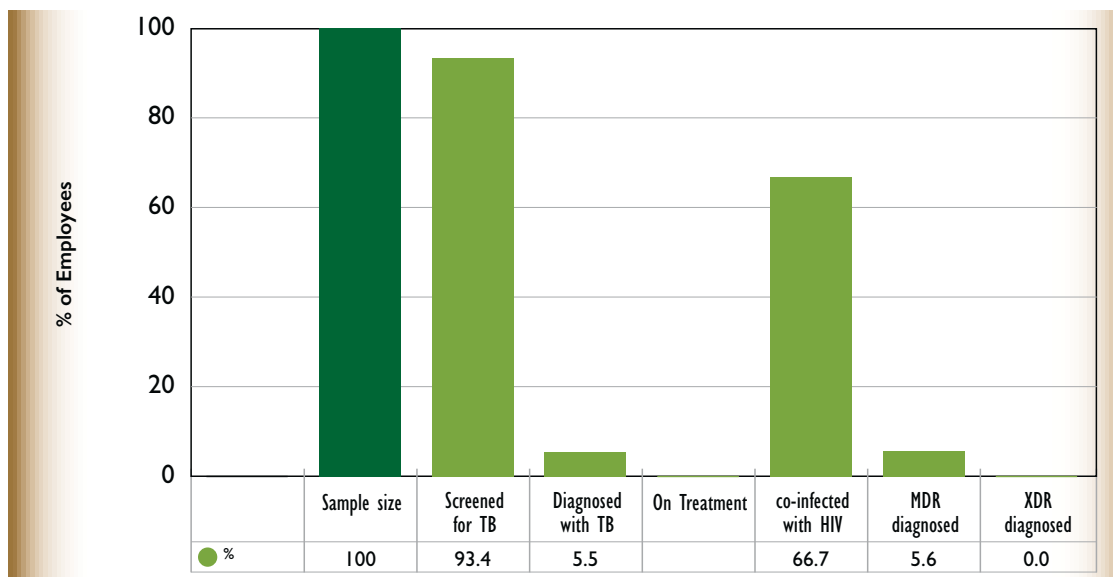
#### 4.4.3 TB programme and TB/HIV co-infection per commodity

Figure 4.4.3(a): Coal



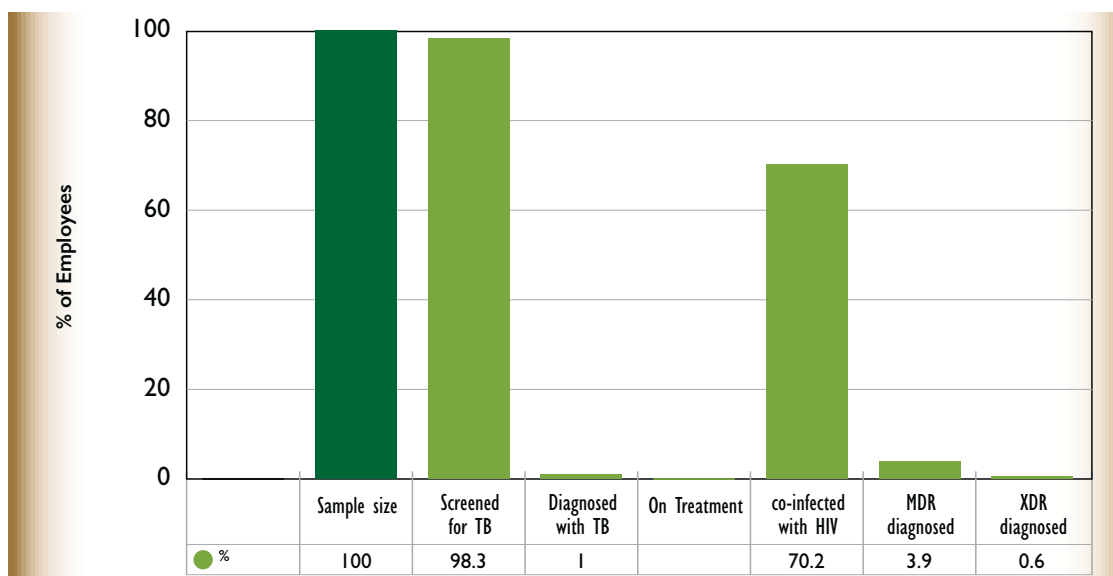
The coal sector achieved the first 90 of the 90-90-90 strategy. On the other hand, small coal mines still need to do much in terms of information, education and communication. The co-infection rate has decreased from 87.2% in 2016 to 77.8% in 2017

Figure 4.4.3(b): Diamonds



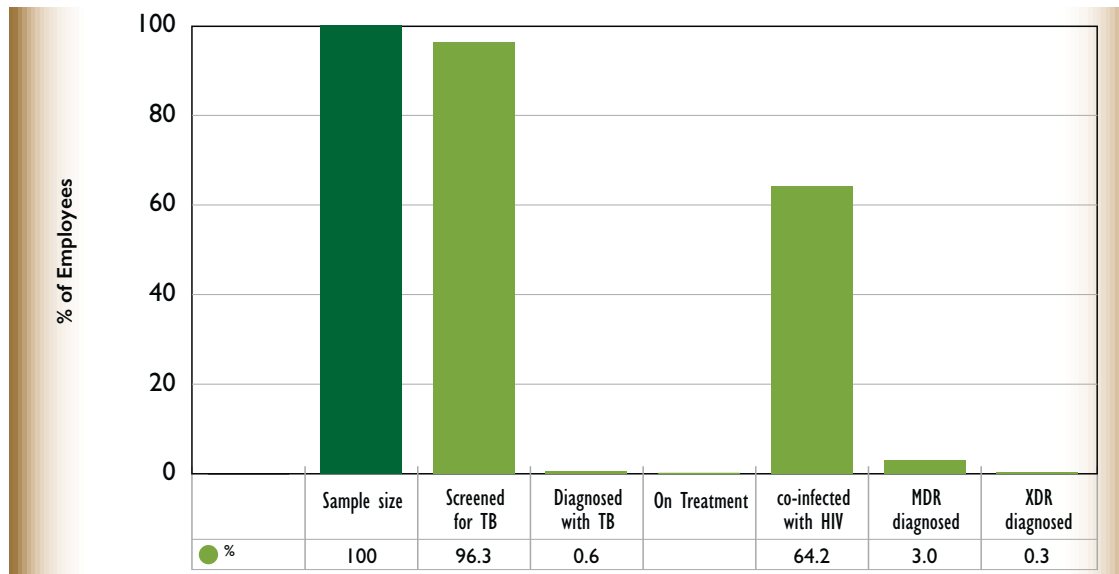
Approximately, 93.4% of employees in the diamond sector were screened for TB compared with 90% in 2016. Only 5.5% of employees were diagnosed with TB. The co-infection rate increased from 46.3% in 2016 to 66.7% in 2017. This sector is marked by small diamond diggers and relies on public health facilities.

Figure 4.4.3(c): Gold



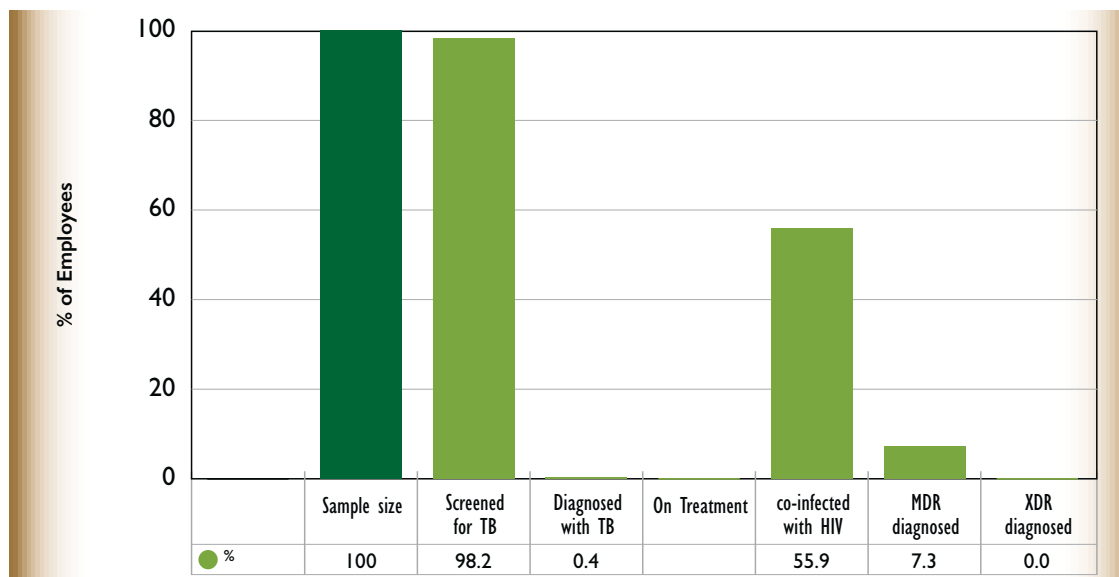
TB screening in the gold sector is still high at 98%, although showing a slight decrease from almost 100% in 2016. There was a slight improvement in employees diagnosed with TB in 2016 from 1.5% to 1% in 2017. The co-infection rate remains at approximately 70%.

Figure 4.4.3(d): Platinum



Approximately 96 % of employees were screened for TB during the period under review and 0.6% of those screened were diagnosed with TB. TB treatment adherence was consistent with the number of employees diagnosed with TB. The co-infection rate was 64.2% for the platinum sector.

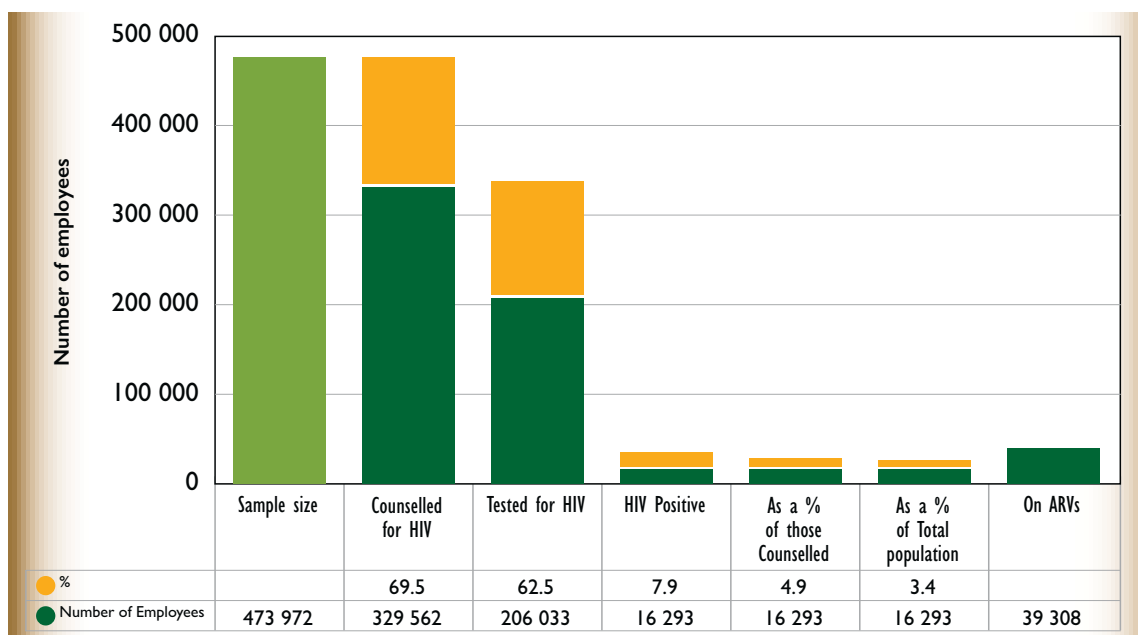
Figure 4.4.3(e): Other commodities



Although other commodities are characterised by small mines, they also comprise a few mining companies with many employees. TB screening was at 98.2% in 2017, which is commendable as most small mines do not provide their own health services. In 2016 it was 95%. This implies that there is effective collaboration between the mines and public services in terms of health care.

#### 4.4.4 HCT services in all mines for 2017

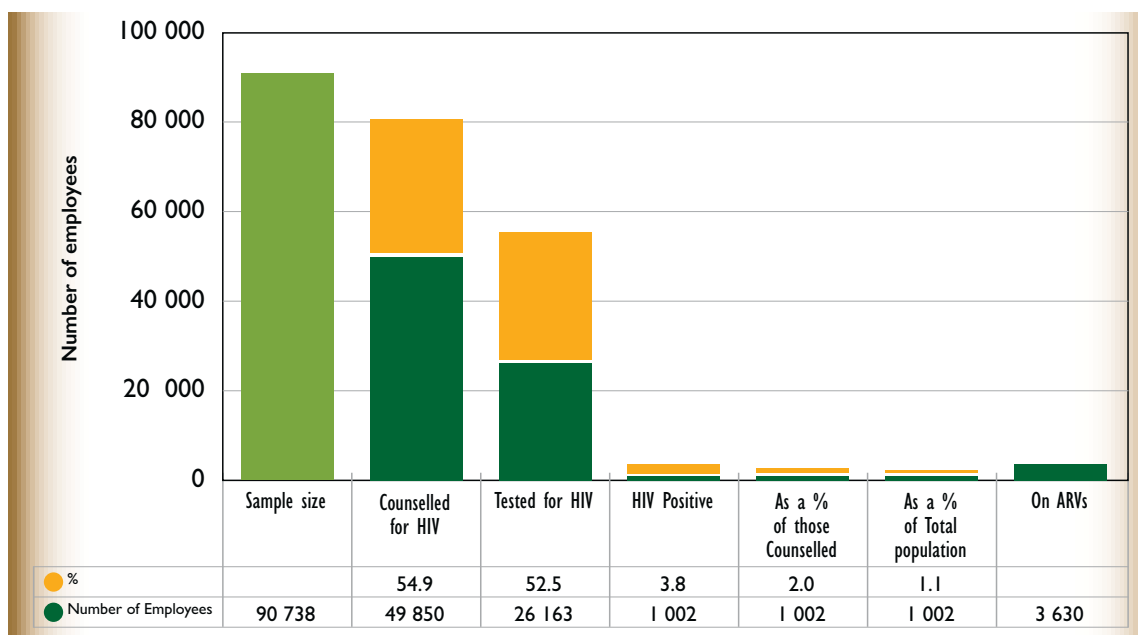
Figure 4.4.4: HCT services in all mines for 2017



Of the 329 562 employees counselled for HIV, 62.5% opted to get tested. Although this is far below 90%, there is an indication that the industry is on track towards achieving the UNAIDS 90-90-90 HIV Strategy. With the envisaged implementation of HIV self-screening test, it is hoped that HIV testing coverage will be increased.

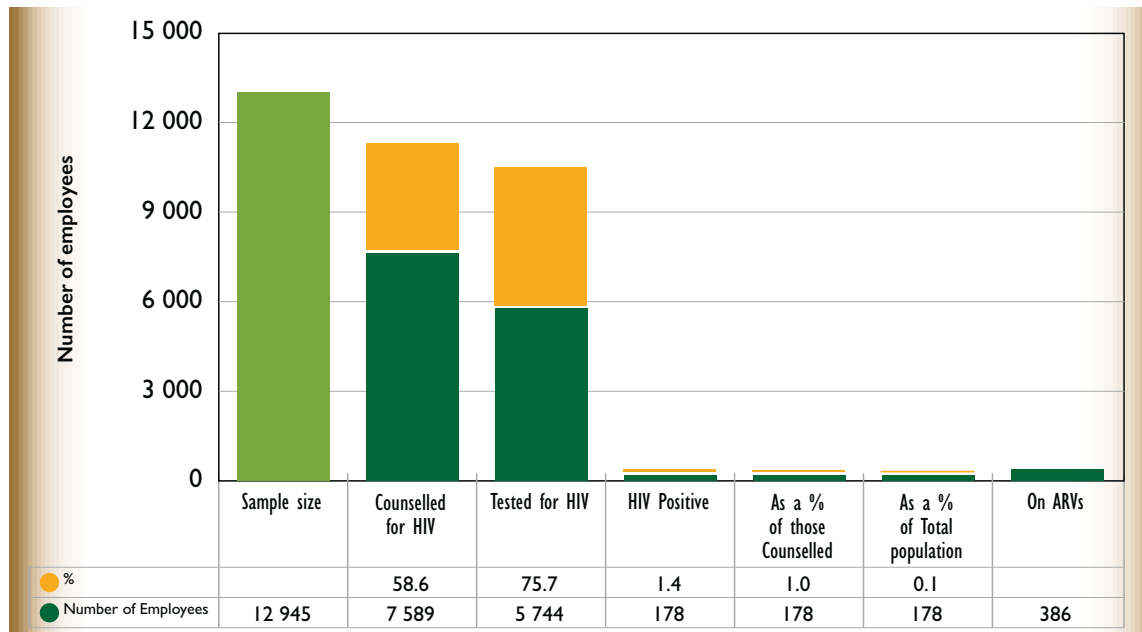
#### 4.4.5 HCT services per commodities

Figure 4.4.5(a): Coal



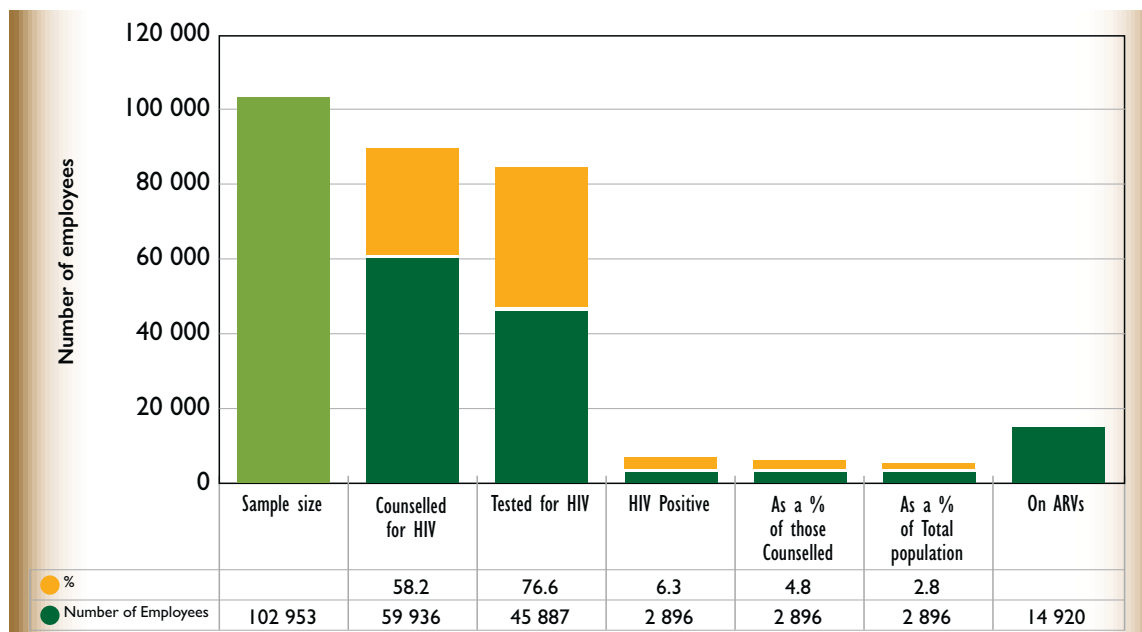
For the coal sector, 52.5% employees tested for HIV in 2017 as compared with 75.3% in 2016. There has been a significant decrease in employees who tested positive at 3.8%, as compared to 7.4% in 2016. Some employees might not have been tested because they already knew their status.

Figure 4.4.5(b): Diamonds



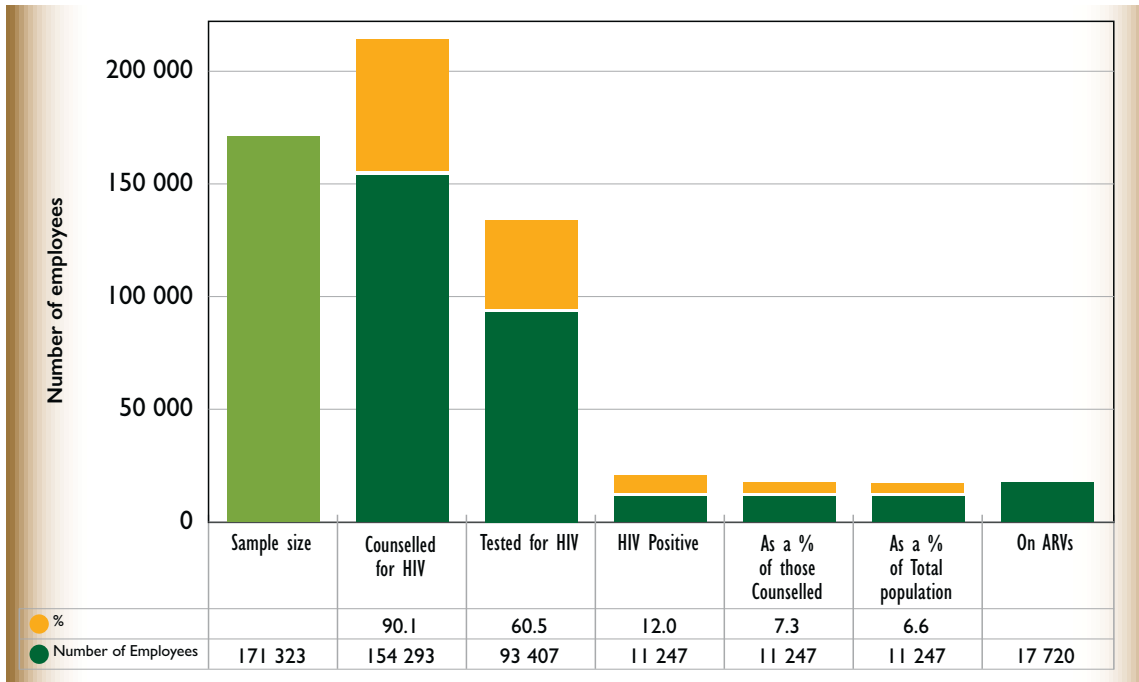
Only 58.6% of employees in the diamond sector were counselled for HIV, 75.7% of whom opted to be tested, and 1.4% tested positive. HIV testing services are mainly outsourced. Although there is improved collaboration between this sector and key-partners, coordination of data remains one of the challenges. Concerted efforts are being made to address this challenge.

Figure 4.4.5(c): Gold



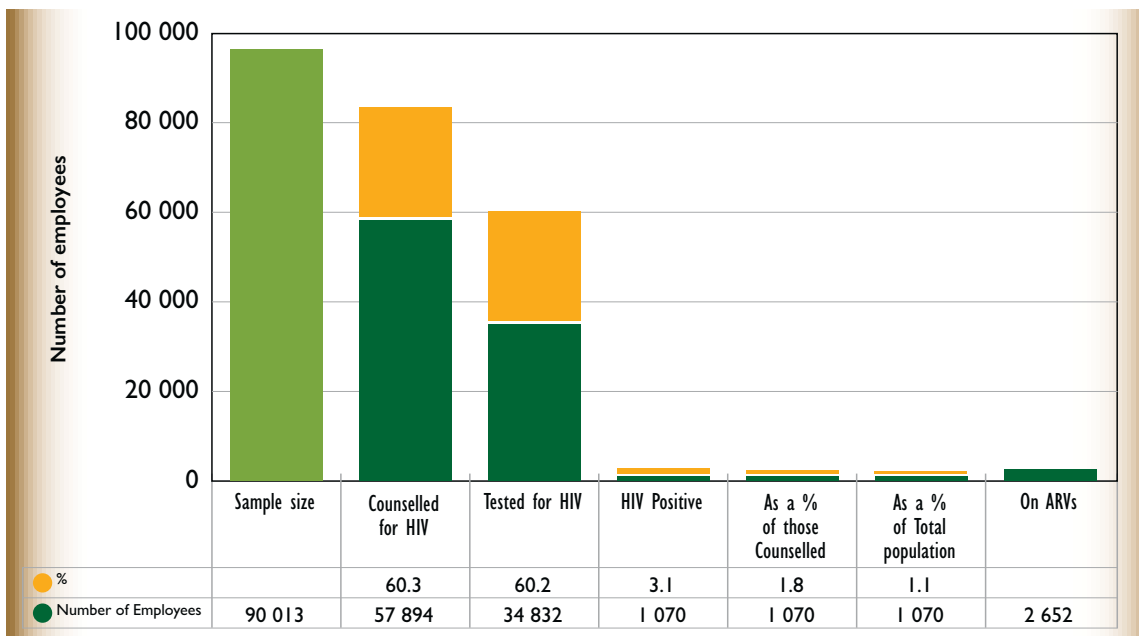
Of the 59 936 employees who were counselled, 76.6% opted to undergo HIV testing and 6.3% tested HIV positive. It is impressive that almost 77% of employees in the gold sector undertook the HIV test, considering that this test cannot be performed without an employee's consent.

Figure 4.4.5(d): Platinum



HIV counselling in the platinum sector was impressive at 90% in 2017, whilst it was 83% in 2016. Of those counselled, 60.5% tested for HIV and 12% were found to be HIV positive. As in the previous year, this sector reported the highest percentage in HIV counselling as compared with other commodities. This could be attributed to robust advocacy, communication and social mobilisation strategies at some mining companies.

Figure 4.4.5(e): Other commodities



Other mines counselled 60.3% of their employees and 60.2% of those counselled underwent HIV testing. Employees who tested HIV positive in 2017 were 3.1% as compared to 4.7% in 2016. Other commodities mostly rely on mobile clinics for HIV and testing services.

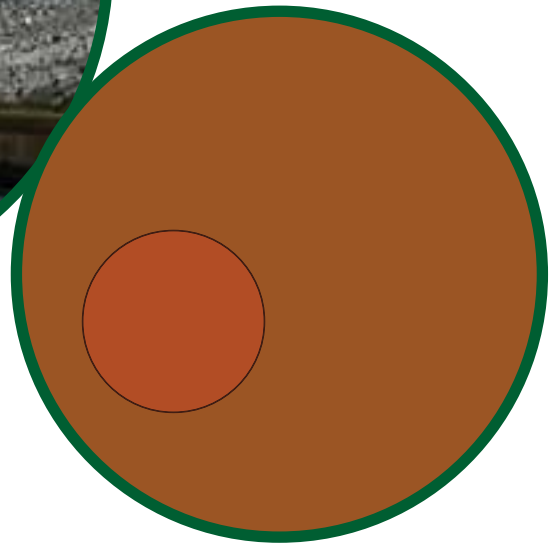
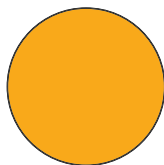
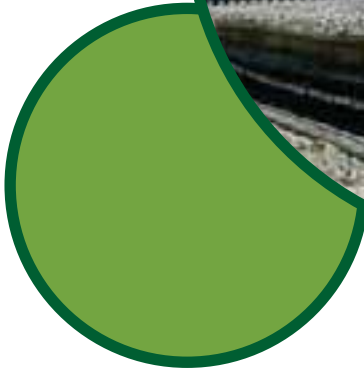
The table below summarises the trends from 2013 to 2017. These trends will be used to identify mines that have challenges when measured against the national picture. Mines that did not do well have been identified and will be consulted and visited accordingly. Of note is that there are still mines that do not have integrated

TB and HIV policies yet. Policies must have guidelines on key strategies and implementation plans. Mines must dedicate budgets for TB and HIV programmes, irrespective of sector or size.

**Table 4.4.5: Trends of data elements for reporting years: 2013, 2014, 2015, 2016 and 2017**

Data elements	Total labour force: 2013 (423 032)	Total labour force: 2014 (465 923)	Total labour force: 2015 (476 625)	Total labour force: 2016 (455 681)	Total labour force: 2017 (473 972)
Counselled for HIV	229 151 (54.2%)	259 297 (55.7%)	299 566 (62.9%)	299 444 (65.7%)	329 562 (69.5%)
Tested for HIV	192 557 (84%)	183 202 (70.7%)	191 333 (64.1%)	192 517 (64.3%)	206 033 (62.5%)
HIV positive	17 384 (9.0%)	19 084 (10.4%)	21 913 (11.3%)	16 243 (8.4%)	16 293 (7.9%)
Co-infected with TB and HIV	2 905 (80.8%)	2 820 (63.2%)	3 063 (72.7%)	2 359 (62.0%)	1 719 (66.6%)
Living with HIV and on ARVs	28 887	24 740	27 272	38 804	39 308
Screened for TB	308 403 (72.9%)	376 718 (80.8%)	422 670 (88.7%)	437 436 (96.0%)	455 242 (96.0%)
Diagnosed with TB	3 593 (1.2%)	4 461 (1.2%)	4 211 (1.0%)	3 799 (0.9%)	2 581 (0.6%)
On TB treatment	3 483	3 999	4 367	3 687	2 414
Diagnosed with MDR-TB	149 (4.1%)	190 (4.3%)	112 (2.7%)	123 (3.2%)	114 (4.4%)
On MDR-TB treatment	172	197	131	133	113
Diagnosed with XDR-TB	11 (0.3%)	18 (0.4%)	14 (0.3%)	13 (0.3%)	12 (0.5%)

# ACTIVITIES OF THE INSPECTORATE





## 5. ACTIVITIES OF THE INSPECTORATE

### 5.1 Regional operations: Central and Coastal Regions

The regional operations consist of the Eastern Cape, Gauteng, KwaZulu-Natal and Northern Cape regions. The major commodities mined are gold, iron, coal, manganese and industrial minerals. Numerous base minerals are also mined and there are large numbers of quarries and borrow pits.

Illegal mining is still a challenge in Gauteng, KwaZulu-Natal, Eastern Cape and Northern Cape. The main commodities affected by illegal mining in the above-mentioned regions are gold, coal, diamonds and sand. The Department has been holding illegal mining combating meetings on a monthly basis to discuss and implement strategies to eradicate illegal mining activities. The Department will continue to collaborate with law enforcement agencies to ultimately eradicate illegal mining activities.

#### Occupational health and safety performance

The Central and Coastal Regions reported a total of 985 diseases in 2017 compared to 1 211 diseases in 2016 and this translates to 19% improvement. There were 23 fatalities in 2017 compared with 26 fatalities in 2016. This indicates an improvement of 12% year-on-year. The number of people injured in 2017 was 702 compared to 863 in 2016. This shows the improvement of 19%.

#### Strategies for improving status-quo

The Central and Coastal Regions will continue to embark on zero tolerance to non-compliance through the implementation of the Occupational Health and Safety (OHS) Improvement Strategy Action Plan. This will be achieved through the following:

- Continued enforcement measures to ensure compliance through issuance of sections 54, 55 and administrative fines in terms of the MHSA.
- Recommendation to suspend or cancel of certificate of competency in line with Chapter 29 regulations in force in terms schedule 4 of the MHSA.
- Convening meetings with company CEOs and various stakeholder leadership to ensure that health and safety strategies are implemented.
- Ensuring that mines improve the process of declaring working places to be safe before work commences.
- Ensuring that mines implements stop, fix, verify and continue procedure.
- Ensuring that mines prevents over exposure to airborne pollutants and noise.
- Promoting efforts and initiatives to combat TB and HIV/AIDS.

#### 5.1.1 Eastern Cape

##### 5.1.1.1 Topical issues and matters of interest

#### Illegal mining operations

The incidence of illegal mining continues to spread within the region and in the period in question particularly in the former Transkei area. Inspectors continue facing a threat of violence from perpetrators. Licensed operators have been requested to report illegal operations to their nearest SAPS for further attention.

### 5.1.1.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	325	44
Actual	352	44
Percentage compliance	106	100

### 5.1.1.3 Total accidents reported

Fatal accidents	1
> 14 day accidents	3
1 to 13 day reportable accidents	7

### 5.1.1.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	3	1	4
Completed	3	1	4
Percentage completed	100	100	100

### 5.1.1.5 Disaster-type accidents

No disaster type accidents were reported.

### 5.1.1.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
7	83

### 5.1.1.7 Administrative fines

Number of fines recommended by Inspector	None
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### 5.1.1.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	7	7	100
Mining and prospecting rights	16	16	100
Closure certificates	17	17	100
Environmental management	41	41	100
Complaints	0	0	100

### 5.1.1.9 Strategies adopted for improving status-quo

Regional tripartite forums are held quarterly where mine employers, the Chamber of Mines, unions and safety personnel meet at different locations in the Eastern Cape to discuss matters of mutual interest. Newsletters are also circulated quarterly.

Audits conducted through the year continue to identify where employers need to focus attention and inspections are geared to follow up on problems identified during group audits. In order to improve the health and safety performance at mines the following aspects will continue to receive more focused attention:

- Milestone targets.
- New legislation and Codes of Practice.
- Statutory appointments.
- Guarding of machinery.
- Safety berms at quarry crests.
- Medical surveillance and AMRs.
- Updating of Mine Plans.
- Investigation of occupational diseases.
- Compliance with quarterly reporting on hygiene measurements.
- Implementation of integrated HIV and TB programmes.

### 5.1.2 Gauteng

#### 5.1.2.1 Topical issues and matters of interest

##### Rising water in the Witwatersrand compartments

Pumping of water from the mine voids in the Central Basin, which extends from Roodepoort to Boksburg, continues. Two submersible pumps are operating at a pumping at a rate of 72 mega litres per day. Pumping of water from the mine voids in the Western Basin, which extends from Krugersdorp to Carletonville, continues. The water treatment plant on the old Randfontein Estates Gold Mine is currently treating approximately 30 mega litres per day.

##### Illegal mining

The illegal mining activities of gold continue to be a major problem for the region, particularly in the East Rand and West Rand. The DMR continues to seal open shafts and holings in derelict and ownerless mines. The Gauteng Illegal Mining Stakeholder Forum chaired by the DMR continues to meet on a monthly basis to implement strategies to combat illegal mining activities. The DMR will continue to collaborate with law enforcement agencies and other stakeholders to ensure to implement the strategies to combat illegal mining activities.

#### 5.1.2.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	1 040	44
Actual	1 161	56
Percentage compliance	112	127

#### 5.1.2.3 Total accidents reported

Fatal accidents	21
> 14 day accidents	592
1 to 13 day reportable accidents	282

#### 5.1.2.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	3	5	8
Completed	3	5	8
Percentage completed	100	100	100

#### Disaster-type accidents

On Friday, 25 August 2017 at approximately 10h28, five employees were fatally injured and one employee was seriously injured as a result of a fall of ground caused by a 1.3 magnitude seismic event at 102 43 West 10 up-dip working place.

#### 5.1.2.5 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
199	176

#### 5.1.2.6 Administrative fines

Number of fines recommended by Inspector	None
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#### 5.1.2.7 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	89	89	100
Mining and prospecting rights	91	91	100
Closure certificates	20	20	100
Environmental management	20	20	100
Complaints	3	2	67

#### 5.1.2.8 Strategies adopted for improving status-quo

- Implementation of strategies that are focusing on seismicity, falls of ground, over exposure to airborne pollutants and noise, rail bound equipment, TMMs, conveyor belts, underground fires and scraper and mono winches.
- Increased interaction between inspectors, mine management and unions.
- Training of workplace health and safety representatives.
- Implementation of safe declaration after charging up and before initiation of blast.
- Monitoring of the implementation of the stop, fix, verify and continue procedure.
- Monitoring of the implementation of a no-go procedure.

### 5.1.3 KwaZulu-Natal

#### 5.1.3.1 Topical issues and matters of interest

The quarry industry's belief is that the Act governing the mines is onerous and should only be applicable to large operations and this is still posing risks to the employees in these operations. A low-level in operational skills of mining related issues and limited understanding of the application of the act further increases risks in the sector. A programme of increasing the safety and health awareness with mine visits, tripartite meetings

and best practice is increasing the standards in these operations.

#### 5.1.3.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	400	44
Actual	599	47
Percentage compliance	150	107

#### 5.1.3.3 Total accidents reported

Fatal accidents	0
> 14 day accidents	20
1 to 13 day reportable accidents	11

#### 5.1.3.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	1	0	1
Completed	1	0	1
Percentage completed	100	N/A	100

#### 5.1.3.5 Disaster-type accidents

No disaster type accidents were reported.

#### 5.1.3.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
42	132

#### 5.1.3.7 Administrative fines

Number of fines recommended by Inspector	12
Value of fines recommended by Inspector	R95 000
Number of fines set aside by Principal Inspector	10
Value of fines set aside by Principal Inspector	N/A
Number of fines imposed by Principal Inspector	2
Value of fines imposed by Principal Inspector	R95 000
Appeals	0
Value of fines paid	R95 000

#### 5.1.3.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	6	6	100
Mining and prospecting rights	47	47	100
Closure certificates	0	0	N/A
Environmental management	0	0	N/A
Complaints	3	3	100

### 5.1.3.9 Strategies adopted for improving status-quo

- Continuation of the strategy of a zero tolerance to non-compliance with our action plans and enforcement of both the act and milestones as set in the mining summit in November 2014.
- More effective use of the administrative fines process applied to ensure compliance.
- Construction projects, underground mines and the large heavy mineral sand mining remain our focus and high priority mines for audit and inspections purposes.
- Continued cooperation between mine employers, mine employees, communities affected by mining operations and Inspectorate is encouraged through regional tripartite forums. This is to ensure that there are effective and efficient strategies to deal with health and safety relating to mining operations in the region.
- Withdrawal of legal appointments and certificates of competencies in cases where gross negligence has been identified will continue.
- The region's focus areas will be set on the issues that continue to affect the health and safety of the employees in the region.

### 5.1.4 Northern Cape

#### 5.1.4.1 Topical issues and matters of interest

Due to commodity prices rising, new small-scale mines are being opened, old operations are being re-opened and some are also treating the dumps. Many of these do inform the Mine Health and Safety Inspectorate of their existence and request for inspections as per the new strategy; however, some operations do hide away until a major accident occurs. During 2017, four amputations were recorded, and it was at those operations that chose not to inform the Inspectorate of their existence. A strategy has since been developed whereby neighbouring mines alert the Inspectorate should they note mining activities adjacent to their operations.

#### 5.1.4.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	560	44
Actual	509	59
Percentage compliance	91	134

#### 5.1.4.3 Total accidents reported

Fatal accidents	1
> 14 day accidents	87
1 to 13 day reportable accidents	190

#### 5.1.4.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	11	1	12
Completed	11	1	12
Percentage completed	100	100	100

#### 5.1.4.5 Disaster-type accidents

No disaster type accidents were reported.

#### 5.1.4.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
12	2

#### 5.1.4.7 Administrative fines

Number of fines recommended by Inspector	None
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#### 5.1.4.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	0	0	N/A
Mining and prospecting rights	220	220	100
Closure certificates	29	29	100
Environmental management	1	1	100
Complaints	4	4	100

#### 5.1.4.9 Strategies adopted for improving status-quo

This year, the main focus is on correct training and wellness of employees. CEOs and owners are still encouraged to present risk management plans during change management. CEOs are also encouraged to present their safety systems to the office with a respective Mine Health and Safety Committee.

Workshops will continue to be held with all mines to discuss accident investigation findings, inspections, legal obligations and responsibilities. The first one this year was termed “Towards Zero Harm” based on the realisation that more needs to be done to encourage employees to stay alert at all times. Focus will still be on physical conditions, the quality of investigations, safe operation procedures, specific training as well supervision.

Occupational hygiene and health contributors to poor health and safety records are a priority. Equipment safety, inclusive of ergonomics, is prioritised. Contribution of consultants to inadequate risk management is still also being prioritised. Focus is more on the implementation of the Codes of Practices. Focus will also be on suppliers and other people affected by operations, but not actively involved.

## 5.2 Regional Operations: Central and North-Eastern Regions

### Overview

The Chief Directorate: Central and Northern Regions consists of the Free State, Limpopo and Mpumalanga regions. The major commodities mined are coal, platinum, gold, copper and industrial minerals. Numerous base minerals are also mined and there are crushers, quarries and borrow pits.

The total number of employees in the Central and North-Eastern Regions was 157 211 in 2017. There was a 3% increase when compared to labour figures of 2016.

During the period under review, the above three regional offices conducted 3 551 routine mine inspections and 150 planned mine audits.

As part of the enforcement measures taken during following the inspections and audits conducted, 323 notices were issued in terms of Section 54 of the MHSA and 434 notices were issued in terms of Section 55 of the MHSA. The notices issued under Section 54 of the MHSA deal with dangerous conditions at mines, while those orders issued in terms of Section 55 of the MHSA order compliance to the provisions of the MHSA.

A total of 28 fatal accidents occurred during the period under review. This translates to a decrease of 47% when compared to the 19 fatal accidents that were reported in 2016. A total of 997 injuries were reported in 2017 which translates to an increase of 18% when compared to the 845 injuries reported in 2016.

In dealing with the above fatal and injury accidents, the Central and Northern region completed 13 fatal inquiries and 504 mine accident investigations during the period under review. The outstanding mine accident inquiries and investigations were due to the unavailability of legal representatives and employer postponements.

### **Topical issues and matters of interest**

On 31 January 2018, a near-disastrous incident occurred at the Sibanye-Stillwater Gold Mine Beatrix 3 shaft following a power failure caused by a severe storm the previous night. More than 900 lives of employees were put at risk for approximately 36 hours as they were trapped underground due to failed attempts by the mine's emergency generators to run the winders.

Fortunately, the electricity was restored by Eskom and all employees were brought safely to surface and no serious injuries besides health-related issues were reported.

### **Illegal mining**

The Mpumalanga and Free State regions have established mining stakeholder forums comprising DMR, the Department of Home Affairs, the Department of Justice and Constitutional Development, SAPS, the Directorate: Priority Crime Investigation (Hawks) Crime Intelligence, the State Security Agency, local municipalities and mining companies.

Illegal mining remains a challenge based on the activities reported.

### **Occupational safety**

It is regrettable that 29 persons lost their lives in mines in the three regions in the Chief Directorate in 2017, compared with 19 lives lost in 2016. Mpumalanga and Limpopo reported a regression of 100% and 333%, respectively. Only Free State registered a decrease in fatalities of 17%. Analysis of the accident statistics for these regions indicated that major contributors to these are were FOG and TMM related.

In 2017, there were 645 injuries compared with 600 injuries reported in 2016. This corresponds to an increase of 7.5%. The general contributions to these were FOG, slips and falls and TMM.

### **Strategies adopted for improving status-quo**

The MHSI will increase visibility at the mines as a proactive measure to enforce compliance at the mines. The strategy will focus on increased inspection, audits and investigations with aim of revealing the system failures in terms of the MHSA and where applicable appropriate enforcement action will be taken if necessary.



## 5.2.1 Free State

The Free State region has two major gold mining companies, namely Harmony Gold and Sibanye-Stillwater. There are two coal mines, four diamond mines and the rest are small scale mines. Commodities that are mined are gold, coal, diamonds, aggregates, sand and bentonite. Gold is still the major commodity being mined. The total labour force in the region is about 34 770 and 29 370 of these employees are in the gold sector.

There was a 28,6% improvement in fatalities, from 14 in 2016 to 10 in 2017 and a 5,7% decrease in reportable accidents from 280 in 2016 to 264 in 2017. Most accidents were as a result of falls of ground, rolling rock and machinery. There has been a 10,4% improvement noted from health incidents reported in 2017 at 674 compared to 752 in 2016.

The submission of occupational hygiene returns has improved from 43 in 2016 to 45 in 2017. However, there was a marginal regression in terms of the submission of AMRs from 48 in 2016 to 45 in 2017. Medical separations are still experienced in the region due to silicosis, though there has been an overall reduction in occupational diseases reported.

The TB, HIV and AIDS policies have been implemented by all bigger mines with an exception of a few smaller ones. Challenges are experienced with deaths of employees due to non-occupational related diseases, though there has been a huge reduction from previous years.

### 5.2.1.1 Topical issues and matters of interest

Between 31 January and 2 February 2018, more than 1 000 mine employees were trapped underground at Sibanye-Stillwater Beatrix 3 shaft for more than 16 hours after a heavy storm damaged Eskom power lines resulting in electrical power outage at Joel mine, Beatrix 1, 3 and 4 shafts.

The emergency diesel generators for the winders to pull out people with a cage in case of emergency failed. After the incident and the subsequent investigation, it was discovered that the emergency preparedness for this kind of situation was lacking and Codes of Practice had to be reviewed to cater for all eventualities. Fortunately, all employees were safely brought to surface after power was restored by Eskom.

The World AIDS day was held in the region and mines held their individual ones on site. These events were attended by surrounding community residents and other stakeholders. Voluntary on-site counselling and testing was conducted. TB, HIV, Silicosis and other health problems remain a serious challenge in the region. Programmes have been put in place for voluntary counselling and testing for HIV and TB in the mines' medical hubs.

Illegal mining activities have unfortunately continued in the region; mostly in the old shafts of Harmony Gold. These old shafts are interconnected but the shaft entrances are filled with rubble and slime which from time to time are broken into by illegal miners in order to gain access to the underground workings of the mines.

On average, four dead illegal miners are retrieved monthly due to gassing, illnesses and gang violence. An average of a hundred illegal miners are arrested monthly as they come from underground. Mine rehabilitation and closure of these old shafts continues.

More than eight old shafts have been filled with to the brim with rubble and slime to prevent unlawful access to the underground workings at Harmony Gold. The number of underground methane explosions has reduced translating into fewer numbers of fatalities because of methane explosions. More than 1 000 illegal miners were arrested in the 2017/2018 period but, unfortunately, a few died before arrest. The regional tripartite forum is still going strong with excellent attendance by all stakeholders.

The Women-in-Mining (WIM) sub-committee has been established in the region.

Joint explosive audits have been conducted at various mines with members of the SAPS.

#### Challenges

No illegal mining stakeholder forum meetings were held in 2017/2018 period in the region as a result of safety and security concerns for the forum members, the meetings were held in other regions.

There was a slight decrease in illegal mining activities in the region but the situation remains dire as more mineworkers lost their jobs. The hotspots for illegal mining are around Welkom, Odendaalrus, and Virginia areas. Disruptive operations by SAPS and security personnel are conducted on regular basis.

The open mine shafts and mine dumps are used by illegal miners for access and transportation of food and water to the underground workings. The biggest challenge is that access for illegal miners and access for their material is often through the help of mine employees themselves.

The rehabilitation and sealing of the shafts is in progress, however, the other unused shafts cannot be closed or sealed as they serve as ventilation shafts and are also used for pumping out underground water.

#### 5.2.1.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	1 440	48
Actual	997	51
Percentage compliance	69	106

The target could not be attained because of capacity challenges caused by the retirement of Inspectors of Mines.

#### 5.2.1.3 Total accidents reported

Fatal accidents	10
> 14 day accidents	264
1 to 13 day reportable accidents	53

The biggest challenge in the region remains injuries and fatalities resulting from falls of ground and rolling rocks. From audits and inspections conducted revealed repeat non-adherence to mine support standards, codes of practice and declaration of unsafe working places as safe.

Non-adherence to ventilation standards results in hot working places although there has been a decreased number of heat related medical cases.

Rail bound equipment non-conformances have also been noted.

#### 5.2.1.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	295	11	306
Completed	271	8	279
Percentage completed	92	73	91

The turn-around times on investigations and inquiries have improved.

### 5.2.1.5 Disaster-type accidents

No disaster type accidents were reported.

### 5.2.1.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
106	189

Most enforcement instructions were issued for non-compliances to Codes of Practice and mine standards both in mining, mine machinery, occupational hygiene and occupational medicine sub-directorates.

### 5.2.1.7 Administrative fines

Number of fines recommended by Inspector	0
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### 5.2.1.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	18	18	100
Mining and prospecting rights	105	105	100
Closure certificates	53	52	99
Environmental management	61	61	100
Complaints	51	51	100

### 5.2.1.9 Strategies adopted for improving status-quo

- Monthly regional tripartite stakeholder forums and robust engagements
- MOSH initiative - continuation of in-stope roof bolting and netting.
- MOSH initiative - use of winch covers for dust.
- Continued intensified inspections and audits by inspectors.
- Enforcement and monitoring of occupational hygiene and medicine programmes through auditing and inspections.
- Participating in working groups to monitor and mitigate occupational diseases.
- Close partnerships with other government departments, trade unions and other key stakeholders.
- Auditing of health and safety management systems and the implementation thereof.
- Quarterly workshops on health and safety with key stakeholders.
- Issuing of the relevant statutory instructions.

## 5.2.2 Limpopo

Limpopo region is situated between Gauteng province in the south, Zimbabwe in the north, Mozambique in the east, Mpumalanga province in the south east, Botswana border in the west and North-West province in the south west.

A wide variety of minerals are mined in this region with platinum, coal and copper being the main commodities. Also, numerous base metals are mined and there is a large number of crushers, quarries, brickworks and borrow pits in the region.

### 5.2.2.1 Topical issues and matters of interest

Venetia mine is currently busy with excavation work to extend operations at the mine underground, which will see it have two vertical shafts, each 7 metres in diameter, sunk to a depth of 1,080 metres. During its lifetime, the mine is expected to treat about 132 million tonnes of ore containing an estimated 94 million carats. The life of the mine is expected to be extended to 2046.

The above project is the biggest single investment in South African mining industry in recent times. The socio-economic benefits include 1 500 jobs being supported during construction phase.

Ivanplats' Platreef Project's Shaft 1 has reached a depth of 750 metres below surface, now less than 40 metres above the Flatreef mineralized zone and more than 75% to the planned final depth of 980 metres. The 750-metre station on Shaft 1 will provide initial, underground access to the high-grade orebody, enabling mine development to proceed during the construction of Shaft 2, which will become the mine's main production shaft.

The 7.25 metre diameter Shaft 1 will be used for initial access to the Flatreef deposit and early underground development.

Furthermore, early-works surface construction for Shaft 2 began in May 2017 with initial curtain grouting around the box cut. Excavation of a surface box cut to a depth of approximately 29 metres will begin early in 2018. The early-works construction is expected to be completed around the end of 2018.

The existing Grootegeluk 2 (GG2) plant historically produced power station coal. The mine project will convert the single-stage beneficiation plant to a new double-phase beneficiation plant, namely Grootegeluk 6 (GG6). Technical alterations at the plant consist of:

- A new Small Coal Beneficiation Plant (SCP), enabling the processing of fragments of less than 10mm
- Improving fines plant beneficiation processes through the use of reflux classifier technology.
- A dewatering plant and ancillaries.
- Expansion of the current stockyard.

With production at the site expected to commence in 2020, the new GG6 plant will enable an additional 600 tonnes per hour of throughput on the ROM feed, as well as higher, more valuable yields through enhanced operational efficiencies and better beneficiation processes. Construction on the project began in quarter two of 2017, and is expected to be completed by quarter two of 2020.

### 5.2.2.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	1 040	44
Actual	1 051	48
Percentage compliance	101	109

### 5.2.2.3 Total accidents reported

Fatal accidents	6
> 14 day accidents	203
1 to 13 day reportable accidents	225

There were six fatalities reported during the period 1 January 2017 to 31 December 2017, compared with four fatalities reported during the same period in 2016. Also, there has been an increase in the number of reportable accidents where 203 injuries were reported during 2017 compared to 135 reported during 2016. An increase in the number of reportable accidents is attributed to mines beginning to report accidents as required in the regulations.

There has been an improvement in the reporting of occupational health issues. The most common occupational diseases reported on in the AMRs for the year 2017 were NIHL, PTB and COAD.

#### 5.2.2.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	82	6	88
Completed	82	2	84
Percentage completed	100	33	96

#### 5.2.2.5 Disaster-type accidents

No disaster type accidents were reported.

#### 5.2.2.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
132	201

Inspectors continue to encounter poor compliance to mine standards and procedures in the working places. This remains a serious concern as it reflects on the level of discipline by employees and mine management at the mines. The challenge ahead is to revive a safe working culture amongst employees and mine management in order for the region to achieve Zero Harm” ideal.

The MHSa sections 54 and 55 instructions were issued on issues relating to:

- Early entry examinations poorly conducted.
- Sub-standard support in face areas, brows, cubbies and working under unsupported hanging.
- Poor use of safety declaration books/unsafe areas declared safe.
- Poor water control in stopes.
- Poor management and control of explosives/lack of explosive procedures.
- Drilling closer to sockets.
- Sub-standard winch installation (rigging, guarding, locking out, signaling arrangements not installed along scraper path).
- Sub-standard conveyor belt installation (trip wires, signaling system, fire suppression, guarding).
- Uncontrolled lifting equipment.
- Keys control system not in place.
- Accumulation of broken ore restricting flow of air in panels.
- Ventilation holings not effected.

- Recirculation of ventilation in development ends.
- Dust suppression systems inadequate.
- Safety officer's and rock engineer's reports disregarded.
- System of medical surveillance not fully implemented.
- Poor housekeeping.

Most MHSA section 54 instructions issued resulted in working places or activities or equipment being stopped until remedial measures were put in place and presented to the Office of the Principal Inspector of Mines.

#### 5.2.2.7 Administrative fines

Number of fines recommended by Inspector	0
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#### 5.2.2.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	28	28	100
Mining and prospecting rights	73	72	98
Closure certificates	26	25	96
Environmental management	8	8	100
Complaints	15	9	60

Closure Certificate applications remain a concern as stakeholders are usually not available to conduct the necessary closure inspections within 30 days.

#### 5.2.2.9 Strategies adopted for improving status-quo

The strategy is to conduct purposeful inspections which reveal any failure in the mine's health and safety systems and taking the appropriate action when necessary. The region believes that the visibility of inspectors, through regular inspections and audits, is a pro-active way to assist mines to comply with health and safety systems to achieve "Zero Harm" ideal.

The region will continue to engage and support mines on their respective health and safety strategies and initiatives. Also, the region will strive for co-operation with mine employers, mine employees, communities affected by mining operations to ensure that there are effective and efficient ways to deal with mine health and safety challenges.

The MHSI will continue to convene meetings with company CEOs and other stakeholder leadership where there is no improvement with regards to safety and health performance.

Mines are encouraged to continue developing and implementing strategies to deal with occupational diseases. The MHSI continues to support efforts and initiatives to combat TB-HIV/Aids through various interventions.

### 5.2.3 Mpumalanga

The Mpumalanga region is surrounded by a number of provinces such as Gauteng, KwaZulu-Natal, Free State and Limpopo, including neighbouring countries, Mozambique and Swaziland. A wide variety of minerals are mined in the Mpumalanga region, with coal as the main commodity mined and there are large number of brickworks, crushers and quarries in the region.

### 5.2.3.1 Topical issues and matters of interest

During the reporting period a number of mines in the region were operating in close proximity to the hosting communities. Some of these mines were conducting blasting operations within 500 metres to the communities without a permission granted in terms of Chapter 4 of the MHSA, as amended.

Some community members lodged complaints to the Department about mines exposing them to excessive noise, dust, blast vibrations and cracked houses as a result of mining operations.

Mine employers were advised to apply for permission to conduct blasting operation within 500 metres from structures to be protected. The applications requirements includes amongst others, a copy of risk assessment, copy of a signed mine plan and proof of consultation with the affected stakeholders.

### 5.2.3.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	1 120	44
Actual	1 503	51
Percentage compliance	134	116

### 5.2.3.3 Total accidents reported

Fatal accidents	12
> 14 day accidents	220
1 to 13 day reportable accidents	32

### 5.2.3.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	154	7	161
Completed	151	3	154
Percentage completed	98	43	96

### 5.2.3.5 Disaster-type accidents

No disaster type accidents were reported.

### 5.2.3.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
85	44

### 5.2.3.7 Administrative fines

Number of fines recommended by Inspector	0
--	---

## Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	18	18	100
Mining and prospecting rights	393	393	100
Closure certificates	4	4	100
Environmental management	2	2	100
Complaints	4	3	75

### 5.2.3.8 Strategies adopted for improving status-quo

Compliance information, regional challenges and areas of excellence are shared at the regional tripartite forums. The region identified that general accidents are still a major contributor of reportable accidents. A high number of falls of ground accidents particularly at coal mines is still a great concern.

The Inspectorate will increase visibility at the mines as a proactive way of enforcing compliance at the mines. Focused inspections, audits and investigations will be conducted with the aim of revealing system failures in terms of mine health and safety. Appropriate enforcement actions are taken if necessary.

The activities of regional Inspectorate will focus on the prevention of falls of ground accidents and slope failures, transport in mining and machinery related accidents, with the emphasis on the enforcement of the new regulations and the implementation of new Codes of Practice, house-keeping and material handling.

It has been noted with concern that some mines do not have integrated TB and HIV/AIDS programmes. Mines are encouraged to have such programmes in place. The on-site wellness programmes remain a challenge to the small mines. These mines are encouraged to use the local municipal clinic where possible. Occupational diseases are still reported in high numbers, but most of these employees reported having been working in the mining industry for the past 20 years or more. Mines are encouraged, as per the 2024 MHSC occupational health milestones, to improve the current preventive measures.

Mines are audited on the implementation of Codes of Practice. Employees working without having undergone initial and periodic medical surveillance will be withdrawn from workings and appropriate action will be taken against employers. The Inspectorate will endeavour to ensure that mines put strategies in place to curb the increasing number of cases of TB amongst employees in the region.

In terms of exposure to airborne pollutants and noise, there is still a sizeable number of employees who are still exposed to HEG A and HEG B, these employees will be withdrawn from such areas. Mines are encouraged to implement strategies to reduce over-exposure to noise and airborne pollutants.

## 5.3 Regional Operations: Western Region

### Overview

The Chief Directorate: Western region consists of Western Cape, North-West: Klerksdorp and North-West: Rustenburg regions. A wide variety of minerals are mined in this region, with the majority of the commodities being PGMs, chrome, gold, diamonds, granite, dimension stones, sand and aggregates. The mining activities are conducted on the surface, underground and offshore.

The total number of employees in the Western Region is about 163 791 which is equivalent to 37% of all employees in South African mines during 2017.



During the period under review, the above three regional offices conducted 2 707 routine mine inspections and 171 planned mine audits.

As part of the enforcement measures taken during following the inspections and audits conducted, 296 notices were issued in terms of Section 54 of the MHSA and 641 notices were issued in terms of Section 55 of the MHSA. The notices issued under Section 54 of the MHSA deal with dangerous conditions at mines, while those orders issued in terms of Section 55 of the MHSA order compliance to the provisions of the MHSA.

A total of 33 fatal accidents occurred during the period under review. This translates to an increase of about 18% when compared to the 28 fatal accidents that were reported in 2016. A total of 1 979 injuries were reported in 2017 which translates to a 6% decrease when compared to the 2 104 injuries reported in 2016.

In dealing with the above fatal and injury accidents, the Western Region completed 22 fatal inquiries and 82 mine accident investigations during the period under review. The outstanding mine accident inquiries and investigations were due to the unavailability of legal representatives and employer postponements.

### **Topical issues and matters of interest**

#### *FOG mine disaster at Tau Lekoa Gold Mine*

A mine disaster is a single event that results in the death of four or more employees. On 22 July 2017, Tau Lekoa Gold Mine in Klerksdorp reported a mine disaster as a result of a seismic induced fall of ground. The said FOG mine disaster fatally injured four mine employees on the spot.

On 23 October 2017 AngloGoldAshanti - Kopanang Mine reported two mine fatalities as a result of a gravity induced FOG mine accident.

Preliminary investigations of the above mine accidents suggests that due lack of safe mineable ground, the gold mines are resorting to pillar mining without a comprehensive risk management plans. Unmined underground pillars are prone to seismicity due to the accumulated stresses and are likely to have a high number of falls of ground.

#### *Challenges*

- More medical deaths have been reported where employees would collapse and pass away at their working places. Some of these employees were mine contractors who did not have proper access to mine's medical facilities.
- FOG and machinery-related accidents were the main contributors of the serious injuries and fatalities. Some mining companies are running out of virgin ground for mining as they are approaching their end of life and are resorting to mining isolated blocks of ground which are prone to high levels of seismicity.

#### *Strategies adopted for improving status-quo*

The MHSI will increase visibly at the mines as a proactive measure to enforce compliance.

More frequent and purposeful routine inspections and audits will be conducted at high risk mines mining pillars and mines which have reported a high number of mine accidents or occupational diseases.

### 5.3.1 North West: Klerksdorp

North-West: Klerksdorp region is surrounded by Free State, Gauteng and Northern Cape provinces. Gold is predominantly being mined in underground mines which are still labour intensive.

Most of the mines in the region are surface diamond diggings around Wolmaransstad, Bloemhof, Schweizer-Reneke, Vryburg, Taung, Ottosdal and Christiana areas. Other minerals that are being exploited in the region include uranium, limestone, fluorspar, sand and clay etc. which are commonly exploited with less labour intensive surface operations.

#### 5.3.1.1 Topical issues and matters of interest

During the reporting period the region has seen a change of ownership at two gold mining companies.

- Village Main Reef Limited and Heaven Sent Capital South Africa acquired Kopanang Gold Mine from AngloGoldAshanti in 2017/2018.
- Harmony Gold Mining Company Limited acquired Moab Khotsong Gold Mine AngloGoldAshanti in 2018.

#### 5.3.1.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	720	44
Actual	888	48
Percentage compliance	123	109

#### 5.3.1.3 Total accidents reported

Fatal accidents	8
> 14 day accidents	193
1 to 13 day reportable accidents	244

#### 5.3.1.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	49	2	51
Completed	49	2	51
Percentage completed	100	100	100

#### 5.3.1.5 Disaster-type accidents

On 22 July 2017, four underground mineworkers were fatally injured in a seismic induced FOG accident at Tau Lekoa Gold mine in Orkney.

#### 5.3.1.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
72	355

### 5.3.1.7 Administrative fines

Number of fines recommended by Inspector	2
Value of fines recommended by Inspector	R0.00
Number of fines set aside by Principal Inspector	2
Value of fines set aside by Principal Inspector	R0.00
Number of fines imposed by Principal Inspector	0
Value of fines imposed by Principal Inspector	R0.00
Appeals	0
Value of fines paid	R0.00

### 5.3.1.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	24	24	100
Mining and prospecting rights	101	101	100
Closure certificates	42	42	100
Environmental management	0	0	0
Complaints	17	17	100

### 5.3.1.9 Strategies adopted for improving status-quo

The following strategies are adopted to improve performance:

- Appropriate statutory instructions are issued to mines, where repeat non-compliances are identified.
- Inspectors are conducting follow-up audits and inspections to monitor progress of action plans presented to the regional office.
- Mines are encouraged to have wellness programmes to address healthy lifestyles and non-occupational diseases including HIV.
- The mines (big and medium operations) conduct wellness campaign in accordance with the South African health awareness calendar.
- Mines are encouraged to deal with lifestyle conditions at the mine hospitals or medical stations for employees who are not on medical aid.
- At some mines employees are questioned and tested on the signs and symptoms of TB whenever they visit the health facility i.e. medical stations, hospital and during health campaigns at different mines.
- During these awareness campaigns mine employees are counselled and with their consent HIV testing is done. It should be noted that this is managed at the primary health care and not at the occupational health centre.

### 5.3.2 North-West: Rustenburg

A wide variety of minerals is being mined in the North West: Rustenburg region with PGMs and chrome being the main commodities. Mining operations in the region are mainly made up of labour intensive underground mining operations with numerous surface slate and granite quarries. The North West: Rustenburg region still accounts for most of the mine employees in the country.

### 5.3.2.1 Topical issues and matters of interest

During the reporting period, the region experienced numerous litigations and appeals against Inspectors of Mines instructions from some mining companies especially from Sibanye-Stillwater.

The region also experienced an increase of copper cable theft in operating and non-operating mines.

Illegal mining activities were reported by some community members and the region also experienced an increase in medical related deaths both on surface and underground mines.

During the month of January 2018, some of Anglo-American owned mines in the Swartklip area were acquired by Siyanda Resources.

### 5.3.2.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	800	44
Actual	1 151	70
Percentage compliance	144	159

### 5.3.2.3 Total accidents reported

Fatal accidents	24
> 14 day accidents	1 081
1 to 13 day reportable accidents	440

24 persons were fatally injured in 23 separate accidents. Most of the fatal accidents were as a result of falls of ground and winch-related accidents.

The 14-day reportable accidents decreased from 1 130 during the previous reporting year to 1 081 in the current year, a 4% marginal improvement.

### 5.3.2.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	24	17	41
Completed	24	20	44
Percentage completed	100	117	107

### 5.3.2.5 Disaster-type accidents

No disaster type accidents were reported.

### 5.3.2.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
220	275

### 5.3.2.7 Administrative fines

Number of fines recommended by Inspector	0
--	---

### 5.3.2.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	N/A		
Mining and prospecting rights	N/A		
Closure certificates	N/A		
Environmental management	N/A		
Complaints	262	252	96

Most complaints received fall under the jurisdiction of the Department of Labour (DOL). Those employees were assisted and referred to the relevant authorities at DOL.

### 5.3.2.9 Strategies adopted for improving status-quo

The following strategies were adopted to improve performance:

- The issuing of un-roadworthy certificates for all TMMs and any other form of moving machinery and placing it under strict supervision of an appointed engineer at the mine.
- Withdrawal of legal appointments for negligent supervisors and instructed not to take any health and safety decisions on behalf of employees.
- Withdrawal of employees in the affected ventilation district in case of any fire at the mine.
- Safety drive carried through inspections and audits based on current challenges identified through accidents and leading indicators.
- Immediate disconnections of electrical power on sub-standard winches during inspections and audits.
- Mines are urged to use additional appropriate support system with overall areal coverage to minimise falls of ground accidents.

## 5.3.3 Western Cape

Most mines in the Western Cape Region are mainly small surface mines and quarries. The other mines are one offshore platform producing gas at Mossel Bay; sea diamonds on the West Coast; limestone for cement and other purposes and then sand, stone and clay for the construction industry. The region also has one small underground mine, Steenkampskraal, which has been dormant for a very long time but may be re-opened depending on international markets for Monozite and other rare earth metals.

### 5.3.3.1 Topical issues and matters of interest

Prospecting for uranium in the Beaufort West area was completed and mining rights were issued for the underground mining of uranium. Activities are expected to start in the next financial year.

The construction of the plant of the Elandsfontein Phosphate Mine in the Langebaan area was completed. Mining commenced but was stopped after problems with the process plant were experienced. The mine is currently on care and maintenance until the production issues can be resolved.

At the last count, the Western Cape Region had about 5 647 employees and contractors working at all the mines. The Western Cape, however, has only seven mines with more than 100 employees.

### 5.3.3.2 Inspections and audits

CATEGORY	INSPECTIONS	AUDITS
Planned	540	30
Actual	668	53
Percentage compliance	124	177

During the last year certain mines were prioritised. The inspection frequency was increased to the extent that a different inspector will visit the mine every month.

At the other mines inspections were planned with the view of maintaining visibility. The planning ensured that each mine was visited at least every five months by an inspector of another discipline. By these inspections the inspectors ensured that all the mines had some form safety management system in place.

Due to the financial restrictions the region discontinued the conducting of two group audits per month. At least two individual audits had to be conducted by the inspectors in their specific disciplines. This allowed the inspectors to prioritise the mines where they experience problems related to their specific discipline.

Inspectors conducted 212 individual audits against the planned 120. The numbers of audits indicated in the table is the individual audits divided by the four disciplines. This is done as a group audit would normally be a combination of the engineering, mining, occupational hygiene and occupational medicine disciplines.

### 5.3.3.3 Total accidents reported

Fatal accidents	1
> 14 day accidents	8
1 to 13 day reportable accidents	13

The region had one fatal accident during 2017 after having no fatal accident in 2016. Unfortunately, two persons died in this accident as a result of asphyxiation in a vessel filled with nitrogen at a petro-chemical plant.

### 5.3.3.4 Investigations and inquiries

	INVESTIGATIONS	INQUIRIES	TOTAL
Initiated	9	0	9
Completed	9	0	9
Percentage completed	100	100	100

### 5.3.3.5 Disaster-type accidents

No disaster type accidents were reported.

### 5.3.3.6 Statutory notices

SECTION 54 NOTICES	SECTION 55 NOTICES
4	11

Four Section 54 notices were issued in which eleven instructions were given and eleven Section 55 notices were issued in which 19 instructions were given.

The majority of the statutory notices were issued for inadequate guarding of machinery, absence of medical surveillance, training and risk management issues.

#### 5.3.3.7 Administrative fines

Number of fines recommended by Inspector	1
Value of fines recommended by Inspector	R 50 000
Number of fines set aside by Principal Inspector	1
Value of fines set aside by Principal Inspector	R 50 000

#### 5.3.3.8 Land-use applications and complaints

	RECEIVED	COMPLETED	PERCENTAGE
Township developments	65	65	100
Mining and prospecting rights	46	46	100
Closure certificates	13	13	100
Environmental management	8	8	100
Complaints	4	4	100

The Municipal Manager of George complained about the local community being exposed to mining hazards. It was established that the exposure was as a result of informal housing illegally being established within one hundred metres from the mine, the community illegally entering the mining area and undermining of old piles of broken bricks.

Two complaints were related to actions taken by an inspector at two different mines.

One other complaint received was related to no change houses being provided at a mine.

All the complaints were amicably resolved.

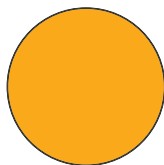
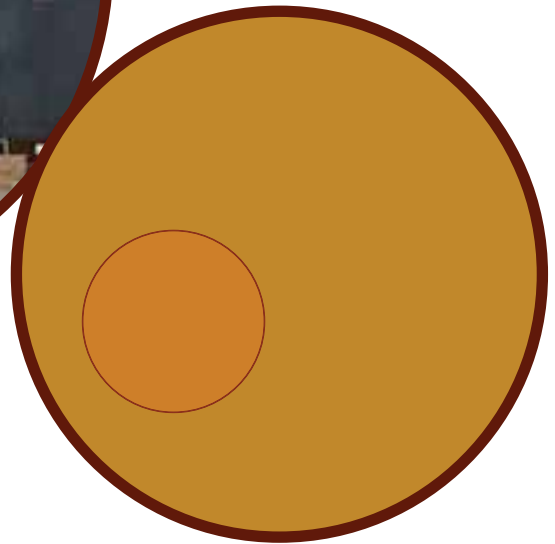
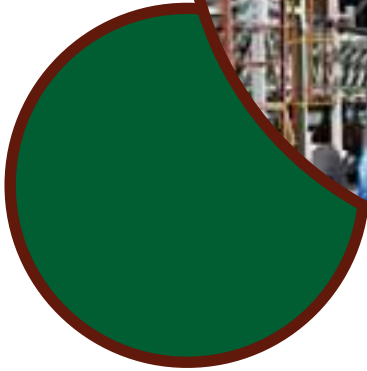
#### 5.3.3.9 Strategies adopted for improving status-quo

Inspectors are continuously motivated to influence the mines to improve the quality and effectiveness of risk management, training and behavior-based safety. The Audit Strategy was changed to do individual audits. Group audits will be done as required on the larger mines and deserving problematic mines.

Although the majority of mines in the Western Cape region are small mines, there is a strong willingness by mine owners and managers in the region to comply with the requirements of the MHSA, as amended. The current legislation, however, is mostly directed to large mines and makes compliance very expensive for small mines. Inspectors are mindful of the National Development Plan and endeavored to assist small mines where possible.

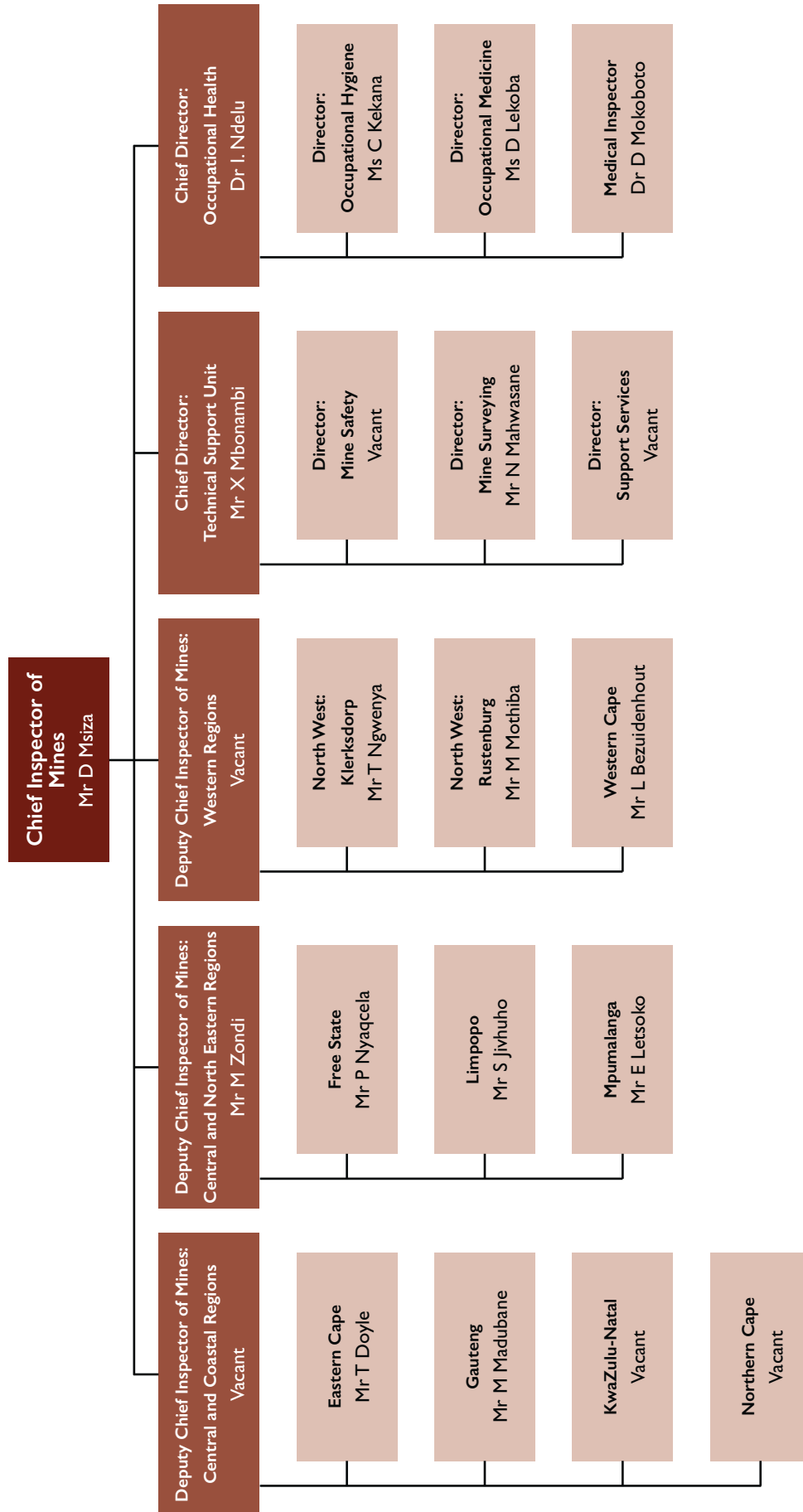
Inspectors of Mines also contributed to a large extent in encouraging owners and managers of mines not just to comply with legislation but to establish a health and safety culture on the mines. Tri-partite meetings with active participation were held at regional scale and were attended by employers, employee representatives and Inspectors of Mines from the Department.

# ANNEXURES





## ANNEXURE A: Organogram of the MHSI for the period ending 31 March 2018



## ANEXURE B: Contact list

POSITION	OFFICIAL	WORK TEL	POSTAL ADDRESS	E-MAIL
Chief Inspector of Mines	Mr D Msiza	012 444 3639 012 444 3970	Private Bag X59 ARCADIA 0007	phumudzo.rambau@dmr.gov.za Sithembile.nzimande@dmr.gov.za
Deputy Chief Inspector of Mines: Central and Eastern Northern Region	Mr MMA Zondi	012 444 3663	Private Bag X59 ARCADIA 0007	lindiwe.sekwati@dmr.gov.za
Deputy Chief Inspector of Mines: Western Region	Vacant	012 444 3661	Private Bag X59 ARCADIA 0007	mokgadi.lesoka@dmr.gov.za
Deputy Chief Inspector of Mines: Central and Coastal Regions	Vacant	012 444 3649	Private Bag X59 ARCADIA 0007	freda.seema@dmr.gov.za
Chief Director: Occupational Health	Dr L Ndelu	012 444 3667	Private Bag X59 ARCADIA 0007	trevia.kungoane@dmr.gov.za
Chief Director: Technical Support Unit	Mr X Mbonambi	012 444 3676	Private Bag X59 ARCADIA 0007	arista.muller@dmr.gov.za
Director: Mine Safety	Vacant	012 444 3612	Private Bag X59 ARCADIA 0007	portia.sokhulu@dmr.gov.za
Medical Inspector	Dr D Mokoboto	012 444 3614	Private Bag X59 ARCADIA 0007	pertunia.makhubela@dmr.gov.za
Director: Occupational Medicine	Ms D Lekoba	012 444 3785	Private Bag X59 ARCADIA 0007	rudzani.moshapo@dmr.gov.za
Director: Occupational Hygiene	Ms CT Kekana	012 444 3646	Private Bag X59 ARCADIA 0007	anesia.matjokane@dmr.gov.za
Director: Mine Health and Safety Legal Services	Mr G Ndamse	012 444 3274	Private Bag X59 ARCADIA 0007	mmasello.maimela@dmr.gov.za
Director: Mine Surveying	Mr NV Mahwasane	012 444 3789	Private Bag X59 ARCADIA 0007	goitsemanng.sekwati@dmr.gov.za
Director: Support Services	Vacant	012 444 3547	Private Bag X59 ARCADIA 0007	daphney.sekgobela@dmr.gov.za
Principal Inspector of Mines: Eastern Cape	Mr TM Doyle	041-4036640	Private Bag X6076 PORT ELIZABETH 6000	megan.singh@dmr.gov.za
Principal Inspector of Mines: Free State	Mr PH Nyaqcela	057 391 1372	Private Bag X33 WELKOM 9460	anna.charley@dmr.gov.za
Principal Inspector of Mines: Gauteng	Mr MN Madubane	011 358 9776	Private Bag X5 BRAAMFONTEIN 2017	nokhaya.magudumana@dmr.gov.za
Principal Inspector of Mines: KwaZulu-Natal	Vacant	031 335 9626	Private Bag X54307 DURBAN 4000	sindy.dlamini@dmr.gov.za
Principal Inspector of Mines: Limpopo	Mr S Jivhuho	015 287 4705	Private Bag X9467 POLOKWANE 0700	nancy.montana@dmr.gov.za
Principal Inspector of Mines: Mpumalanga	Mr E Letsoko	013 653 0537	Private Bag X7279 WITBANK 1035	dumsile.nkosi@dmr.gov.za
Principal Inspector of Mines: Northern Cape	Vacant	053 807 1735	Private Bag X6093 KIMBERLEY 8300	ntsako.sibuyi@dmr.gov.za
Principal Inspector of Mines: North West: Klerksdorp	Mr T Ngwenya	018 487 4316	Private Bag A1 KLERKSDORP 2570	elizabeth.mmota@dmr.gov.za

POSITION	OFFICIAL	WORK TEL	POSTAL ADDRESS	E-MAIL
Principal Inspector of Mines: North West: Rustenburg	Mr H M Mothiba	014 594 9240	P O Box 150 TLHABANE 0309	tintswalo.baloyi@dmr.gov.za
Principal Inspector of Mines: Western Cape	Mr LJA Bezuidenhout	021 427 1004	Private Bag X9 ROGGE BAY 8012	ntombikayise.ntlenzi@dmr.gov.za
Mining Qualifications Authority Chief Executive Officer	Mr T Mmota	011 547 2600	7 Anerley Road Parktown 2193	Rochelle.m@mqa.org.za
Mine Health and Safety Council General Manager	Mr TT Dube	011 656 1797 x 112	Private Bag X11 WENDYWOOD 2144	dndumndum@mhsc.org.za

## ANEXURE C: Acronyms

ADT	Articulated Dump Truck
AIDS	Acquired Immune Deficiency Syndrome
AMDP	Advanced Management Development Programme
AMR	Annual Medical Report
AQI	Air Quality Index
ARV	Antiretroviral
CCMA	Commission for Conciliation, Mediation and Arbitration
CEO	Chief executive officer
CIOM	Chief Inspector of Mines
COAD	Chronic obstructive airways disease
COM	Chamber of Mines (Minerals Council of SA)
COP	Code of Practice
CSM	Cold stress management
CWP	Coal workers' pneumoconiosis
DMR	Department of Mineral Resources
DOL	Department of Labour
FFR	Fatality frequency rate
FOG	Fall of ground
GCC	Government Certificate of Competency
GDI	Gas detection instrument
HCT	HIV counselling and testing
HEG	Homogenous exposure group
HIV	Human Immunodeficiency Virus
HPD	Hearing protection device
HRD	Human Resource Development
IOM	Inspector of Mines
LHD	Load haul dumper
LDV	Light delivery vehicle
MDR-TB	Multi-drug-resistant TB
MHS	Mine health and safety
MHSA	Mine Health and Safety Act, 1996 (Act 29 of 1996), as amended
MHSC	Mine Health and Safety Council
MHSI	Mine Health and Safety Inspectorate
MOSH	Mine Occupational Safety and Health
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002))
MQA	Mining Qualifications Authority
MSCC	Mine Surveyors' Certificate of Competency
NDP	National Development Plan
NIHL	Noise-induced hearing loss
OEL	Occupational exposure limit
OHS	Occupational Health and Safety

<b>OMP</b>	Occupational Medical Practitioner
<b>OREP</b>	Occupational risk exposure profile
<b>PDS</b>	Proximity detection system
<b>PGM</b>	Platinum Group Metals
<b>PI</b>	Principal Inspector of Mines
<b>PLH</b>	Percentage loss of hearing
<b>PTB</b>	Pulmonary tuberculosis
<b>RBE</b>	Rail-bound equipment
<b>RSJ</b>	Rolled steel joist
<b>SAMRASS</b>	South African Mines Reportable Accidents Statistical System
<b>SAPS</b>	South African Police Service
<b>SCP</b>	Small Coal Beneficiation Plant
<b>Sil+TB</b>	Silico-tuberculosis
<b>SLA</b>	Service level agreement
<b>SSA</b>	State Security Agency
<b>T&amp;M</b>	Transportation and mining
<b>TB</b>	Tuberculosis
<b>TMM</b>	Trackless mobile machines
<b>XDR-TB</b>	Extremely drug-resistant TB

# Mine Health and Safety Inspectorate



mineral resources

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