

EXECUTIVE SUMMARY

Ghana Manganese Company (GMC) Limited owns and operates the Nsuta Manganese Mine located in the Tarkwa-Nsuaem Municipal Assembly of the Western Region of Ghana. The mine; which has a 90% private shareholding by Consolidated Minerals Africa Limited (CMAL) Limited and 10% Government of Ghana (GoG), has been in operation for over hundred (100) years and has a total concession area of 175km².

The mining method employed is exclusively open-cast; comprising drilling, blasting, loading and hauling. Thereafter, the ore is processed and stockpiled for transportation by rail and road to Takoradi Port for Shipment. Active mining operations on the concession were concentrated in Pit C in the year under review.

The Annual Environmental Report focuses on the following relevant aspects in accordance with Legislative Instrument 1652.

GMC's POLICY OBJECTIVES, STRATEGIES AND TARGETS

GMC's policy statements with regards to the Environment, Occupational Health and Safety (OHS) and Corporate Social Responsibility (CSR) are critical in achieving our vision of becoming a model mine for Legal Requirements. The objectives outlined below were derived from the policy statements:

- a. Promoting sound Health, Safety and Environmental (HSE) management policies and practices as well as complying with the requirements of relevant legislation (HSE management);
- b. Actively seek to manage the natural and physical resources in an environmentally responsible and sustainable manner while actively seeking to investigate opportunities to enhance the biodiversity on the mine (the natural environment);
- c. Committing to reduce fuel consumption of vehicle fleet and promote the use of environmentally friendly transportation modes (developed environment);
- d. Actively manage the use of energy and utilities and reduce waste by avoidance, reduction, re-use or efficiently using finite resources (use and reuse of natural resources);
- e. Training on sustainability, environmental protection and commitment to health and safety
- f. Emergency response planning for all potential risks on the mine which considers the effects of proposed responses; and
- g. Communicate and consult as appropriate with all relevant stakeholders especially host communities.

Some strategies adopted to meet the above objectives include the following:

- a. Appointment of statutory personnel;
- b. Presenting personnel for varied certificates of competency examination;
- c. NOSA HSE training and baseline assessment;
- d. Environmental monitoring programmes; and
- e. Stakeholder engagement programmes.

The following targets, among others, were set at the beginning of the year:

- a. To ensure that environmental incidents occurring on the mine do not exceed short term environmental (i.e. L2) impacts; explained in the risk matrix as any environmental impact lasting weeks with a reduced area less than a kilometre with no effect on environmentally sensitive species or habitats
- b. To achieve a pass rate of 50% compliance or above, for ambient dust results submitted in the monthly environmental monitoring returns;
- c. To achieve a pass rate of 75% compliance or above, for all other reportable environmental monitoring parameters (i.e. water quality, noise and blast);
- d. To undertake various critical projects as part of the company's Corporate Social Responsibility;
- e. To record a 10% reduction in formal community complaints than was recorded last year;
- f. To have at least 75% of community complaints resolved by the end of the year;
- g. To record no injury category above medical treated injuries;
- h. To see a 10% decrease in the number of incidents recorded on the mine; and
- i. To avoid any HSE related fines.

OPERATIONAL ACTIVITIES AND PRODUCTION DATA

During the year under review, mining operations were focused on Pit C, sections Central West North, Central West, Central East, South East and South West. Manganese Carbonate was the main ore body exploited during the year with the budgeted stripping ratio of 13.31:1 (tonne: tonne).

The total volume of material mined was **41,229,206** tonnes; **92.71%** of which was waste rock (i.e. **38,225,626** tonnes) while the remaining **7.29%** was manganese ore (**3,003,580** tonnes).

A total of **439,967** tonnes of soft waste material was also moved in the year. **95.91%** was during pit development (i.e. **421,967** tonnes) while the remaining **4.09%** occurred during a road diversion project (i.e. **18,000** tonnes). Exploration and infill borehole drilling were also executed in Pits C South East and C Central East.

The total volume of manganese ore crushed at the processing plant was **3,021,633** tonnes; of which **60.40%** was high grade carbonate (i.e. **1,825,197** tonnes), **38.67%** was low grade

carbonate (i.e. **1,168,338** tonnes), and the remaining **0.93%** was carbox material (i.e. **28,098** tonnes).

ENVIRONMENTAL ACTIVITIES FOR THE YEAR UNDER REVIEW

a. Environmental monitoring

Various environmental parameters such as meteorological data (rainfall, temperature and evaporation), water quality, water level readings, dust, noise and blast were monitored.

b. Environmental improvement activities

The following routine environmental improvement activities were undertaken in the year under review:

- i. Routine inspection of parked heavy duty equipment to ensure efficiency of spill containment measures implemented;
- ii. Pit dewatering pumps were inspected frequently to ensure that there was no oil entering water bodies;
- iii. Oil contaminated soil at the volatilization pad was turned fortnightly to speed up the breakdown of hydrocarbon chains;
- iv. Regular inspection of workshops and mine face occurred to ensure that operations were within regulatory standards;
- v. Inspections and audits were conducted by the internal audit team; and
- vi. Completion of volatilization pad demarcation project.

c. Environmental studies

Environmental studies conducted in the year under review included:

- i. Waste dump site investigation;
- ii. Hydrological studies of GMC concession; and
- iii. Flood assessment prediction and hydrological impact assessment of the Tarkwa Bansa Resettlement area.

d. Environmental meetings, programmes and workshops

Environmental meetings, programmes and workshops in the year under review included:

- i. ENSOC meetings; organised quarterly, which served as a platform for members to exchange knowledge and experiences on industry best practices, successes and challenges faced;
- ii. Celebrated World Environment Day on 6th June;
- iii. Organised a NOSA HSE training course and baseline audit; and
- iv. Began training on oil spill prevention, containment and clean-up for workshop supervisors.

CHALLENGES, ACHIEVEMENTS AND FAILURES

a. Challenges

Challenges encountered in the year included:

- i. Dust;
- ii. Oil spills;
- iii. Poor water quality results;
- iv. Uproar by Tarkwa Bansa community members;
- v. Exceedances in blast monitoring values;
- vi. Community complaints; and
- vii. Occupation Health Safety incidents.

b. Achievements

GMC achieved the following milestones in the year under review:

- i. The mine did not record any L2 category environmental incidents or greater;
- ii. The mine exceeded the internally set target of 75% compliance rate for results reported in the monthly environmental monitoring returns for surface water quality, noise and blast;
- iii. Undertook various Corporate Social Responsibility projects including scholarship/bursary awards and community assistance programmes;
- iv. Exceeded the set target to resolve at least 75% complaints by the end of the year;
- v. Undertook numerous staff development or training programmes; and
- vi. The mine received numerous awards relating to HSE.

c. Failures

Set targets that were not achieved at the end of the year included:

- i. Achieved less than the internally set pass rate of 50% for ambient dust monitoring values;
- ii. Increased number of community complaints lodged as compared to 2016;
- iii. Increase in the number of incidents recorded on the mine as compared to 2016;
- iv. Occurrence of injury classifications above medical treated injuries;
- v. Recorded three (3) lost time injuries and one (1) fatality on the mine; and
- vi. The mine received one (1) HSE related fine

With the vision of becoming a model mine with regards to regulatory requirements, it is the desire of the HSE department to address the challenges and failures experienced in the past year while improving on our achievements. Set targets for the coming year (2018) will be geared towards the following focal areas:

- i. Improving the percentage pass rate for ambient dust monitoring values to 50%;
- ii. Improved HSE performance on the mine;
- iii. Reducing the number of community complaints recorded;
- iv. Reducing the number of incidents recorded on the mine;
- v. Ensuring that no injuries above MTI are recorded on the mine; and

- vi. Improving the health and wellness of employees on the mine.

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The General Manager

Ghana Manganese Company Limited

1. INTRODUCTION

Ghana Manganese Company (GMC) Limited owns and operates the Nsuta Manganese Mine, approximately 4km from Tarkwa, in the Tarkwa-Nsuaem Municipality in the Western Region of Ghana. The concession of the company covers a total area of 175km², however GMC's operational activities; including the Nsuta Village, senior staff accommodation, workshops and offices, cover an area of approximately 14.21km² which represents 8.12% of the total concession.

The mine has a 90% private shareholding by Consolidated Minerals Africa Limited (CMAL) Limited and 10% freehold shareholding by the Government of Ghana (GoG).

The mining method employed is exclusively open-cast; comprising drilling, blasting, loading and hauling. Thereafter, the ore is processed (crushed and screened with no chemical addition) and stockpiled for transportation by rail and road to Takoradi Port for shipment. In 2017, GMC's mining operations was focused on Pit C, especially on central-west and the south-western sectors.

The management of GMC remains committed to its vision of becoming a model mine for Regulatory Requirements by ensuring that the company's activities are carried out with due cognizance of the environment, the health and safety of workers and members of adjoining communities.

This report will focus on the following in the year under review:

- GMC Policy objectives, strategies and targets;
- Operational activities and production data;
- Environmental activities undertaken in the year under review; and
- Challenges encountered, achievements and failures;

2. HSEC POLICY OBJECTIVES, STRATEGIES AND TARGETS

2.1 GMC's Policy Statements

The protection of the health and safety of workers and population, as well as safeguarding the environment and property are integral parts of GMC's Health, Safety, Environment and Community (HSEC) culture. Key to achieving our vision of becoming a model mine to Legal

Requirements are our policy statements concerning the Environment, Occupational Health and Safety (OHS) and Corporate Social Responsibility (CSR), as they serve as the company's basic action plan and set a clear direction for the organisation to follow. Furthermore, these policy statements contribute to all aspects of the business performance as part of an obvious commitment to continuous improvement.

Find below the company's Policy Statements:



G.M.C.

Ghana Manganese Company Limited
Environmental Policy Statement

Ghana manganese Company Limited is committed to minimising the potential impact of its mining activities on the environment. We will therefore strive to conduct all our operations in compliance with all relevant environmental legislation and will endeavour to use pollution prevention measures and incorporate environmental best practices in all our operation.

In the light of the above GMC is committed to:

- Co-manage the environment by integrating the consideration of environmental concerns and impacts into all of our decision making and activities,
- Promote environmental awareness among our employees and encourage them to work in an environmentally responsible manner,
- Train, educate and inform our employees about environmental issues that may affect their work,
- Reduce waste through re-use and recycling and by purchasing recycled, recyclable or re-furnished products and materials where these alternatives are available, economical and suitable,
- Promote efficient use of materials and natural resources throughout our facility including water, electricity, raw materials and other resources, particularly those that are non-renewable,
- Avoid unnecessary use of hazardous materials and products, seek substitutions when feasible, and take all reasonable steps to protect human health and the environment when such materials must be used, stored and disposed of,
- Purchase and use environmentally responsible products accordingly,
- Where required by legislation or where significant health, safety or environmental hazards exist, develop and maintain appropriate emergency and spill response programmes,
- Communicate our environmental commitment to our sub contractors and the host communities and encourage them to support it,
- Strive to continually improve our environmental performance and minimise the social impact and damage of activities by periodically reviewing our environmental policy in light of our current and planned future activities.

Jurgen Eijgendaal



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Managing Director
Ghana Manganese Co. Ltd

Figure 2.1: Environmental Policy Statement

G.M.C.

Ghana Manganese Company Limited
Health and Safety Policy Statement

Ghana Manganese Company Limited believes that sound occupational health and safety management practices are in the best interests of its business, employees, and the host communities in which it operates. The company aspires to conduct its mining operations in a manner which ensures the health and safety of its employees and preserves the environment. GMC is committed to operate within the legal framework expectation of the company and guidelines provided by various regulatory bodies. GMC will provide a safe and healthy working environment that meets statutory requirements.

In the light of the above GMC is committed to:

- Provide the expertise and resources needed to maintain safe and healthy working conditions,
- Establish clearly defined occupational health and safety programs and measure safety and health performance, making improvements as warranted,
- Operate in accordance with recognized industry standards, while complying with all applicable regulations,
- Set objectives for accident and incident prevention and planning for continual improvement in health and safety processes, systems and performance,
- Investigate the causes of accidents and incidents and develop effective and immediate preventative and remedial action,
- Ensure that all staff is made aware of their health and safety responsibilities and the consequences of their acts and omissions, through appropriate training, instruction and supervision,
- Maintain a high degree of emergency preparedness,
- Require that visitors and contractors comply with all applicable health and safety standards.

Jurgen Eijgendaal


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Managing Director
Ghana Manganese Co. Ltd.

Fig 2.2: Health and Safety Policy Statement

G.M.C.

Ghana Manganese Company Limited
Corporate Social Responsibility Policy Statement

Ghana Manganese Company Limited is committed in its corporate social responsibility policy to identify the requirements of all stakeholders with particular emphasis on communities within the company's catchments area and, other external organizations and individuals, by maintaining and building strong relationships based on mutual respect and recognition of each other's rights, together with an active partnership and long term commitment to the betterment of the company's operations.

In the light of the above GMC is committed to:

- Engage in accurate, transparent and timely constructive dialogue with all the employees, community leaders and other stakeholders to share information and listen to their concerns and expectations relating to new projects, ongoing operations and future closure,
- Ensure that the company's staff and management is committed to creating a culture that makes community relations an integral part of the short and long term operations and performance of the managerial systems,
- Undertake and review sustainable alternative livelihood projects, providing infrastructure based projects and granting educational bursaries to provide sustainable social and economic benefits from the mining operations,
- Promote accountability through formal meetings (i.e. Annual General Meetings – AGMs) and documentation to review strategies and progress in achieving the defined outcomes,
- Establish regulated dialogue with all relevant communities through a Council with representation from the communities, chiefs, opinion leaders and local authorities,
- Comply with this vigorous policy statement to conduct operations in an environmentally sustainable manner and ensure that they are demand-driven; profit oriented and have a clear alignment towards poverty alleviation as well as enhancement of the well-being of the people within the communities.

Jurgen Eijgendaal


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Managing Director
Ghana Manganese Co. Ltd.

Fig 2.3: Corporate Social Responsibility Policy Statement

2.2 GMC's Policy Objectives

The objectives outlined below were derived from the company's Environment, OHS and CSR policy statements.

Table 2.1: Policy Objectives

Area/Aspect	Objective
HSE Management	<p>The company aims to promote a clean, safe and healthy environment for workers, visitors and third party contractors. This will be achieved by:</p> <ul style="list-style-type: none"> • Promoting sound HSE management policies and practices; • As a minimum, complying with the requirements of relevant legislation; • Preventing pollution; • Reducing and where practicable preventing incidents; • Adopting strategies and targets for improving HSE performance; and • Ensuring sound understanding of current HSE performance.
The natural environment	<ul style="list-style-type: none"> • Manage the natural and physical resources in an environmentally responsible and sustainable manner; and • Actively seek to investigate opportunities to enhance the biodiversity of areas on the mine.
Developed environment	<ul style="list-style-type: none"> • Commit to reducing fuel consumption of its vehicle fleet where cost effective; and • Promote and support the use of environmentally responsible transportation modes such as carpooling and the use of buses.
Use and re-use of natural resources	<ul style="list-style-type: none"> • Actively manage the use of energy and utilities; • Reduce waste by avoidance, reduction, re-use or efficiently using finite resources where alternatives are not available; • Commit to the procurement and use of sustainable, safe and environmentally friendly resources within the company's financial constraints and where opportunities are available; and • Manage the disposal of consumable resources and other waste streams with environmental sensitivity.
Training	<ul style="list-style-type: none"> • GMC recognises that sustainability, environmental protection and a commitment to health and safety are themes arising in the industry and are increasingly important to the future of the company. The intent is for management and workers to develop an understanding for these issues.
Emergency response	<ul style="list-style-type: none"> • GMC's emergency response planning will address all potential risks on the mine; and • Emergency response shall consider the effects of proposed responses and minimise those effects if possible.
Community/stakeholder	<ul style="list-style-type: none"> • GMC will communicate and consult as appropriate with all

consultation	<p>relevant stakeholders especially host communities, on HSE issues; and</p> <ul style="list-style-type: none"> • Promoting itself as an health, safety and environmentally responsible company.
Procurement	<ul style="list-style-type: none"> • To work with suppliers to promote sustainable resource management practices; and • To promote life cycle considerations in the procurement of goods and services.

2.3 Strategies Adopted

Some strategies adopted by the company to meet the above objectives included:

2.3.1 Appointment of statutory personnel

Management employed the following personalities listed in Table 2.2 to occupy statutory positions on the mine site.

Table 2.2: Newly Employed Personnel with Statutory Certificates and Positions appointed to

Name	Statutory Position Appointed To
Ebenezer Eshun	Electrical Superintendent
Luqman Eshun	Mechanical Superintendent
Samuel Eshun	OHS Superintendent
Francis Essel Moses	Mine Maintenance Superintendent (in charge of HD-EME & Light Vehicles

2.3.2 Certification of personnel

The company presented sixty-nine (69) employees for varied Minerals Commission certificates of competency examinations in the year under review as indicated in Figure 2.4.

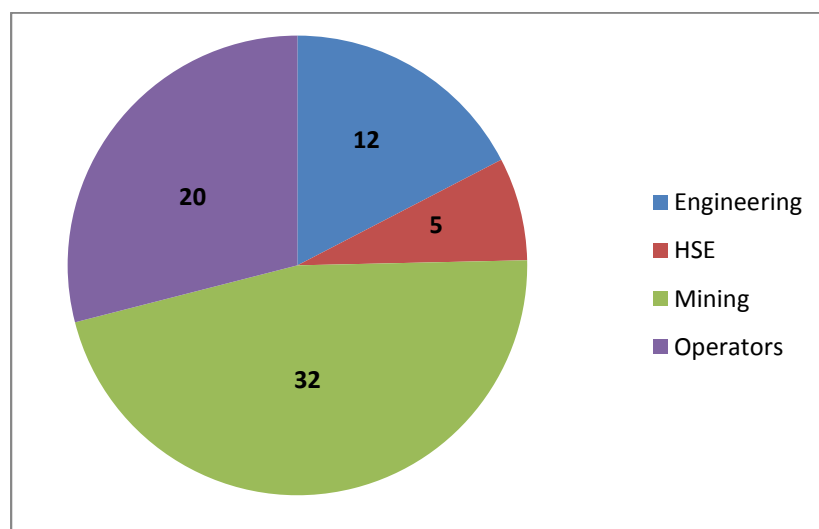


Figure 2.4: Personnel Presented For Certification

2.3.2.1 Engineering

Twelve (12) personnel were presented, of which four (4) were for Inspecting Engineers Certification while the remaining eight (8) were for Sectional Engineers Certification.

2.3.2.2 HSE

Five (5) personnel were presented, of which two (2) were for HSE Officer Certification, one (1) for Senior HSE Officer Certification, while the remaining two (2) were for HSE Superintendent Certification.

2.3.2.3 Mining

Thirty-two (32) personnel were presented, of which twenty-one (21) were for Blasting Certification, six (6) for Foreman Certification, three (3) for Mine Captain Certification, and one (1) each for Mining Superintendent and Mining Manager Certifications respectively.

2.3.2.4 Operators

Twenty (20) personnel were granted Operator's License

2.3.3 National Occupational Safety Association (NOSA) HSE training and baseline audit

The NOSA Integrated Five Star System; which is made up of many separate parts that equally address safety, health and environment through an integrated approach, is based on the on-going ISSMEC process which is explained below:

- I – Identify possible causes of incidents
- S – Set standards of practice and procedures
- S - Set standards of responsibility and accountability
- M – Measure performance against standards
- E – Evaluate compliance with standards
- C – Correct deficiencies and deviations

The mine has opted for the NOSA integrated five star system for the following reasons:

- i. This provides for the management of safety, health and the environment in an integrated manner, unlike the ISO 14001 and OSHAS 18001 management systems which solely focus on environment and health and safety respectively.
- ii. NOSA has a developed management system standard specifically for the mining industry. A NOSA HSE training was carried out from the 1st to the 17th of June for senior executives and supervisors. The purpose of the training was to:

- i. Educate participants on the key components of the NOSA HSE integrated management system;
- ii. Assist participants in obtaining a better primary understanding and insight into the areas of HSE related to the organisations daily operations and activities; and

- iii. Inform participants that the successful implementation and continuous improvement of the HSE system is not on the input of managers alone, but on all members of a multi-disciplinary team which includes supervisors.

The learning objectives of the training included:

- i. The common causes of incidents and the basic prevention techniques;
- ii. The main components of the system;
- iii. The relationship between the system's elements and a structured programme;
- iv. The legal requirements concerning the basic duties and responsibilities of employers and employees
- v. The importance of education and training and areas where it is needed; and
- vi. Some of the hazards and risks in the working environment and the importance of measurement and control.

After the training, a NOSA Integrated Five Star System Baseline audit; whose scope included verification of safety, health and environmental management, was conducted on the mine site from 19th to 21st June 2017. The audit followed a risk based approach thus the following aspects received particular consideration:

- i. High voltage equipment and overhead power lines;
- ii. Heavy duty mobile equipment
- iii. Lifting equipment and tackle;
- iv. Ergonomics;
- v. Working at heights;
- vi. Guarding for moving and rotating equipment;
- vii. Explosives;
- viii. Noise and dust;
- ix. Stacking and storage; and
- x. Waste management

Key findings, trends and recommendations were presented to management during the exit meeting, after which a site report; containing a detailed list of the key findings, was submitted.

2.3.4 Environmental monitoring programmes

Monitoring programmes were designed to evaluate the potential impacts of GMC's operations on the surrounding environment in order to validate the predictions made in the Environmental Impact Assessment (EIA) and the Environmental Management Plan (EMP). Critical among the monitoring programmes was the environmental quality monitoring.

2.3.5 Engagement with key stakeholders

The strategy implemented to allow for engaging with accurate, transparent and timely constructive dialogue was to schedule meetings with community leaders, traditional authorities as well as district level institutions. The essence of these meetings was to discuss issues such as

GMC planned activities, and address concerns of the community and company. Such meetings were also used to invite inputs from community leaders into GMC planned programmes.

2.3.6 Planning for Corporate Social Responsibility (CSR)

GMC's strategy with regards to CSR was to identify pertinent needs of all stakeholders; with particular emphasis on communities within the company's catchment area. The strategy was put in place to provide and commit the necessary funds and support to improve the livelihood of the people as part of its commitment to its CSR policy to provide sustainable social and economic benefits from the mining operations.

2.3.7 Follow-up monitoring and counselling under wellbeing programme

After collecting baseline data on blood pressure, blood sugar level and body mass index (BMI) of workers on site last year, the plan for this year was to conduct follow up monitoring on those workers who had any health challenges. Those workers whose conditions were getting worse were counselled on the importance of exercise, eating a balanced diet, managing stress among others. Data was also collected for newly employed workers during the year. Measures being considered to maintain the wellbeing programme include the following:

- i. Employing a fulltime wellbeing officer;
- ii. Arranging for requisite training at Goldfields Ghana Limited, Tarkwa Mine; and
- iii. Regular screening and education campaigns.

2.3.8 Quarterly HSE committee meetings

The quarterly safety committee meetings were scheduled by the HSE department for all departmental representatives, as well as from all contractors on the mine. Issues discussed related to incidents, findings of inspections and audits, HSE concerns, HSE performance among others. This was followed-up with presentations on the outcome of each meeting being disseminated to the entire workforce by way of quarterly meetings at selected venues on the mine.

2.3.9 Training on Standard Operating Procedures (SOPs)

This strategy which was adopted last year continued; where a supervisor takes personnel from his/her section or department through acceptable procedures that need to be followed to carry out tasks safely.

2.3.10 Emergency simulation drills

Simulation drills were organised in the year under review to test the skills of the emergency response team and first aiders; in the case of those scenarios that required treatment of injuries or medical conditions. The aim of such drill was to sharpen the alertness of the emergency response team and also ensure that workers have a fair understanding of the procedures outlined in the emergency response plan.

2.3.11 Training and staff development programmes

In pursuance of management's commitment to promote knowledge and enhance the skills of its workforce, the company planned and organised a variety of training programmes in the course of the year.

2.4 HSEC Targets

The following targets were set at the beginning of the year:

- Ensure that environmental incidents occurring on the mine do not exceed **short term** environmental impacts (or L2 impacts); explained in the risk matrix as any environmental impact lasting weeks with a reduced area less than a kilometre with no effect on environmentally sensitive species or habitats;
- Achieve a pass rate of 50% compliance or above, for ambient dust results submitted in the monthly environmental monitoring returns;
- To achieve a pass rate of 75% compliance or above for all other reportable environmental monitoring parameters (i.e. water quality, noise and blast);
- To undertake (a minimum of ten) projects as part of the company's CSR;
- To record a 10% reduction in community complaints lodged compared to the previous year;
- Resolve at least 75% of community complaints by the end of the year;
- Record a 10% reduction in OHS incidents occurring on the mine;
- Record no injury type above a medical treated injury (MTI);
- Avoid any HSE related fines; and
- Conduct a minimum of fifteen (15) external staff development programmes;

3. OPERATIONAL ACTIVITIES AND PRODUCTION DATA

3.1 Development of Pit C

The LOM Pit shell was extended to enable maximum extraction of the manganese ore body. The areas which fell within the pit shell needed to be developed to open up so as to achieve the aims of the extended life of the mine. The pit was re-designed as per standard bench heights and slopes to reach the ultimate Pit bottom all in the effort of becoming a model mine for Regulatory Requirements. See pictures in Plate 3.1.

Plate 3.1: Stage of Pit C development in 2017



a. Pit C development from southern view point



b. Pit C development from north eastern view

3.2 Mining Data

During the year under review, GMC's mining operations were focussed in Pit C, sections Central West North, Central-West, Central East, South West and South East. Manganese carbonate was the main ore body exploited with the budgeted stripping ratio of 13.31: 1 (tonne: tonne).

African Mining Services (AMS) and Rocksure International continued with their contracts to assist with mining activities. As at December 2017, AMS had four (4) excavators; namely EX32, EX44, EX69 and EX71, and fifteen (15) trucks on site. Three excavators were used for active production whereas the fourth one was on stand-by to replace GMC excavators on servicing. Rocksure International had one (1) excavator; i.e. EX33, and seven (7) trucks.

The figure below indicates the monthly mining data collected during the year.

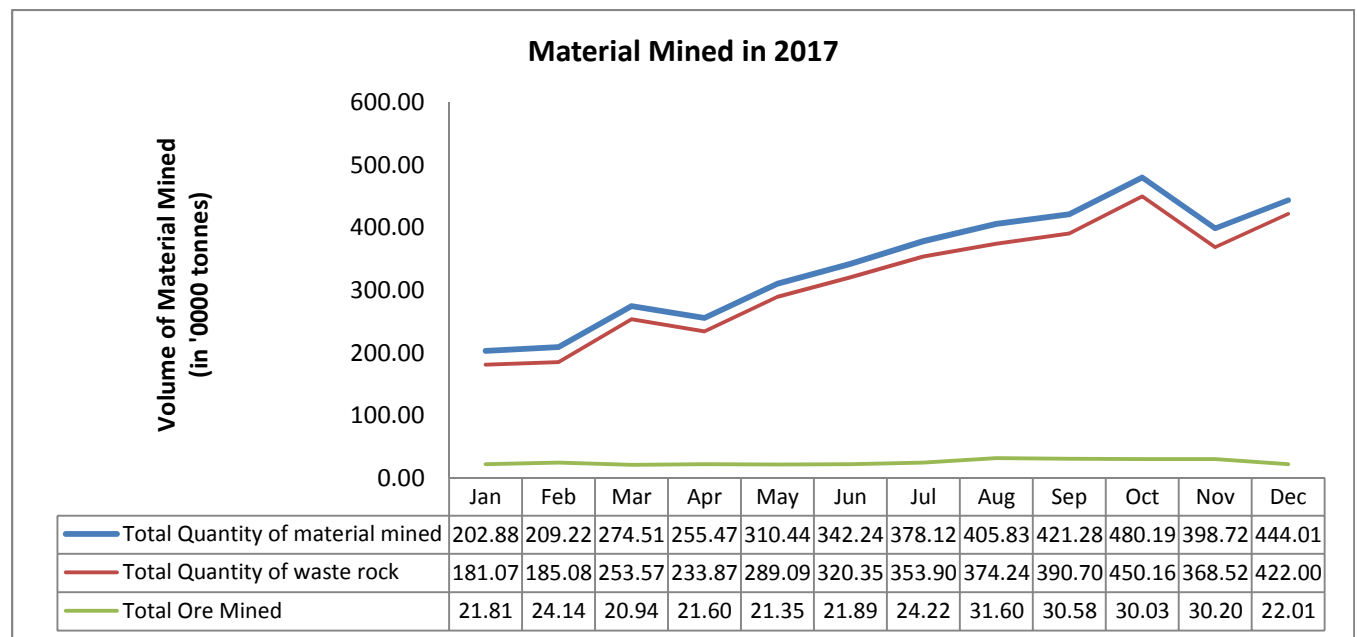


Figure 3.1: Material Mined in 2017

Specific volumes of material were mined from the following locations indicated in Table 3.1

Table 3.1: Volumes of material mined from locations within Pit C

Location	Pit C				
	Central West North	Central West	Central East	South West	South East
Total Waste Mined	3,947,533	14,039,595	17,933,572	1,953,676	351,250
Total Ore Mined	146,428	2,482,977	103,614	270,561	-
Total Material Mined	4,093,961	16,552,572	18,037,186	2,224,237	351,250

The total volume of material mined in the year was **41,229,206** tonnes. **92.71%** of which was waste rock (i.e. **38,225,626** tonnes) while the remaining **7.29%** was ore (i.e. **3,003,580** tonnes), resulting in a waste to ore stripping ratio of 12.7: 1 (tonne: tonne).

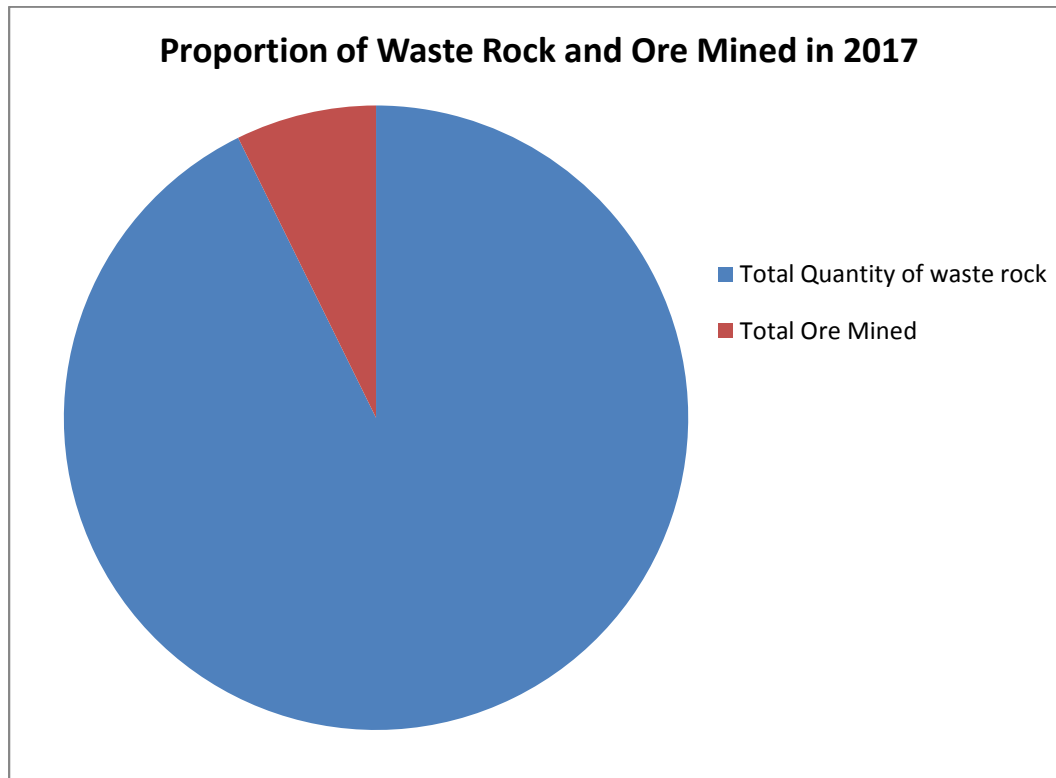


Figure 3.2: Proportion of Waste Rock and Ore Mined in 2017

No topsoil was stripped in the year under review.

A total of **439,967** tonnes of soft material was however moved to the soft waste dump in the year, of which **95.91%** was moved during Pit C Central East development (i.e. **452,967** tonnes) while the remaining **4.09%** was during a road diversion project (i.e. **18,000** tonnes).

Table 3.2 indicates the productivity of excavators on the mine site.