

# APPENDIX A

## ENVIRONMENTAL MANAGEMENT PROGRAMME

CIG/ENVSOL/21/PROJ/0037



agriculture, rural development,  
land & environmental affairs

MPUMALANGA PROVINCE  
REPUBLIC OF SOUTH AFRICA

# ENVIRONMENTAL MANAGEMENT PROGRAMME

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA) AND REGULATION 16(1) AND 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED).

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Prepared for:

**North Block Complex (Pty) Ltd**



CIG/ENVSOL/21/PROJ/0037

## QUALITY MANAGEMENT

<b>Report Title</b>	Environmental Management Programme: Proposed Realignment of the D 2809 Provincial Road.		
<b>Project Number</b>	CIG/ENVSOL/21/PROJ/0037		
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## DECLARATION OF INDEPENDENCE

Commodity Inspections Group (Pty) Ltd (CIGroup), as the Environmental Assessment Practitioner specialists, were appointed to undertake an Environmental Authorisation (EA) application and Basic Assessment Process for the Proposed Realignment of the D 2809 Gravel Provincial Road. CIGroup does not have a vested interest in the proposed activity proceedings, will not engage in and have no conflicting interest in the undertaking of the activity. CIGroup has provided all information at their disposal regarding the Scoping Report, whether such information is favourable to the Client or not.



Renee Janse van Rensburg

**Environmental Compliance and Assessment Manager**

Environmental Solutions Division

Commodity Inspections Group (Pty) Ltd

21 September 2021

Date

## CONTENTS OF AN ENVIRONMENTAL MANAGEMENT PROGRAM REPORT (APPENDIX 4 OF THE 2014 EIA REGULATIONS)

CONTENTS OF ENVIRONMENTAL MANAGEMENT PROGRAMME	SECTION OF REPORT
(1) An EMPr must comply with section 24N of the Act and include- a) details of- i. the EAP who prepared the EMPr; and ii. the expertise of that EAP to prepare and EMPr, including a curriculum vitae.	Section 2
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 3
d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- i. planning and design; ii. (pre-construction activities; iii. construction activities; iv. rehabilitation of the environment after construction and in the case of a closure activity, closure; and v. where relevant, operation activities;	Section 5 & 7
e) .....	Not applicable
f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; ii. comply with any prescribed environmental management standards or practices; and iii. comply with any applicable provisions of the Act regarding closure, in the case of a closure activity. iv. ....	Section 6
g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 8
h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 8

<b>CONTENTS OF ENVIRONMENTAL MANAGEMENT PROGRAMME</b>	<b>SECTION OF REPORT</b>
i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 8
j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 6
k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 8
l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 9
m) an environmental awareness plan describing the manner in which- <ul style="list-style-type: none"> <li>i. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</li> <li>ii. risks must be dealt with in order to avoid pollution or the degradation of the environment; and</li> </ul>	Section 10
n) specific information that may be required by the competent authority.	Section 11
(2) Where a government notice gazetted by the Minister provides for a generic EMPr, such Generic EMPr as indicated in such notice will apply.	Not applicable

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## 1 INTRODUCTION

North Block Complex (Pty) Ltd (NBC) consists of three (3) mining sections namely the Eerstelingsfontein Section, the Glisa Section, and the Paardeplaats Section. NBC are currently mining coal via opencast methods on Portion 30 of the Farm Paardeplaats 380 JT and intends to expand its opencast mining activities onto portion 13 and 29 of the Farm Paardeplaats 380 JT, which fall within the approved Mining Right (MP 30/5/1/2/2/10090 MR) area. In order to expand mining operations onto portion 13 and 29, NBC needs to permanently realign the existing D 2809 Provincial Gravel Road.

The D 2809 Provincial Gravel Road is located near eMakhazeni in the Mpumalanga Province and runs from the Siyathuthuka Road in a southerly direction until it reaches the N 4 toll road. The road is used by the general public, landowners, and workers accessing land along the road. The road falls within the approved Paardeplaats Section MR area. The responsibility for the road is currently vested with the provincial Department of Public Works, Roads and Transport (DPWRT). NBC has approached the DPWRT to undertake the realignment of the road, at their (NBCs) own cost and as approved by the DPWRT, with responsibility of the road after realignment remaining vested with the provincial DPWRT. The road is not a haul road and will not be used as a haul road. The road will remain a provincial road after realignment used the general public, landowners, and workers to access land along the road, including businesses, homesteads, and schools.

In order to undertake the realignment an Environmental Authorisation (EA) is required. The responsibility for the maintenance and management of the road lies with and will remain with the provincial DPWRT and not the mine. For this reason, as confirmed by the Department of Forestry, Fisheries and Environmental (DFFE), and application for EA is required to be submitted to the the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA).

The maps and plans of this Environmental Management Programme (EMPr) and the Basic Assessment Report (BAR) are provided in **Appendix B**.

## 2 DETAILS OF THE EAP WHO PREPARED THE REPORT

In terms of Regulation 13 of the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (GNR. 982), as amended, an independent Environmental Assessment Practitioner (EAP) must be appointed by the applicant to manage the application. Commodity Inspections Group (Pty) Ltd (CIGroup) has been appointed by NBC as the independent environmental assessors responsible for conducting the required Environmental Licensing Processes and will be responsible for Report

Development, Specialist Assessments, requisite Stakeholder Engagement Processes (SEP), and Authority and Government Department Liaison.

CIGroup’s Environmental Compliance and Assessment Manager, Renee Janse van Rensburg, will be the project EAP are her contact details are provided in **Table 2.1**.

**Table 2.1: Contact Details of the EAP.**

<b>NAME OF COMPANY</b>	Commodity Inspections Group (Pty) Ltd
<b>CONTACT PERSON</b>	Renee Janse van Rensburg
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<b>EMAIL ADDRESS</b>	<a href="mailto:reneejvr@cigroup.za.com">reneejvr@cigroup.za.com</a>

## 2.1 Expertise Of The EAP

The project EAP is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, 2014, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that the EAP is:

- Objective and independent;
- Has expertise in conducting EIAs;
- Complies with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

### 2.1.1 EAP Qualifications

The qualifications of the project EAP are presented in **Table 2.2** whilst proof of the qualifications is provided in **Appendix D**. The project EAP is responsible to ensure that Continued Professional Development (CPD) is prioritised. A summary of the project EAPs CPD the last five (5) years is provided in **Table 2.3**.

**Table 2.2: Qualifications of the EAP.**

<b>YEAR OBTAINED</b>	<b>QUALIFICATION</b>	<b>TERTIARY INSTITUTION</b>
2003	MSc (Environmental Management)	Rand Afrikaans University, now the University of Johannesburg
2001	BSc Honours (Geography & Environmental Management)	
2000	BSc (Earth Sciences)	

**Table 2.3: CPD of the EAP.**

<b>YEAR COMPLETED</b>	<b>COURSE/PROGRAMME DETAILS</b>
In Progress	Carbon Footprint Analyst
2020	Environmental Law Event
2020	Renewable Energy Workshop
2019	Environmental Law Update
2019	Transforming Our World: Achieving the Sustainable Development Goals
2019	The Business of Mining
2019	Mine Closure and Recent Case Law
2018	Environmental Law Event
2018	Environmental Law Update
2018	International Climate Change Law & Policy
2018	Understanding NEM:WA
2017	National Adaptation Plans
2017	Environmental Law Update

### **2.1.2 Summary Of The EAPs Past Experience**

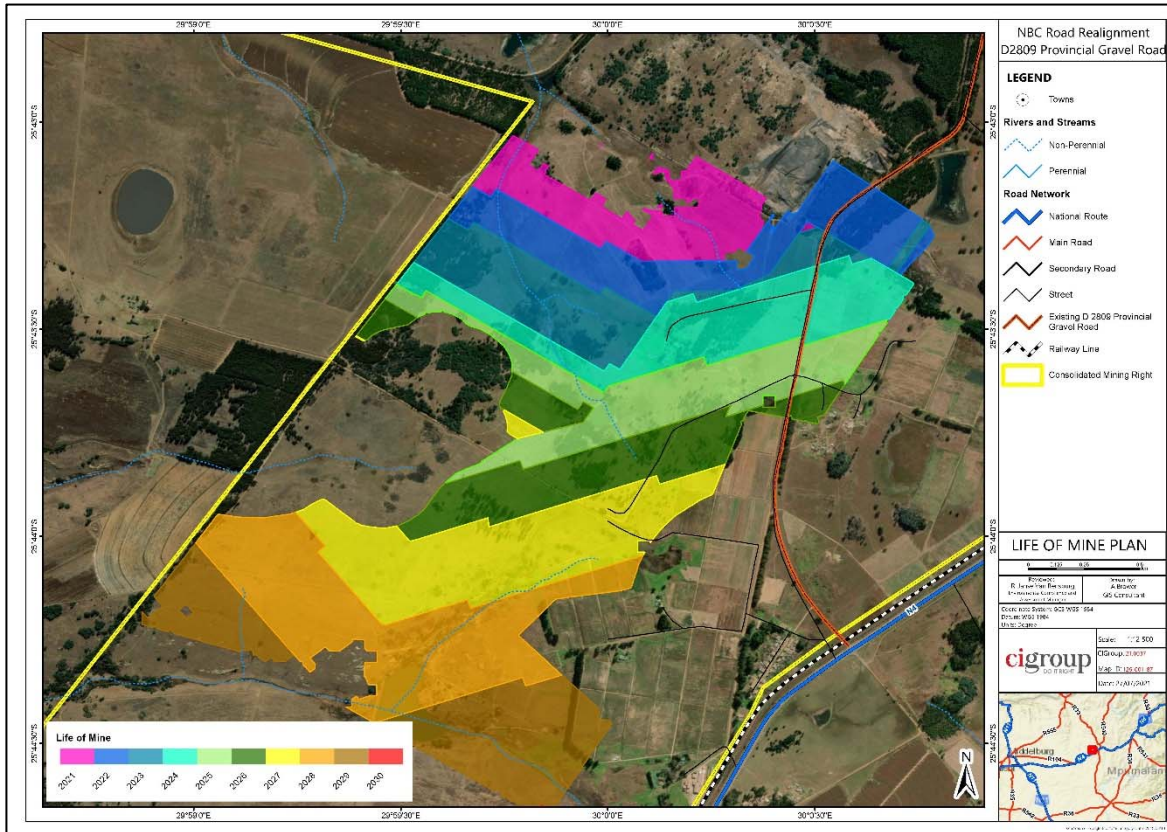
The project EAP has over 19 years’ experience in mining projects, integrated environmental, water and waste authorisation processes, environmental and water auditing and performance assessments, and the management of large inter-disciplinary specialist teams. She has the ability to develop and maintain relationships with authorities and significant experience in stakeholder engagement processes including consultation with responsive or hostile Interested and Affected Parties (I&APs), Non-governmental Organisations (NGOs), and the general public. She has a proven track-record in obtaining positive environmental, water and waste authorisations. She is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) and is a registered Professional Natural Scientist (Pr.Sci.Nat) with the South African Council for Natural Scientific Professions (SACNASP).

The project EAPs Curriculum Vitae detailing her expertise in EA processes is presented in **Appendix D** together with her professional registrations.

## **3 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY**

The D 2809 Provincial Gravel Road is located near eMakhazeni in the Mpumalanga Province and runs from the Siyathuthuka Road in a southerly direction until it reaches the N 4 toll road. The project falls within the eMakhazeni Local Municipality (LM) which falls under the Nkangala District Municipality (DM). The existing road is east of the current NBC opencast mining operations and

traverses' portion 13, 29 and 30 of the Farm Paardeplaats 380 JT. The most recent (2021) Life of Mine (LoM) plan from NBC extends beyond the existing road (**Figure 3.1**), necessitating the permanent realignment of the road.



**Figure 3.1: 2021 LoM Plan.**

The proposed realigned D 2809 road will traverse only 2 farm portions, namely portion 13 and 29 of the Farm Paardeplaats 380 JT. The location description for the proposed realigned D 2809 road is provided in **Table 3.1**. The co-ordinates of the proposed permanent realignment of the D 2809 Provincial Gravel Road are presented in **Table 3.2**, whilst the location of the proposed road is presented in **Figure 3.2**.

**Table 3.1: Property Details for the Proposed Realigned D 2809 Provincial Gravel Road.**

<b>FARM NAME</b>	Paardeplaats 380 JT
<b>APPLICATION AREA</b>	±20,800 – 24,000 m <sup>2</sup> <i>*dependent on final design</i>
<b>MAGISTERIAL DISTRICT</b>	Nkangala District Municipality and the Emakhazeni Local Municipality



<b>DISTANCE AND DIRECTION FROM NEAREST TOWN</b>	±3.5 kilometres (km) south-south-west of the town of eMakhazeni (Belfast) and approximately 3.8 km south-south-east of the closest formal settlement, Siyathuthuka Township		
<b>21 SURVEYOR GENERAL CODE FOR EACH FARM PORTION</b>	Paardeplaats 380 JT	Portion 13	TOJT0000000038000013
	Paardeplaats 380 JT	Portion 29	TOJT0000000038000029

**Table 3.2: Starting, Middle and End Point of Activity.**

ACTIVITY	LATITUDE (S)			LONGITUDE (E)		
	°	'	"	°	'	"
Starting Point of Activity	25°	42'	51.90"	30°	00'	53.41"
Middle Point of Activity	25°	43'	43.62"	30°	00'	52.99"
End Point of Activity	25°	44'	11.67"	30°	00'	31.02"



**Figure 3.2: Location of the Proposed Realigned D 2809 Provincial Gravel Road.**

**Table 3.3** details the farm portions on which the D 2800 road will be realigned (Windeed, 2021).

**Table 3.3: Land Ownership for the Proposed D 2809 Provincial Gravel Road Realignment.**

LANDOWNER	PORTION NUMBER	FARM NUMBER	REGISTRATION DIVISION	SG CODE
North Block Complex (Pty) Ltd	13	380	JT	TOJT0000000038000013
North Block Complex (Pty) Ltd	29	380	JT	TOJT0000000038000029

### 3.1 Detailed Project Description

The information in this Section was extracted from the Detailed Road Design report (Strydom & Malan, 2020), which is provided in **Appendix E**. It must be noted that this report is currently being updated based on adjustments to the proposed road realignment route to accommodate environmental concerns. The updated report will be provided with the Final BAR.

#### 3.1.1 Road Design Standards

The proposed road has been designed in accordance with TRH17 and TRH20 specifications and the guidelines proposed by the South African National Road Agency Limited (SANRAL) and the Council for Scientific and Industrial Research (CSIR). The standards used are summarised in **Table 3.4**.

**Table 3.4: Road Design Standards Utilised.**

ASPECT	STANDARDS
Design Speed	80 km/h except for the take-off bends which are 60 km/h
Minimum K-values for the vertical curves	33 for crest curves 25 for sag curves
Minimum length for vertical curves	140 m
Minimum longitudinal slope of road	0.5% (1:200)
Maximum longitudinal slope of road	7% (1:14.29)
Minimum radius of horizontal curvature for 80 km/h	210 m (actual minimum used: 250 m)
Minimum radius of horizontal curvature for 60 km/h	110 m (actual minimum used: 110 m)
Road width of gravel road	8 m
Cross fall of road	3% (1:33.33)
Proposed road reserve	25 m
Gravel wearing coarse	2 175 mm = 350 mm

#### 3.1.2 Structural Design of the Unpaved Gravel Road

The structural design of the unpaved gravel road was done in accordance the TRH20 specifications. The maximum number of Average Daily Traffic (ADT) or vehicles was taken as 200 (with 60 heavy

vehicles, 80 kN axles) per day. The road will consist out of two 175 mm thick gravel layers apart from the fill required to form the vertical alignment. This would give a road design life or re-graveling frequency of 10.67 years with regular grader and roller maintenance.

The option of less traffic, namely ADT = 150 (45 heavy vehicles) was also calculated for the two 175 mm thick gravel layers and it would give a road design life or re-graveling frequency of 12.71 years with regular grader and roller maintenance.

The road design life or re-graveling frequency with regular grader and roller maintenance can only be confirmed once the actual characteristics of the borrow materials for the layer works are known.

### **3.1.3 Hydrology and Stormwater Management**

Stormwater management is a critical component in gravel road design to ensure a good level of service and user safety. The stormwater management system was designed for a 1 in 20 year storm occurrence.

#### **3.1.3.1 Catchment Areas and Flood Calculations**

Ten (10) different catchment areas affecting the new road were identified.

The Rational Method was used to determine the stormwater peak floods. A mean annual rainfall of 732.5 mm was used with the mean 24 hour maximum as 60.5 mm and the mean thunder days per annum as 69. A runoff factor of 0.33 was used for the predominantly flat (hydrological classification) area. The surface runoff for each catchment area was evaluated as percentages between a defined water course and overland flow. The time of concentration was thus calculated with the percentage's for each type of flow. The runoff will predominantly consist of overland flow.

The data and peak flows for the individual catchment areas are summarised in **Table 3.5**.

**Table 3.5: Data and Peak Flows per Catchment.**

CATCHMENT AREA	AREA (m <sup>2</sup> )	PEAK FLOW (l/s) 1:20 YEAR RETURN	PEAK FLOW (l/s) 1:50 YEAR RETURN
1	46,039	486	682
2	57,716	528	741
3	348,107	2,452	3,443
4	18,311	233	327
5	18,735	212	297



CATCHMENT AREA	AREA (m <sup>2</sup> )	PEAK FLOW (l/s) 1:20 YEAR RETURN	PEAK FLOW (l/s) 1:50 YEAR RETURN
6	32,912	330	464
7	146,969	1,197	1,681
8	215,900	1,767	2,481
9	177,215	1,478	2,076
10	236,722	1,724	2,422

### 3.1.3.2 Stormwater Berms

Stormwater berms will be constructed from the clayey cut to spoil material from the road cross section to prevent the flooding of the new road. These berms will direct the stormwater runoff to existing stream channels and dams. At critical positions, the stormwater will be directed underneath the road through pipe culverts. The flow capacities of the berms were calculated as open channel flow with the Manning theory.

### 3.1.3.3 Stormwater Culverts/Pipes

Where water velocities are high and the direction of flow changes rapidly, erosion will occur. All the culverts envisaged have conventional inlets with wing-walls. Stone pitching will be provided over a distance of twice the vertical dimension upstream of the culvert inlet, including the concrete slab between the wing-walls.

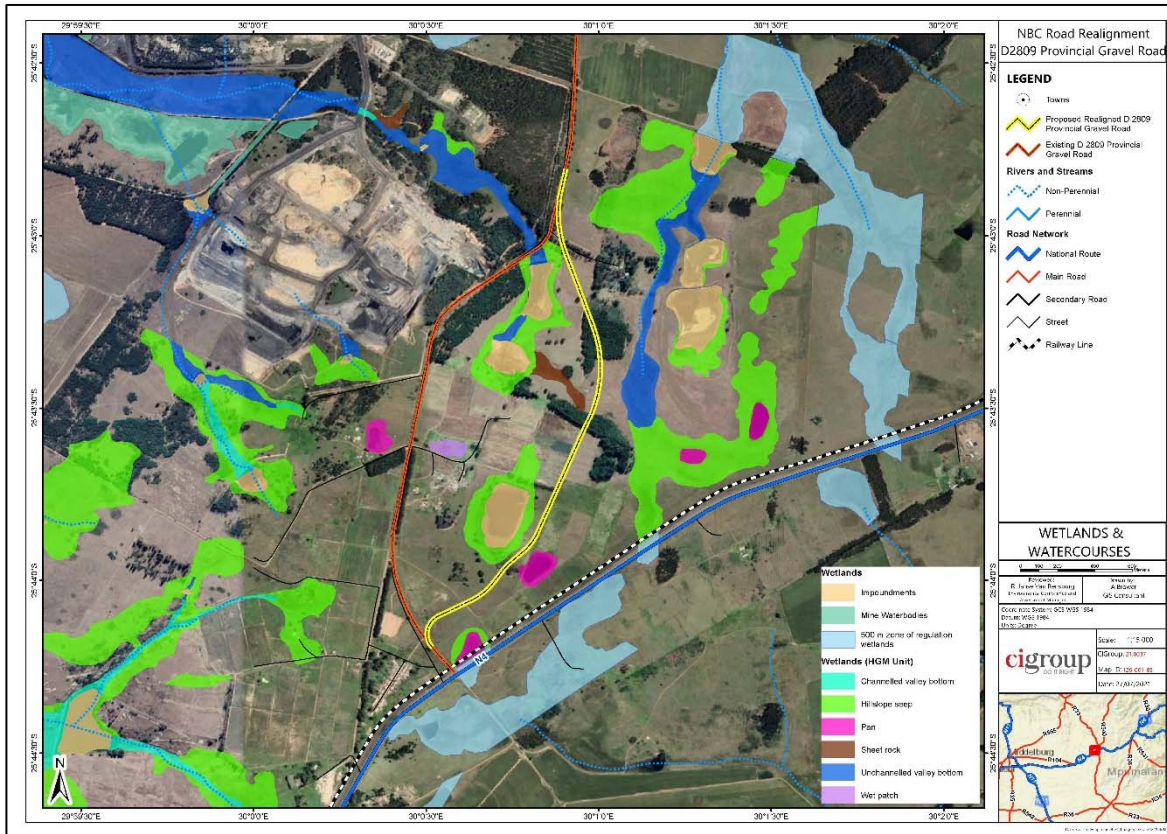
Provision will be made for energy dissipation and erosion protection downstream of the culvert, with stone pitching over a distance of twice the vertical dimension downstream of the culvert outlet, including the concrete slab between the wing-walls.

The slope (gradient) of the culverts cannot be at the same level for the inlet and outlet of the culvert as the slowing of the flow will cause sand and silt sedimentation and reduction in the culvert flow capacity. Water velocities will be altered as little as possible, and a minimum flow velocity of 0.7 m/s will be ensured to prevent sedimentation.

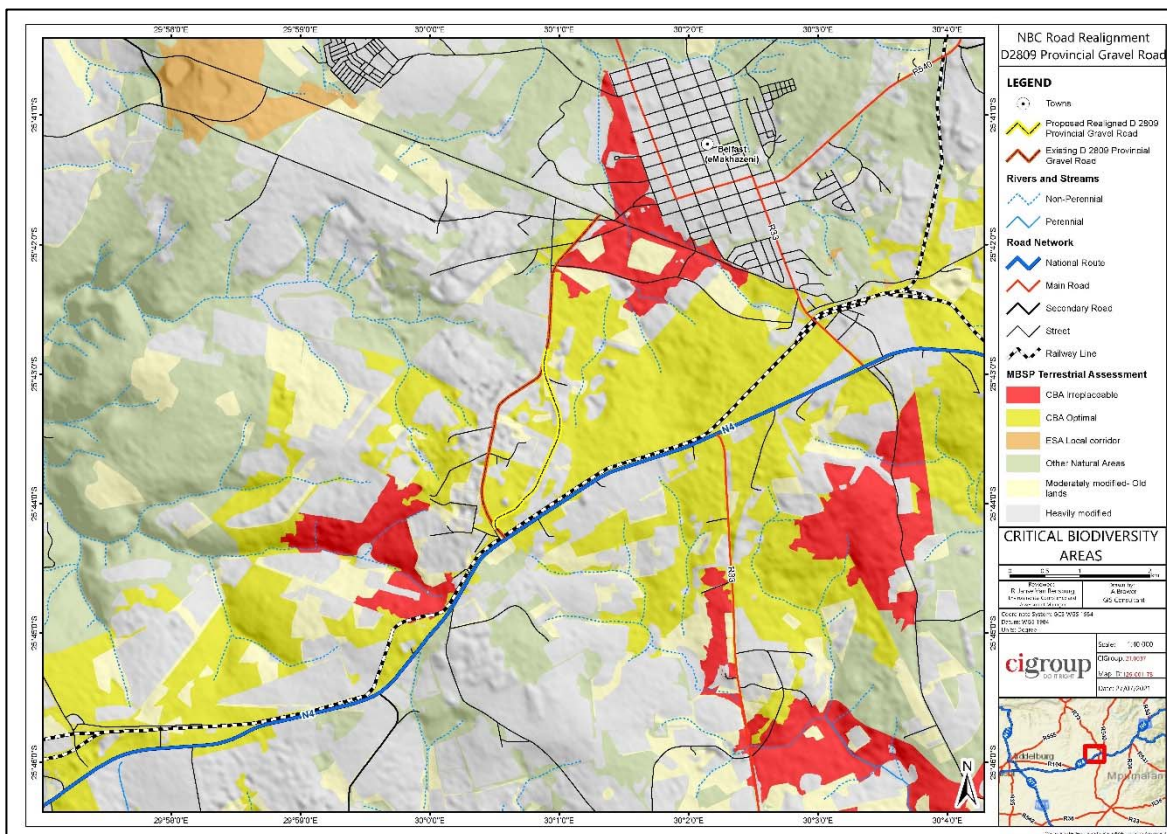
The flow capacities of the pipe culverts were calculated with the Manning theory.

## 3.2 Sensitive Areas

**Figure 3.3 – Figure 3.6** present the sensitive areas as identified during the specialist assessments.



**Figure 3.3: Wetlands Associated with the Proposed Road Realignment.**



**Figure 3.4: Critical Biodiversity Areas Associated with the Proposed Road Realignment.**





**Figure 3.5: Heritage Sites Associated with the Proposed Road Realignment.**



**Figure 3.6: Floral SCC Associated with the Proposed Road Realignment.**

## 4 Purpose OF THE EMPR

NBC is applying for the Environmental Authorisation (EA) for the road realignment to be able to mine the Paardeplaats Section as per the LoM plan (**Figure 3.1**). During construction NBC will be responsible for implementing the EMPr, however upon completion of construction the responsibility for the road will revert to Mpumalanga Department of Public Works, Roads and Transport (DPWRT).

The purpose of the EMPr for the proposed realignment of the D 2809 Provincial Gravel Road is as follows:

- To describe how potential negative environmental impacts will be managed through appropriate mitigation measures;
- To describe actions that could be taken to rehabilitate the affected areas especially during the construction phase;
- To prescribe monitoring actions that will ensure that the environmental management programme is adhered to; and
- To describe how potential positive environmental impacts will be maximised.

During an environmental evaluation and assessment process, various impacts were identified, and mitigation measures developed for these impacts. These mitigation measures have been organised and co-ordinated into the EMPr, which will guide the construction and maintenance of the road realignment. The EMPr will remain in force for the whole duration of the project and will be subject to various audits. The EMPr is a living document which may be subject to necessary updates in the interest of best practices.

### 4.1 General Objectives of the EMPr

Through the development of this EMPr, NBC wants to achieve the following objectives:

- Identify all possible impacts that may arise from the development;
- Have detailed mitigating measures in place that the contractors and sub-contractors have to adhere to in order to avoid or minimise identified impacts;
- Define corrective measures that need to be implemented should non-conformances occur;
- Propose measures to eliminate possible negative long term impacts that may result from the construction phase;
- Propose the best practice rehabilitation measures;
- Ensure the health and safety of all relevant role players; and
- Ensure the successful handover of the EMPr to the responsible party during operation.

The overall objective of the EMPr is to reduce or mitigate negative environmental consequences resulting from the construction and operational process and to limit negative impacts as far as possible. The EMPr also aims to enhance positive impacts. The environmental objectives of the EMPr are to ensure that all necessary steps will be taken to ensure the following with regard to identified impacts:

- That appropriate pollution control and other environmental protection measures are taken by the applicant, in accordance with all applicable laws and regulations;
- That the applicant will not degrade the degree of environmental impact beyond existing environmental conditions; and
- That, socio-economic and bio-physical conditions will be addressed in order to ensure that minimal negative impacts are caused by the realignment of the roads.

The EMP applies to each aspect identified during the construction and operational phases. The onus for the implementation of the EMP lies with NBC for the construction phase, and with the Mpumalanga DPWRT. NBC shall ensure that all environmental legal requirements and specific EMP requirements are disclosed to all employees and contractors through induction or environmental awareness campaigns. It is imperative that all employees and contractors are aware of the environmental obligations NBC have in order to promote environmentally conscious behaviour at the mine.

NBC must identify training needs for employees and contractors to ensure that all personnel whose work may have an impact on the receiving environment receive appropriate training. The Environmental Awareness Plan included herewith describes the training available and the manner in which environmental training needs are identified and continually reassessed.

## **4.2 Approval and Implementation of the EMPr**

The Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) must approve the EMPr before it can be used as a legal binding document. The EMPr must ensure that the conditions of the EA are implemented and adhered to. Copies of the approved EMPr must be made available to the following persons at all times:

- The applicant;
- The Mpumalanga DPWRT; and
- The workers on site who participate in the construction of the proposed construction and operation of the proposed roads.

The EMPr must be explained to the applicant, the construction manager, DPWRT, contractors and all workers who will participate in the construction process. It remains the responsibility of the



applicant and owner to ensure that regular internal audits are performed before, during and after construction and during the operation to ensure that the enhancement and mitigation measures are implemented.

### **4.3 Roles and Responsibilities**

In order to ensure the success of the EMPr, it is important to assign definite roles and responsibilities. Compulsory adherence is to be made to the EMPr. The obligations of the EMPr create a legally binding document in terms of environmental legislation and civil law. It is important that contractors and sub-contractors ensure that all relevant aspects of the EMPr are communicated to all of their employees. It is the duty of the contractors, sub-contractors and their employees to fulfil the project objectives with specific reference to the prevention and mitigation of impacts caused by the construction and related activities. It is the responsibility of the MDARDLEA to ensure that the development takes place according to the relevant legislation.

#### **4.3.1 Government Departments**

As the responsibility for the protection of our natural heritage lies with the government departments, they have the power to conduct site inspections to ensure that the development complies with all legislation, regulations and standards. They may enforce penalties where non-compliance occurs.

Furthermore, as the D 2809 is a provincial road, the Mpumalanga DPWRT will be the responsible department and owner of the completed realigned road. Thus maintenance responsibilities will not lie with NBC after construction and will become the responsibility of the said department.

#### **4.3.2 Project/Site Manager**

The Project/Site Manager will oversee all of the construction activities. He/she will be responsible for the activities on site and see to the implementation of the EMPr. He/she will establish a communication network between the different companies conducting the work. All incidents and reports will be made to the Project/Site Manager. Ultimate responsibility in terms of compliance to the EMPr lies with the Project/Site Manager.

#### **4.3.3 Contracting Engineer**

The ultimate on-site responsibility for environmental matters lies with the main Contracting Engineer. They will be responsible for day to day direction and management on the site throughout the construction phase of the project.

#### **4.3.4 Environmental Officer or Safety, Health and Environmental Quality Office**

An Environmental Officer (EO) or Safety, Health and Environmental Quality (SHEQ) Officer must be appointed by the Contracting Engineer. It will be the responsibility of the EO/SHEQ Officer to:

- Oversee that the day to day activities that will take place on site comply with the EMPr and the relevant legislation;
- To prepare a detailed communication strategy for liaison with I&APs, stakeholders and contractors;
- Manage and document forward and backward information flows between the Contracting Engineer, I&APs and NBC. This includes information pertaining to monitoring and evaluation;
- Assist NBC, upon request, with daily project communication with I&APs;
- Ensure meaningful participation with the I&APs, including capacity building exercises where the need is identified;
- Give induction and environmental awareness training;
- Ensure that a record keeping system is maintained; and
- Promote co-regulation, shared responsibility and a sense of ownership amongst all parties involved.

#### **4.3.5 Environmental Control Officer**

In order to ensure full compliance to the EMPr and in effect the legislation, NBC must appoint an independent Environmental Control Officer (ECO) external to NBC and the Contracting Engineer.

The responsibilities of the ECO will be:

- To monitor the construction activities through regular site inspections to ensure compliance to the EMPr;
- To assess the EMPr as to its effectiveness in mitigating and preventing impacts;
- To assess compliance to the EA;
- To advise the Project Manager, Contracting Engineer and EO/SHEQ Office in respect of the activities and its impact on the environment;
- To identify any non-compliances and to advise to the immediate action and remediation;
- To compile reports every two weeks during construction and communicate the findings to the Project Manager and contractors;
- To write a monthly compliance report and submit it to the regulatory authority, in this case the MDARDLEA;
- To ensure monthly project meetings are undertaken with the contractors and the Project Manager to discuss the findings made during the site visits;
- To ensure that the best environmental options are followed throughout;

- To ensure that a proper training, awareness and competence training programme is implemented; and
- To, where necessary, update the EMPr as new issues may arise.

## 5 IMPACT MANAGEMENT OBJECTIVES

The impact management objectives are presented in **Table 5.1**.

**Table 5.1: Impact Management Objectives.**

GENERAL ASPECT	OBJECTIVE
Air Quality	To manage the project in such a way as to ensure that the impact on the air quality is prevented and reduced. To ensure that the dust impacts from the construction and operational activities do not exceed guideline levels at key receptor sites in the vicinity of the road.
Soil, Land Use and Land Capability	To ensure that soil impacts are minimised during the construction and operational phases. To ensure that soils are no longer disturbed after the construction phase. To prevent soil erosion.
Heritage	To prevent any disturbance or destruction to heritage sites situated in close proximity to the road.
Traffic	To ensure that road users adhere to traffic and road rules.
Noise	To ensure that measures are implemented to reduce the disturbing noise to nearby sensitive receptors.
Visual	To minimise the visual impacts associated with the construction of the road.
Social	To enhance the positive impacts and to reduce the negative impacts that road construction will have on the environment.
Surface Water	To ensure that surface water resources are prioritised, and pollution or degradation thereof is minimised.
Groundwater	To prevent and minimise the impact of the operations on the surrounding groundwater quality.
Freshwater Ecosystems	To ensure that wetlands and freshwater ecosystems are conserved, pollution or degradation thereof is minimised.
Terrestrial Biodiversity	To maintain the status quo after construction is completed and to conserve and protect the structure of the vegetation community and prevent further loss of species diversity. To prevent pollution resulting in extensive impacts on herpetofauna, mammals and avifauna, and habitat destruction.
Palaeontology	To prevent any disturbance or destruction to palaeontological (fossiliferous) finds during construction of the road.



## **6 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES**

The impacts that are to be mitigated in their respective phases is presented in **Table 6.1**.

**Table 6.1: Impacts to be Mitigated.**

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
<b>Air Quality</b>					
Construction	Removal of topsoil	Dust-fall rates exceeding the residential guideline of 600 mg/m <sup>2</sup> /day.	Dust suppression on all gravel roads through the use of water sprayers or chemical stabilisers. Establish wind breaks where possible.	NEM: AQA GNR 827 SANS 1929: 2011	Immediately. Maintained throughout construction.
Construction	Heavy machinery and vehicle movement	Dust liberation as a result of vehicular and machinery use and movement.	Dust suppression on all gravel roads through the use of water sprayers or chemical stabilisers. Exhaust pipes of vehicles should be directed so that they do not raise dust.	Air Quality Management Plan	
Construction	Road construction	Dust liberation as a result of construction activities.	Dust suppression on all gravel roads through the use of water sprayers or chemical stabilisers. Exhaust pipes of vehicles should be directed so that they do not raise dust.		
Construction	Removal of vegetation	Dust liberation as a result of wind.	Revegetation of exposed areas with indigenous vegetation as an erosion control option. Keep denuded areas moist or vegetated to lessen dust liberation.		
Construction	Removal of topsoil	Dust liberation as a result of soil handling.	Handling of soil should be undertaken on less windy days.		
<b>Soil, Land Use and Land Capability</b>					
Construction	Removal of vegetation	Loss of fertile topsoil due to vegetation clearance. Increased susceptibility to erosion due to removal of vegetation cover. Increased soil erosion due to vegetation clearance.	Retain maximum surface vegetation cover. Restrict vegetation clearance as far as possible. Restrict vegetation clearance to a minimum footprint area. Undertake vegetation clearance in as short a duration as possible.	NEM: WA Soil Utilisation and Management Plan	Immediately. Maintained throughout construction.
Construction	Road construction	Loss or reduction in soil fertility due to activities connected to road construction.	Retain maximum surface vegetation cover. Restrict vegetation clearance to a minimum footprint area.		
Construction	Heavy machinery and vehicle movement	Compaction of soil surface due to various activities and vehicular and machinery use and movement.	Restrict vehicular and machinery use and movement as far as possible.		
Construction	Hydrocarbon, fuel or chemical handling and spillage	Contamination of soil due to chemical or affected water spillages.	Implement correct procedures for chemical handling and storage to minimise spillages. Address chemical and water spillages promptly through accepted corrective actions.		
Construction	Road construction	Alteration in prevailing terrain due to construction activities.	Keep excavation to minimum and avoid, where possible, wetlands and depression areas.		
Construction	Removal of topsoil	Loss of soil with an arable agricultural potential due to the removal of soils.	Ensure that soil is correctly removed and retain topsoil.		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
Construction	Removal of topsoil	Change in natural landscape due to soil removal.	Minimise changes to natural landscape as far as practically implementable.		
Operation	Hydrocarbon spillages	Pollution of gravel road through spillages	Implement pollution control measures	Maintenance Plan	After construction. Maintained throughout operation.
Operation	Heavy machinery and vehicle movement	Compaction of soil due to road use	Routine road maintenance to be undertaken		
Operation	Maintenance	Soil erosion due to increase in denuded areas	Revegetate denuded areas		
<b>Heritage</b>					
Construction	Road construction	No impact is expected on low significant sites (PP 38, PP 39 & PP 41).	No mitigation required.	NHRA Palaeontological and Heritage Management Plan	Immediately. Maintained throughout construction.
Construction	Road construction	Impact on Graves and Burial Grounds (PP 5 & PP 31)	Ensure in situ preservation of these sites by establishing a 20 m buffer zone around such sites. Should in situ preservation not be possible then the following mitigation measures will apply: A grave relocation process must be undertaken. A detailed social consultation process, at least 60 days in length, consisting of the attempted identification of the next-of-kin in order to obtain their consent for the relocation. Bilingual site and newspaper notices indicating the intent of the relocation. Permits from all the relevant and legally required authorities. An exhumation process that keeps the dignity of the remains and family intact. An exhumation process that safeguards the legal rights of the families as well as that of the applicant. The exhumation process must be done by a reputable company well versed in the mitigation of graves.		
Construction	Road construction	Impact on historic homesteads and structures with the possible risk for unmarked graves (PP 6 & PP 32).	Ensure in situ preservation of these sites by establishing a 20 m buffer zone around such sites. Should in situ preservation not be possible then the following mitigation measures will apply: A social consultation process to assess whether any local residents or the wider public is aware of the presence of graves at sites PP 6 & PP 32. Depending on the outcome of the social consultation process, three different outcomes would be the result, namely: Outcome 1: The social consultation absolutely confirms that no graves are located here.		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
			Outcome 2: The social consultation absolutely confirms that graves are located here. Outcome 3: The social consultation does not yield any confident results.		
Construction	Road construction	Impact on historic farmsteads and historical structures (PP 30).	Ensure in situ preservation of these sites by establishing a 20 m buffer zone around such sites. Should in situ preservation not be possible then the following mitigation measures will apply: An architectural historical specialist must be appointed to undertake a specialist assessment of these sites. The recommendations made by the specialist must be implemented.		
Construction	Road construction	Chance finds of a potential grave during construction.	All activities must be halted in the area of the discovery and a qualified archaeologist contacted. The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures. If mitigation is necessary, an application for a rescue permit must be lodged with SAHRA. After mitigation, an application must be lodged with SAHRA for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.		
Construction	Road construction	Accidental discovery of graves during construction.	Upon the accidental discovery of graves, a buffer of at least 20 m should be implemented. All activities must cease in the area and a qualified archaeologist be contacted to evaluate the find. To remove the remains, a permit must be applied for from SAHRA and other relevant authorities. The local South African Police Services must immediately be notified of the find. Where it is recommended that the graves be relocated, a full grave relocation process that includes a comprehensive social consultation must be followed.		
Construction	Road construction	Impact on paleontological (fossil) finds.	If fossiliferous material is found an appropriate palaeontological expert must be appointed so that the material can be thoroughly assessed, recorded and professionally excavated or sampled.		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
Operation	Maintenance	Encroachment on heritage sites due to maintenance activities	Maintain buffer zones around identified heritage sites.	Maintenance Plan	After construction. Maintained throughout operation.
<b>Traffic</b>					
Construction	Road construction	An increase in traffic on the adjacent road network.	All lanes must have minimum width of 4 m on approach to any intersection. Ensure that all roads are clearly marked and sign-posted with warning signs and speed limit signs as required.	Traffic Management Plan	Immediately. Maintained throughout construction.
Construction	Road construction	Changes in travel time.	Establish alternative routes for travel until construction is completed.		
Construction	Road construction	Additional heavy vehicles on gravel roads.	Enforce a speed limit to minimise vehicle entrained dust liberation. Dust suppression on all gravel roads through the use of water sprayers or chemical stabilisers.		
Construction	Road construction	Impact on road safety.	Provide road safety features, such as speed bumps, where practically implementable.		
Operation	Road operation	Increase in traffic volumes and road safety infringements	Ensure road signage and speed limits are enforced		
<b>Noise</b>					
Construction	Road construction	Noise disturbance and noise nuisance at rural noise sensitive receptors	Construction site yards should be located well away from noise sensitive areas adjacent to the development sites. All vehicles and equipment are to be kept in good repair. Activities, and particularly the noisy ones, are to be confined to reasonable hours during the day and early evening. Where possible, very noisy activities should not take place at night (between the hours of 20h00 - 06h00). Construction should be restricted to the period between 08h00 - 16h00. Particularly noisy equipment must be insulated. With regard to unavoidable noisy activities in the vicinity of noise sensitive areas, the contracting engineer should liaise with local residents on how best to minimise the impact.	SANS 10328: 2008 SANS 10103: 2008 SANS 10210: 2004 Noise Management Plan	Immediately. Maintained throughout construction.

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
			Machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum. Staff working in areas where the 8-hour ambient noise levels exceed 75 dBA should wear ear protection equipment.		
Operation	Road operation	Increase in noise nuisance	Comply with the road safety aspects of the road and keep safe distance from other vehicles. Keep within the road speed. Road to be maintained in a good order at all times.	Maintenance Plan	After construction. Maintained throughout operation.
<b>Visual</b>					
Construction	...	Day and night-time visual impact on the surrounding sensitive receptors	Revegetate exposed areas as soon as possible after construction activities are complete.	Visual Impact Management Plan	Immediately. Maintained throughout construction.
Construction	Road construction	The visual impact of dust on the surrounding sensitive receptors	Dust suppression techniques should be in place at all times during all phases. Limit site clearance to the smallest footprint area possible. As much vegetation as possible should be kept during site clearance. Revegetate exposed areas as soon as possible after construction activities are complete.		
<b>Social</b>					
Construction	Road construction	Change in social dynamic of resident communities	Employ local or existing labour as far as possible (within a 20 km radius). Avoid the establishment of camps or temporary accommodation for workers.	Procurement Policy Communication Strategy Traffic Management Plan NEM: AQA. GNR 827. SANS 1929: 2011. Air Quality Management Plan. Health and Safety Plan Traffic Management Plan	Immediately. Maintained throughout construction.
Construction	Road construction	Change in land use	Educate landowners in terms of their rights and responsibilities prior to the project going ahead. Develop clear communication lines when consulting with affected landowners and their employees.		
Construction	Road construction	Increase in traffic and heavy machinery or vehicles on roads	Speed limits on the local roads surrounding the construction site should be enforced. Appropriate traffic management measures should be planned for and implemented, where practically possible.		
Construction	Road construction	Increase in crime	Safety and security measures must be implemented to avoid any increase in criminal activities within the area.		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
Construction	Road construction	Impact of dust fallout on the livelihoods of the agricultural community. Health impacts such as asthma, sinusitis, allergies and other respiratory diseases attributed to dust generation.	Undertake dust suppression on all gravel roads through the use of water sprayers or chemical stabilisers. Effective monitoring of ambient air quality should be implemented.		
Construction	Road construction	Overall health and safety risk of workers	The necessary safety precautions should be taken, and first aid supplies should be made available on site.		
Construction	Road construction	Change in sense of place	Existing community forums must serve as liaison between the affected stakeholders and the applicant and should focus on traffic, dust, noise and construction related concerns. Prevent dust liberation through the use of water sprayers or chemical stabilisers. Traffic calming measures should be put in place to minimise traffic noise.		
Construction	Road construction	Gender division of labour	Women must have equal employment opportunities. Salaries of women should be equal to that of men when undertaking the same job.		
<b>Surface Water</b>					
Construction	Removal of topsoil	Siltation of wetlands and water resources	Stabilise impacted soils and keep vehicle movement to designated access roads.	Surface Water Management Plan Hydrocarbon Handling Procedure	Immediately. Maintained throughout construction.
Construction	Heavy machinery and vehicle movement	Pollution of surface water due to spillages, seepages or leaks and improper waste handling, storage and disposal.	All hazardous substances must be stored and handled on impervious substrates and bunded areas that are able to contain potential spillage. Waste handling and storage facilities must be located away from surface water resources and drainage lines. All vehicles and equipment must be kept in good working order and regularly serviced. Should a spill occur then the incident management procedure of the contracting engineer should be followed.		
Construction	Road construction	The construction of the road and stormwater management infrastructure have the potential to alter the sites natural, pre-existing surface water drainage patterns influencing the volume of water that enters the receiving environment.	Areas should be sloped to allow for free runoff toward the receiving environment. Restrict the use of surface water.		
Construction	Road construction	Alteration of the natural pre-existing surface water drainage patterns and slopes of the area may result in increased erosion and sedimentation which may enter receiving surface water bodies.	No development should occur within the 1:100 year flood line of any drainage line, unless authorised.		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
			Vegetation clearance and soil disturbances should be limited to the smallest footprint area possible and erosion control measures implemented. Movement of machinery and vehicles must be limited to identified roads and must avoid sensitive areas. Areas should be sloped to allow for free runoff toward the receiving environment.		
Construction	Road construction	Due to the close proximity to wetlands and drainage lines the risk of flooding exists.	Monitor national and regional flood warning updates.		
Operation	Road operation	Sedimentation of surface water resources and wetlands due to runoff and wind erosion	Maintain road surface to minimise erosion and runoff	Maintenance Plan	After construction. Maintained throughout operation.
<b>Groundwater</b>					
Construction	Removal of topsoil	Clearing topsoil for footprint areas can increase infiltration rates of water to the groundwater system.	Ensure that footprint clearance is kept to a minimum and that the area is not over-cleared.	Soil Utilisation and Management Plan	Immediately. Maintained throughout construction.
Construction	Hydrocarbon, fuel or chemical handling and spillage	Handling of waste and transport of building material can cause various types of spills (domestic waste, sewage water, hydrocarbons) which can infiltrate and contaminate of the groundwater system.	Waste should be discarded in an allocated waste area. Spills should be cleaned up immediately. Solid waste must similarly either be stored at site on an approved waste disposal area or removed by credible contractors.	Waste Management Plan Hydrocarbon Handling Procedure	
<b>Freshwater Ecosystems</b>					
Construction	Road construction	Loss of wetland and aquatic habitat.	Ensure that as far as possible that infrastructure is placed outside of delineated watercourse areas and their associated zones of regulation. Ensure that sound environmental management is in place during the construction phase. Design of infrastructure should be environmentally and structurally sound and all possible precautions taken to prevent spillage and/or seepage to the surface resources present. Limit the footprint area of the construction activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils. Wetland areas should be fenced off and should be designated as No-go areas for all unauthorised personnel.	NWA. General Authorisation NEM:BA. GNR 1020. MNCA. CITES. Terrestrial Biodiversity Management Plan. Wetland Management Plan Soil Utilisation and Management Plan	Immediately. Maintained throughout construction.
Construction	Road construction	Fragmentation of watercourses.	Pipe culverts are not to be allowed at any watercourse crossings to limit opportunities of flow confinement		



PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
			and channel incision of the wetland units and drainage lines.		
Construction	Removal of vegetation	Disturbance and degradation of wetland and aquatic habitat.	<p>Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation.</p> <p>All erosion noted within the project footprint should be remedied immediately and included as part of an ongoing maintenance plan.</p> <p>Active revegetation of denuded areas immediately after construction activities.</p> <p>Implement and maintain alien vegetation management programme.</p> <p>All delineated watercourses should be designated as "No-Go" areas and be off limits to all unauthorised vehicles and personnel, with the exception of approved construction areas.</p> <p>No vehicles or heavy machinery may be allowed to drive indiscriminately within any delineated watercourses.</p> <p>All vehicles must remain on demarcated roads and within the project footprint.</p> <p>No material may be dumped or stockpiled within delineated watercourses.</p> <p>A suitable dust control program should be put in place.</p>		
Construction	Removal of topsoil	Increased sediment transport and deposition in wetland and aquatic habitat.	<p>Measures must be put in place to attenuate water and reduce runoff.</p> <p>Attenuation measures during construction are to include but are not limited to - the use of sandbags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.</p> <p>Delay vegetation clearing and clear only the minimum area required at any one time.</p> <p>Ensure soil management and stormwater management are implemented and maintained to minimise erosion and sedimentation.</p> <p>All erosion noted within the project footprint should be remedied immediately and included as part of an ongoing maintenance plan.</p> <p>Active revegetation of denuded areas immediately after construction activities.</p>		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
			<p>Ensure that no incision and canalisation of the wetland features present takes place as a result of the proposed activities.</p> <p>Erosion berms should be installed on roadways to prevent gully formation and siltation of the freshwater resources.</p>		
Construction	Hydrocarbon, fuel or chemical handling and spillage	Water quality deterioration.	<p>Ensure that as far as possible that all construction activities are placed outside of wetland/riparian areas and their associated 32 or 100 m zones of regulation, respectively.</p> <p>All vehicles must be regularly inspected for leaks. Vehicles are to be maintained in good working order so as to reduce the probability of leakage of fuels and lubricants.</p> <p>Storage of potentially hazardous materials (including but not limited to fuel, oil, cement, bitumen etc.) must be above any 100-year flood line or outside the designated watercourse buffer, whichever is greater. Re-fuelling must take place on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil.</p> <p>All spills should be immediately cleaned up and treated accordingly.</p> <p>Should contaminated water due to spillages or other unforeseen circumstances enter identified wetland or watercourse, a wetland/aquatic specialist must be consulted regarding implementation of suitable mitigation and/or rehabilitation measures.</p> <p>Appropriate sanitary facilities must be provided for the duration of the construction activities and all waste must be removed to an appropriate waste facility. Under no circumstances may ablutions occur outside of the provided facilities.</p>		
Construction	Road construction	Increased surface water runoff into wetland and aquatic habitat.	<p>Replaced soils should be appropriately shaped and profiled to the natural landscape profile and should be free draining.</p> <p>Steep slopes should be avoided to prevent erosion. As much vegetation growth as possible should be promoted during the construction phase.</p> <p>In order to protect soils, vegetation clearance should be kept to a minimum.</p>		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
			All areas where active erosion is observed should be ripped, re-profiled and seeded with indigenous grasses endemic to the region.		
Construction	Removal of vegetation	Invasive alien plant species encroachment.	An alien vegetation management plan to be implemented and managed for the duration of construction activities. The alien vegetation management plan should remain in place and form part of a maintenance plan.		
Construction	Road construction	Buffer zone impacts.	No activities are to be located within the final designated buffer zone areas. Indigenous vegetation cover within the designated buffer zones is to be maintained at a minimum of 80% to ensure that the buffer remains functional.		
Operation	Hydrocarbon spillages	Deterioration of water quality due to hydrocarbon spillages	Stormwater off the road surface must be discharged into vegetated swales rather than directly into adjacent wetland or water resources. Emergency response to spillages of hazardous substances along the route should also be well defined and tested regularly to ensure rapid response.	Maintenance Plan	After construction. Maintained throughout operation.
<b>Terrestrial Biodiversity</b>					
Construction	Road construction	Removal of vegetation and basal layer. Increased proliferation of AIPs. Increased faunal casualties. Increased dust pollution.	Keep site clearing to a minimum. If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events. Staff of the contracting engineer must adhere to policies and plans, such as adhering to designated speed limits. Restoration and rehabilitation of removed vegetation and SCC post construction. Construction must be kept within the infrastructure footprint area, to reduce as much fragmentation as possible. AIPs should be continuously monitored and controlled throughout the construction phase.	NEM: BA. GNR 1020. MNCA. CITES. Terrestrial Biodiversity Management Plan.	Immediately. Maintained throughout construction.
Construction	Heavy machinery and vehicle movement	Heavy machinery utilised increasing vehicle movement in the area, increasing soil compaction, habitat disturbances and vegetation removal. Natural vegetation will be removed for the road construction promoting edge effects and AIP	Restoration and rehabilitation of removed vegetation and SCC during rehab phase. Construction must be kept within the infrastructure footprint area, to reduce as much fragmentation as possible.		

PHASE	ACTIVITY	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION MEASURES	COMPLIANCE STANDARD	TIME PERIOD FOR IMPLEMENTATION
		proliferation. Increased dust pollution and erosion.	Alien invasive plants should be continuously monitored and controlled throughout the life of the mine and thereafter. Corridors (infrastructure and ecological) set aside within the mine area would mitigate fragmentation substantially, especially if this could be managed with the community over an extended period of time.		
Operation	Road operation	Displacement of fauna and bird's doe to traffic noise	Apply road calming structures, such as speed bumps, where practically implementable, to reduce speed and potential road mortalities.	Maintenance Plan	After construction. Maintained throughout operation.
Operation	Road operation	Faunal mortalities of fauna and birds along road route	Apply road calming structures, such as speed bumps, where practically implementable, to reduce speed and potential road mortalities.		
Operation	Road operation	Changes to the fauna and flora composition and habitat structure due to changes caused in surface hydrology	Monitor to detect change and efficacy of water management structures.		
<b>Palaeontology</b>					
Construction	Road construction	Impact on palaeontological (fossil) finds.	If fossil remains are discovered construction must cease immediately. Implement the Chance Find Protocol. Any discoveries ought to be protected (if possible, in situ) and a report must be submitted to SAHRA so that appropriate mitigation (recording and collection) can be carried out by a palaeontologist.	Chance Find Procedure	Immediately.

## **7 IMPACT MANAGEMENT OUTCOMES**

The impact management outcomes, identifying the standard of impact management required for the aspects identified is provided in **Table 7.1**.

**Table 7.1: Impact Management Outcomes.**

PHASE	ACTIVITY	ASPECT (CAUSE)	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION TYPE	COMPLIANCE STANDARD	MANAGEMENT OUTCOME
<b>Air Quality</b>						
Construction	Removal of topsoil	Liberation of dust	Dust-fall rates exceeding the residential guideline of 600 mg/m <sup>2</sup> /day.	Control	NEM:AQA GNR 827	Limited dust liberation as a result of construction and operational activities.
Construction	Heavy machinery and vehicle movement	Liberation of dust	Dust liberation as a result of vehicular and machinery use and movement.	Control	SANS 1929: 2011 Air Quality Management Plan	
Construction	Road construction	Liberation of dust	Dust liberation as a result of construction activities.	Control		
Construction	Removal of vegetation	Liberation of dust	Dust liberation as a result of wind.	Remedy		
Construction	Removal of topsoil	Liberation of dust	Dust liberation as a result of soil handling.	Manage		
<b>Soil, Land Use and Land Capability</b>						
Construction	Removal of vegetation	Loss of Fertile topsoil	Loss of fertile topsoil due to vegetation clearance. Increased susceptibility to erosion due to removal of vegetation cover. Increased soil erosion due to vegetation clearance.	Manage	Soil Utilisation and Management Plan NEM:WA	To manage soil use and to reduce erosion and soil contamination.
Construction	Road construction	Loss of Fertile topsoil	Loss or reduction in soil fertility due to activities connected to road construction.	Manage		
Construction	Heavy machinery and vehicle movement	Soil surface compaction	Compaction of soil surface due to various activities and vehicular and machinery use and movement.	Control		
Construction	Hydrocarbon, fuel or chemical handling and spillage	Soil contamination	Contamination of soil due to chemical or affected water spillages.	Control		
Construction	Road construction	Terrain alterations	Alteration in prevailing terrain due to construction activities.	Control		
Construction	Removal of topsoil	Agricultural potential loss	Loss of soil with an arable agricultural potential due to the removal of soils.	Manage		
Construction	Removal of topsoil	Altered landscape	Change in natural landscape due to soil removal.	Manage		
Operation	Hydrocarbon spillages	Soil pollution	Pollution of gravel road through spillages	Manage		
Operation	Heavy machinery and vehicle movement	Soil compaction	Compaction of soil due to road use	Manage		
Operation	Maintenance	Soil erosion	Soil erosion due to increase in denuded areas	Control		
<b>Heritage</b>						
Construction	Road construction	Low significant sites impact	No impact is expected on low significant sites (PP 38, PP 39 & PP 41).	Manage	NHRA Palaeontological and Heritage Management Plan	To maintain approved buffer zones and have no impact on heritage sites.
Construction	Road construction	Graves and burial grounds impact	Impact on Graves and Burial Grounds (PP 5 & PP 31)	Control		
Construction	Road construction	Homestead and structures impact	Impact on historic homesteads and structures with the possible risk for unmarked graves (PP 6 & PP 32).	Manage		
Construction	Road construction	Historic farmsteads and structures impact	Impact on historic farmsteads and historical structures (PP 30).	Manage		
Construction	Road construction	New graves discovery	Chance finds of a potential grave during construction.	Stop		

PHASE	ACTIVITY	ASPECT (CAUSE)	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION TYPE	COMPLIANCE STANDARD	MANAGEMENT OUTCOME
Construction	Road construction	New graves discovery	Accidental discovery of graves during construction.	Stop		
Construction	Road construction	Palaeontology finds	Impact on paleontological (fossil) finds.	Stop		
Operation	Maintenance	Heritage sites impact	Encroachment on heritage sites due to maintenance activities	Control	Maintenance Plan	
<b>Traffic</b>						
Construction	Road construction	Heavy traffic on adjacent road network	An increase in traffic on the adjacent road network.	Control	Traffic Management Plan	To ensure safe operating conditions for the road.
Construction	Road construction	Travel time	Changes in travel time.	Remedy		
Construction	Road construction	Heavy vehicles on gravel roads	Additional heavy vehicles on gravel roads.	Control		
Construction	Road construction	Road Safety	Impact on road safety.	Manage		
Operation	Road operation	Traffic volumes and road safety	Increase in traffic volumes and road safety infringements	Manage		
<b>Noise</b>						
Construction	Road construction	Noise nuisance	Noise disturbance and noise nuisance at rural noise sensitive receptors	Control	SANS 10328: 2008 SANS 10103: 2008 SANS 10210: 2004 Noise Management Plan	To address noise nuisance at source immediately.
Operation	Road operation	Noise nuisance	Increase in noise nuisance	Manage	Maintenance Plan	
<b>Visual</b>						
Construction	...	Visual impact on sensitive receptors	Day and night-time visual impact on the surrounding sensitive receptors	Remedy	Visual Impact Management Plan	To have a minimal visual impact.
Construction	Road construction	Visual on sensitive receptors	The visual impact of dust on the surrounding sensitive receptors	Remedy		
<b>Social</b>						
Construction	Road construction	Change in social dynamics	Change in social dynamic of resident communities	Control	Procurement Policy Communication Strategy	To promote local procurement and ensure economic benefits to the local community or LM.
Construction	Road construction	Land use changes	Change in land use	Control	Traffic Management Plan	
Construction	Road construction	Traffic increases	Increase in traffic and heavy machinery or vehicles on roads	Manage	NEM: AQA. GNR 827.	
Construction	Road construction	Safety and security	Increase in crime	Manage		
Construction	Road construction	Health impact	Impact of dust fallout on the livelihoods of the agricultural community. Health impacts such as asthma, sinusitis, allergies and other respiratory diseases attributed to dust generation.	Control	SANS 1929: 2011. Air Quality Management Plan. Health and Safety Plan	
Construction	Road construction	Health and safety	Overall health and safety risk of workers	Manage		
Construction	Road construction	Sense of place	Change in sense of place	Manage		
Construction	Road construction	Labour	Gender division of labour	Control		

PHASE	ACTIVITY	ASPECT (CAUSE)	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION TYPE	COMPLIANCE STANDARD	MANAGEMENT OUTCOME
<b>Surface Water</b>						
Construction	Removal of topsoil	Surface water siltation	Siltation of wetlands and water resources	Control	Surface Water Management Plan Hydrocarbon Handling Procedure	To ensure that surface water resources are not polluted through spillages of sedimentation.
Construction	Heavy machinery and vehicle movement	Surface water pollution	Pollution of surface water due to spillages, seepages or leaks and improper waste handling, storage and disposal.	Control		
Construction	Road construction	Surface water drainage patterns and slopes altered	The construction of the road and stormwater management infrastructure have the potential to alter the sites natural, pre-existing surface water drainage patterns influencing the volume of water that enters the receiving environment.	Control		
Construction	Road construction	Erosion and sedimentation entering receiving surface water bodies	Alteration of the natural pre-existing surface water drainage patterns and slopes of the area may result in increased erosion and sedimentation which may enter receiving surface water bodies.	Manage		
Construction	Road construction	Flooding risk	Due to the close proximity to wetlands and drainage lines the risk of flooding exists.	Manage		
Operation	Road operation	Surface water sedimentation	Sedimentation of surface water resources and wetlands due to runoff and wind erosion	Manage	Maintenance Plan	
<b>Groundwater</b>						
Construction	Removal of topsoil	Infiltration to groundwater system	Clearing topsoil for footprint areas can increase infiltration rates of water to the groundwater system.	Manage	Soil Utilisation and Management Plan Waste Management Plan Hydrocarbon Handling Procedure	To limit impact on the local groundwater regime.
Construction	Hydrocarbon, fuel or chemical handling and spillage	Infiltration to groundwater system	Handling of waste and transport of building material can cause various types of spills (domestic waste, sewage water, hydrocarbons) which can infiltrate and contaminate of the groundwater system.	Manage		
<b>Freshwater Ecosystems</b>						
Construction	Road construction	Loss of wetland and aquatic habitat.	Loss of wetland and aquatic habitat.	Manage	NWA. General Authorisation NEM: BA. GNR 1020. MNCA. CITES. Terrestrial Biodiversity Management Plan. Wetland Management Plan Soil Utilisation and Management Plan	To prevent loss, damage and destruction of wetlands.
Construction	Road construction	Fragmentation of watercourses.	Fragmentation of watercourses.	Manage		
Construction	Removal of vegetation	Disturbance and degradation of wetland and aquatic habitat.	Disturbance and degradation of wetland and aquatic habitat.	Control		
Construction	Removal of topsoil	Sediment transportation and deposition	Increased sediment transport and deposition in wetland and aquatic habitat.	Manage		
Construction	Hydrocarbon, fuel or chemical handling and spillage	Water quality deterioration	Water quality deterioration.	Manage		
Construction	Road construction	Increased surface water runoff	Increased surface water runoff into wetland and aquatic habitat.	Manage		



PHASE	ACTIVITY	ASPECT (CAUSE)	POTENTIAL IMPACT (EFFECT ON ENVIRONMENT)	MITIGATION TYPE	COMPLIANCE STANDARD	MANAGEMENT OUTCOME
Construction	Removal of vegetation	Invasive alien plant species encroachment.	Invasive alien plant species encroachment.	Control		
Construction	Road construction	Buffer zone impacts.	Buffer zone impacts.	Manage		
Operation	Hydrocarbon spillages	Water quality deterioration	Deterioration of water quality due to hydrocarbon spillages	Manage	Maintenance Plan	
<b>Terrestrial Biodiversity</b>						
Construction	Road construction	Influence on terrestrial biodiversity	Removal of vegetation and basal layer. Increased proliferation of AIPs. Increased faunal casualties. Increased dust pollution.	Manage	NEM: BA. GNR 1020. MNCA. CITES.	To minimise faunal and floral impacts.
Construction	Heavy machinery and vehicle movement	Influence on terrestrial biodiversity	Heavy machinery utilised increasing vehicle movement in the area, increasing soil compaction, habitat disturbances and vegetation removal. Natural vegetation will be removed for the road construction promoting edge effects and AIP proliferation. Increased dust pollution and erosion.	Manage	Terrestrial Biodiversity Management Plan.	
Operation	Road operation	Faunal displacement	Displacement of fauna and bird's due to traffic noise	Control	Maintenance Plan	
Operation	Road operation	Faunal mortalities	Faunal mortalities of fauna and birds along road route	Control		
Operation	Road operation	Faunal and floral composition	Changes to the fauna and flora composition and habitat structure due to changes caused in surface hydrology	Manage		
<b>Palaeontology</b>						
Construction	Road Construction	Palaeontological finds	Impact on paleontological (fossil) finds.	Stop	Chance Finds Procedure.	To prevent loss of palaeontological resources.

## 8 MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON

### 8.1 Air Quality

It is proposed that dust fallout monitoring be undertaken along the proposed route to monitor dust fallout levels against acceptable standards. This must be done in accordance with the ASTM standard, D 1739 – 2010. At each gravimetric dust fallout gauge/receptor point there must be a stand built according to specification containing the dust sample collection bucket. Samples must be collected after a 1 month running period ( $\pm 30$  day's exposure). After sample collection, the samples must be taken to a South African National Accreditation System (SANAS) accredited laboratory for analysis.

Dust buckets of a standard size and shape must be prepared and set up at locations related to the eight main compass points on the borders of the property so that dust can settle in them for periods of  $30 \pm 2$  days. The dust buckets must be sealed and replaced with new empty ones and sent away to the SANAS accredited laboratory for analysis. The masses of the water-soluble and – insoluble components of the material collected must then determine and results are reported as milligrams per square metre per day ( $\text{mg}/\text{m}^2/\text{day}$ ). This methodology is described according to South African National Standards (SANS) 1929:2004 and the American Society for Testing and Materials (ASTM) Designation: D 1739-98 (2010). The results for this method of testing are obtained by gravimetric weighing. The apparatus required include open top buckets/containers not less than 150 millimetres (mm) in diameter with a height not less than twice its diameter. The buckets are be placed on a stand at a height of  $2 \pm 0.2$  m above the ground.

### 8.2 Terrestrial Biodiversity

A monitoring programme is essential as a management tool to detect negative impacts and variations as they arise and ensure that the necessary mitigation measures are implemented together with the effectiveness of the management measures in place. **Table 8.1** describes the monitoring plan that NBC intend to implement for the greater area. The area along the road route is included in this plan. The program includes each element, frequency of monitoring and the person responsible thereof.

**Table 8.1: Terrestrial Biodiversity Monitoring Plan.**

MONITORING ELEMENT	COMMENT	FREQUENCY	RESPONSIBILITY
Alien Invasive Management	During the operational phase the presence of AIPs should be detected and monitored. An active programme of weed management, to control the presence and spread of invasive weeds, will need to be instituted so that encroaching weeds (from edge effects and fragmentation) are controlled by means appropriate to the species. This should run for the life of the mine and five years after rehabilitation.	Annually during the wet season for the first five years after rehabilitation.	Environmental Officer
Vegetation Cover Monitoring	The natural vegetation cover established on the disturbed areas needs to be monitored annually for the first five years after rehabilitation has been carried out, to ensure that the rehabilitation work has been successful in terms of stabilising the newly formed surfaces (preventing air and water erosion from affecting those surfaces), and that the newly established vegetation cover is trending towards convergence with the original vegetation cover found on the areas prior to disturbance (and on adjacent undisturbed areas). Parameters to be followed during monitoring: <ul style="list-style-type: none"> <li>• Plant species present/absent;</li> <li>• Weed species composition;</li> <li>• Species density (number of individuals);</li> <li>• Species frequency (number of times species is recorded);</li> <li>• Basal cover; and</li> <li>• Biomass for ground cover.</li> </ul>	Annually during the wet season for the first five years after rehabilitation.	Botanist / Flora Specialist
Red Data listed fauna and flora	All protected and Red Data plant and animal species must be marked prior to any construction taking place.	Monitored annually	Field Specialist
Fauna monitoring	This will be closely linked to the flora monitoring to enable scientific conclusions	Monitored annually	Field Specialist

MONITORING ELEMENT	COMMENT	FREQUENCY	RESPONSIBILITY
	<p>and comparisons. To successfully monitor faunal and floral biodiversity with a Savannah biome, a solid baseline (pre-construction) will be established through the first round of monitoring. This needs to be supplemented with regular repeats to compile a reasonable comparison between the pre-construction faunal communities present and faunal communities found in the same areas during various stages of construction and operation of the proposed project. It is recommended that this monitoring be carried out through the life of the mine and concurrently during rehabilitation.</p>		

### 8.3 Freshwater Ecosystems

A long-term biomonitoring program has been in place at NBC, for some time already. It is recommended that the biomonitoring program be continued with, and that biomonitoring be undertaken for the wet and dry season annually.

Due to the presence of numerous wetland areas in the greater area, the Wet-health and Wet-Ecosystems tools are to be used to re-evaluate PES and eco-services on an annual basis by a suitably qualified wetland specialist for the life of the proposed project. In addition to these tools, vegetation transect monitoring of the various HGM units should take place on an annual basis by a suitably qualified wetland specialist with a strong botanical background to monitor any changes to the vegetation structure of the wetlands as a result of subsidence or moisture stress.

**Table 8.2** presents the mechanisms for monitoring compliance with and performance against the environmental management plan including the impact requiring monitoring, the functional requirement for monitoring, the responsible person(s) for executing the monitoring programme, and the monitoring and reporting frequency.

**Table 8.2: Mechanisms to Monitor Compliance and Performance against the EMP.**

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Construction	Dust Fallout	Gravimetric Dust Fallout. This should form part of the larger management programme of NBC.	Field specialist SANAS accredited laboratory	Monthly for the duration of the construction phase.
Construction	Alien Invasive Management	Implement an active programme of weed management, to control the presence and spread of invasive weeds. This should form part of the larger management programme of NBC.	Environmental Officer	Annually during the wet season for the duration of the construction phase.
Construction	Vegetation Cover Monitoring	The natural vegetation cover established on the disturbed areas needs to be monitored part of the larger management programme of NBC.	Botanist/Flora Specialist	Annually during the wet season for the first five years after rehabilitation.
Construction	Biomonitoring	Water quality, habitat integrity, macroinvertebrates, fish, diatoms. This should form part of the larger management programme of NBC.	Aquatic Ecologist	Annual basis during the summer/wet monitoring season.
Construction	Wetlands	Wet-health and Wet-Ecoservices tools are to be used to re-evaluate PES and eco-services. This should form part of the larger management programme of NBC.	Wetland Specialist	Annual basis during the summer/wet monitoring season.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Construction	Wetlands	Vegetation transects monitoring of the various HGM units. This should form part of the larger management programme of NBC.	Wetland Specialist	Annual basis



## **9 FREQUENCY OF THE SUBMISSION OF PERFORMANCE ASSESSMENT OR AUDIT REPORT**

The NEMA EIA Regulations, 2014 (as amended) state that a performance assessment or audit should be conducted by an external independent person throughout the life of mine at intervals stipulated in the IEA. The performance assessment or audit is a tool used to assess compliance to the EMP and IEA, with specific focus on the adequacy of the mitigation outcomes and objectives. Any amendments to the EMP that may be required following the performance assessment or audit will be undertaken in terms of the NEMA EIA Regulations, 2014 (as amended).

NBC commits to undertake the performance assessment or audit for the road route on a biannual basis.

## **10 ENVIRONMENTAL AWARENESS AND EMERGENCY RESPONSE PLAN**

An environmental awareness and emergency response plan is a dynamic plan that will be used by NBC to ensure that all personnel, contractors, and visitors to the mine undertake their tasks in an environmentally conscious manner. The aim of the plan is to inform all personnel, contractors, and visitors of environmental policies and procedures applicable to activities associated with the road realignment. The plan addresses how NBC will communicate environmental aspects regarding the road realignment as well as how emergency incidents will be responded to by NBC.

### **10.1 Communication, Participation and Consultation**

NBC have adopted a Standard Operating Procedure (SOP) relating to communication, participation and consultation (SP-NBC-SHE 008). The purpose of the SOP is to outline the processes/methods regarding communication, consultation and participation, to be followed by NBC to encourage participation in good Safety, Health and Environment (SHE) practices and support for NBCs SHE policy and SHE objectives from those affected by its activities or interested in NBCs SHE management system. The SOP is provided in **Appendix A**.

#### **10.1.1 Method of Communication**

##### **10.1.1.1 Induction**

All full time personnel and contractors are required to attend an induction session. Personnel are inducted when they start on the project. Any contractor who works on the project for a period of

24 hours or more is required to undergo the prescribed induction training. This induction will form part of the health and safety induction.

Environmental issues and aspects related to the project will be addressed in the induction sessions. All environmental impacts and aspects and their mitigatory measures will be discussed, explained, and communicated to employees. The induction sessions will be modified according to the level of employee attending the induction session so that all employees gain a suitable understanding of environmental issues and pollution.

The records of all individuals attending induction sessions to be kept; the records to be kept include names, identity numbers, contact details, designation, and signature.

### ***10.1.2 On the Job Training***

On the job training is an essential tool in environmental awareness. Employees and contractors will be given details of the expected environmental issues and concerns specifically related to their occupation. Employees and contractors will be trained on how to respond if an environmental problem or source of environmental pollution arises. The training will be on-going, and all new employees will be provided with the same standard of training as existing employees.

The records of all individuals receiving on the job training to be kept; the records to be kept include names, employee number contact details, designation and signature.

#### **10.1.2.1 Hazardous Substances**

Individuals dealing with potential hazardous situations and risks that could lead to hazardous spills, pollution incidents, excessive dust, or other forms of environmental damage to receive appropriate job specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. All these actions will be done in accordance with NBC procedures on management of hazardous substances.

#### **10.1.2.2 Delivery of Hazardous Substances**

All hazardous substances must be delivered directly to the the specified department that placed the order. Personnel responsible for the supervision of delivery, collection, and transport of hazardous substances to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. This all makes part of competency

declaration for use. Material Safety Data Sheets (MSDSs) of each hazardous substance delivered must be kept at the and maintained by the responsible Head of Department (HOD) of that area as well as at the point of distribution. Prior to any use of a new chemical, the Material Safety Data Sheet of each substance must be delivered to the Safety, Health, Environment and Quality department of NBC for approval of use.

#### 10.1.2.3 Dust Mitigation

Individuals dealing with potential situations and risks that could lead to excessive dust to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.

#### 10.1.2.4 Fire Incidents

Individuals dealing with situations and risks that could lead to fire incidents or emergencies to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.

#### 10.1.2.5 Pollution Incidents or Forms of Environmental Damage

Any incident or form of environmental damage must be dealt with in accordance with an incident management procedure.

Individuals dealing with potential situations and risks that could lead pollution incidents or other forms of environmental damage to receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.

#### 10.1.2.6 Waste Management

Contractors responsible for the operation and safe handling of waste streams will receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation. Ensure that training and awareness programmes cover the safe transportation, handling, storage, transfer, handling, use and disposal of all waste streams, and the location of waste receptacles for each waste stream. All waste management activities must be

done in accordance with NBC procedures and in terms with registers dealing with storage of waste in specific areas.

Staff awareness training programme will accommodate training, on which bin to use for organic waste and on sealing the lid on the bin once organic waste has been discarded.

#### 10.1.2.7 Water Management

All persons responsible for active water management will receive appropriate job-specific training on the risks and potential consequences of their appointment and work situation, how to avoid environmental impacts and how to respond during an environmental incident or emergency situation.

#### 10.1.2.8 Water Consumption and Use

All staff will receive awareness training on minimising water consumption and how to use water sparingly.

### **10.1.3 Environmental Communication Strategies**

NBC has established procedures for the internal communication between the various levels and functions of the organisation, and receiving, documenting, and responding to environmental risks for each phase of the project will take place for the management, administrative and worker sectors of the project, as well as contractors. The organisation shall conduct processes for external communication on its significant environmental aspects and record its decision in line with the NBC communication policy as well as conditions stated in any authorisation.

#### 10.1.3.1 Internal Communication

Internal communication is done within the Administrative Sector.

#### 10.1.3.2 External Communication Strategies

The following communication channels will/can be used to communicate environmental issues to individuals who are not employed by NBC or their subcontractors:

- **Environmental Stakeholder Engagement Meeting:** An environmental stakeholder engagement meeting may be established and used as a forum to keep interested and affected parties informed of the significant environmental aspects identified through the Environmental Impact Assessments and Management Plans. This is also the forum where

interested and affected parties get the opportunity to raise environmental concerns. Records are kept of all decisions and concerns. The environmental stakeholder engagement meeting should be chaired by the General Manager, or another appropriately appointed competent individual.

- **Publications:** Selected publications should be produced and used to communicate environmental issues to outside parties. Examples include newsletters and Annual Reports.
- **Communication from External Parties and Employees:** A clear communication point is established within the company through the SOP that determines who is responsible for liaison with the media in respect of any crisis that may arise. Communication from external interested and affected parties may be received by email, fax, or telephonically. Where required, a written response will be sent, on receiving such communication, by the appropriately appointed individual under signature of the General Manager, to the respective interested and/or affected party. All telephonic or facsimile correspondence received on the mine must be forwarded to the relevant department for action. All events or concerns will be captured and actioned on an existing and/or future database.
- **E-mail:** E-mail communication received must be stored, with replies, in an appropriate folder on a server. E-mail messages, relevant to environmental management, should be kept for a minimum of two years before deletion.
- **Mail:** Correspondence received by mail must be filed, along with the response (where relevant), within the relevant department's filing system for a minimum period of two (2) years. Paper correspondence will be archived in this department.
- **Telephone:** A register of telephonic environmental queries should be kept by the relevant department detailing caller, contact details, date, query, action taken and response. Furthermore, the person answering the call will be responsible for logging their particulars against the call, as well as ensuring that all communication that leads to an aspect or an impact, is entered on the database.
- **Storage of Correspondence:** All original correspondence must be retained by the General Manager for a minimum period of two years.
- **Environmental Reports:** Copies of relevant specialist study reports and Environmental Impact Assessments will be available on request from an external party by the General Manager.
- **Queries from Interested and Affected Parties:** Response to queries about environmental impacts and aspects will be addressed by the relevant department and approved by the General Manager.
- **Queries and Requests from the Media:** Requests for articles from the media on environmental issues regarding the road construction will be co-ordinated by the Corporate Communication manager according to the public communication strategy, with input from the relevant department, as approved by the General Manager, in line with community



communication and liaison strategies. Due to the environmental awareness generated by induction, on the job training etc., employees are able to identify environmental problems, issues, concerns, and pollution timeously.

## **10.2 Evaluation of the Environmental Awareness Plan**

The evaluation of the environmental awareness and training plan will be conducted by NBC. This evaluation will entail the auditing of the operation in the construction phase once activity has commenced. The environmental awareness and training plan described above is sufficient to make all those involved in the project aware of those risks that may occur as well as the necessary mitigation required to minimise these risks.

The environmental awareness and training plan indicates that NBC is serious about the environments well-being and empowerment of the local people. Environmental issue will be highlighted at monthly meetings scheduled at the mine.

## **10.3 Emergency Preparedness and Response**

The purpose of the Emergency Preparedness and Response SOP (SP-NBC-SHE 010) is to provide a framework to ensure that potential emergency situations are identified and responded to, as to prevent or mitigate associated adverse SHE effects. The SOP is provided in **Appendix A**.

## **10.4 Emergency Incident Reporting**

Environmental incident reporting is a vital part of communication at NBC. Employees are required to report any and all environmentally related problems, incidents, and pollution, so that the appropriate litigator action can be implemented timeously. In the event of an environmental incident, the incident must be reported according to the Incident, Nonconformity and Corrective Action SOP (SP-NBC-SHE 012). This SOP outlines the process for reporting, assessing, investigating, implementing and evaluating action(s) taken to prevent reoccurrence. The reporting and investigation of accidents, incidents and nonconformities without undue delay can enable hazards to be eliminated and associated SHE risks being minimised as soon as possible. The SOP is provided in **Appendix A**.

## 11 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Not applicable as no specific information has been requested by the MDARDLEA at this stage.

## 12 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

The EAP herewith confirms-

- a) the correctness of the information provided in the reports;
- b) the inclusion of comments and inputs from stakeholders and I&APs;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.



\_\_\_\_\_  
Renee Janse van Rensburg

**Environmental Compliance and Assessment Manager**

Commodity Inspections Group (Pty) Ltd

21 September 2021

\_\_\_\_\_  
Date



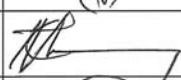


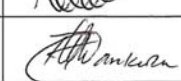
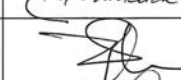


# **ANNEXURE A**

## **STANDARD OPERATING PROCEDURES**

SYSTEM PROCESS

COMMUNICATION, PARTICIPATION AND CONSULTATION

DOCUMENT NUMBER:	SP-NBC-SHE 008
CREATION DATE:	24 January 2020
LAST REVIEW / REVISED DATE:	24 January 2020
REVISION STATUS:	00
DOCUMENT OWNER: Job Title	Health and Safety Manager

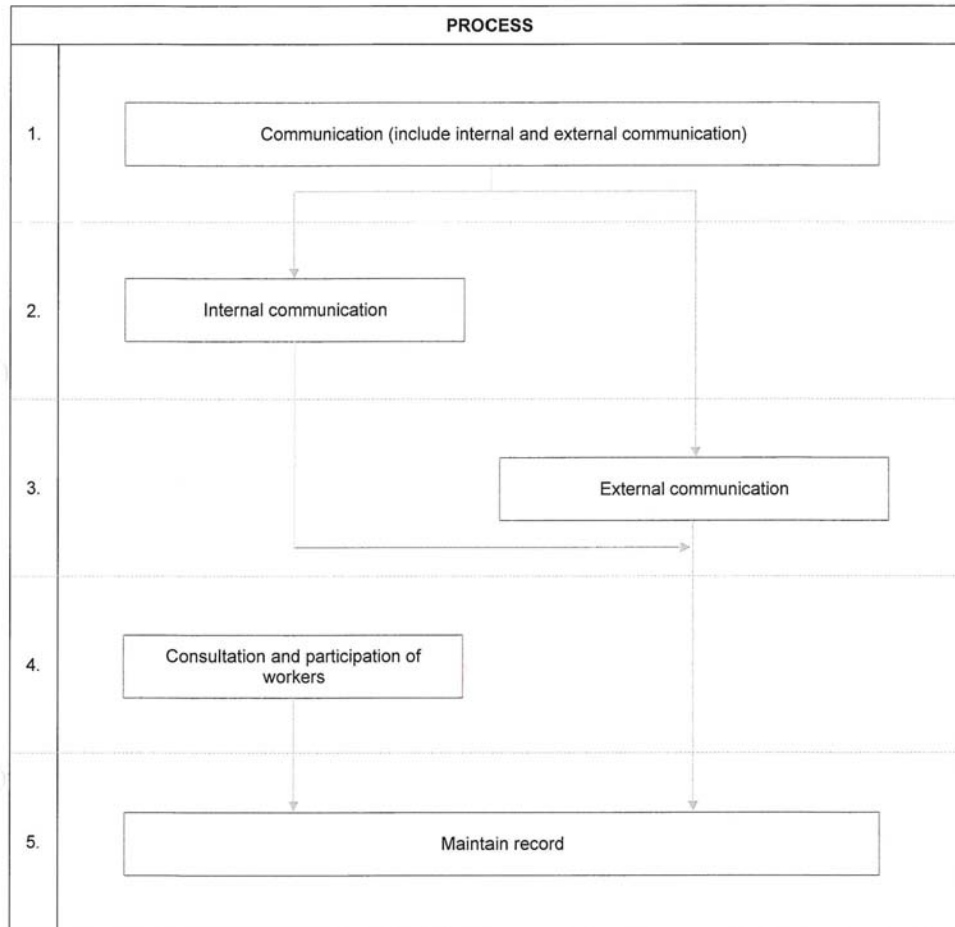
APPROVAL			
NAME	DESIGNATION	SIGNATURE	DATE
R Ngomane	Document Owner		07/02/2020
T Thobedi	Resident Engineer		15/02/2020
K Mahlangu	Mine Manager (Acting)		07/02/2020
R Ngomane	Health and Safety Manager (Acting)		07/02/2020
N Cebekhulu	Environmental Manager		07/02/2020
L Mankuru	Manager, HR		07/02/2020
P Mamba	Manager, Plant		07/02/2020
J Mahlangu	SHE Committee Rep.		07/02/2020
M Musi	General Manager		10/02/2020

OBJECTIVE
The purpose of this process is to outline the processes/methods regarding communication, consultation and participation, to be followed by NBC Colliery to encourage participation in good SHE practices and support for its SHE policy and SHE objectives from those affected by its activities or interested in its SHE management system.

RESPONSIBILITY
<p>The General Manager will:</p> <ul style="list-style-type: none"> <li>• Communicate all relevant SHE information from external interested parties to Head of departments who will disseminate the information amongst their workers.</li> <li>• Communicate with relevant authorities and external interested parties on SHE issues after consultation with applicable mine personnel, where applicable.</li> <li>• Communicate SHE performance issues with relevant Corporate personnel</li> </ul> <p>Head of departments, Site Managers and First line Managers will:</p> <ul style="list-style-type: none"> <li>• Communicate information concerning its SHE risks, legal &amp; other requirements and its SHE management system to those involved in or affected, in order for them to actively participate in, or support the prevention of injury and ill health.</li> <li>• Have processes in place for consultation with employees or contractors, when there are changes that affect their SHE</li> </ul> <p>The Health and Safety Manager, Environmental Manager and Safety Officers will:</p> <ul style="list-style-type: none"> <li>• Ensure that all relevant SHE information is communicated to all employees via meeting, information session, SHE forum meetings, or by means of memorandums, flyers etc.</li> <li>• Communicate SHE performance results to Top Management</li> </ul>

INPUT
<ul style="list-style-type: none"> <li>• Intended outcome(s) of the SHE management system</li> <li>• Applicable requirements (legal and other requirements)</li> <li>• Risks and opportunities</li> </ul>

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Activity	Responsibility	Method		
1. Communication (include internal and external communication)	General Manager, Head of departments, Sections Managers, First line Managers, Safety Manager, Environment Manager and Workers	<p>The organization established and implemented process(es), as per <b>annexure A</b>, needed for the internal and external communications relevant to the SHE management system, including determining:</p> <ul style="list-style-type: none"> <li>• On what it will communicate;</li> <li>• When to communicate;</li> <li>• With whom to communicate:               <ul style="list-style-type: none"> <li>o internally among the various levels and functions of the organization;</li> <li>o among contractors and visitors to the workplace;</li> <li>o among other interested parties;</li> </ul> </li> <li>• How to communicate:               <ul style="list-style-type: none"> <li>o the organization will take into account diversity aspects (e.g. gender, language, culture, literacy, disability), when considering its communication needs.</li> <li>o the organization will ensure that the views of external interested parties are considered in establishing its communication process(es), external interested parties can include corporate, external service providers, visitors, neighbours, emergency services, insurers, community and government or regulatory inspectors and etc.</li> </ul> </li> </ul> <p>When establishing its communication process(es), the organization shall:</p> <ul style="list-style-type: none"> <li>• take into account its legal requirements and other requirements;</li> <li>• ensure that SHE information to be communicated is consistent with information generated within the SHE management system, and is reliable.</li> </ul> <p>The organization shall respond to relevant communications on its SHE management system.</p> <p>Note: The organization's communication processes will provide for the flow of information upwards, downwards and across the organization. It will provide for both the gathering and the dissemination of information. It will ensure that SHE information is provided, received and understood by all relevant persons.</p> <p>The organization will effectively communicate information concerning its SHE risks and its SHE management system to</p>		
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		<p>those involved in, or affected by the management system, in order for them to actively participate in, or support the prevention of injury, ill health or pollution, as applicable.</p> <p>SHE issues will be communicated to employees, visitors and contractors via means such as:</p> <ul style="list-style-type: none"> <li>• SHE briefings and meetings, induction/orientation talks, etc.</li> <li>• Newsletters, posters, emails, suggestion boxes/schemes, websites and notice boards containing information on SHE issues</li> </ul>
2. Internal communication	General Manager, Head of departments, Sections Managers, First line Managers, SHE practitioners and Workers	<p>The organization will:</p> <p>a) internally communicate information relevant to the SHE management system among the various levels and functions of the organization, including changes to the SHE management system, as appropriate;</p> <p>b) ensure its communication process(es) enables workers to contribute to continual improvement.</p> <p>The organization will ensure that following information about SHE risks and the SHE management system are effectively communicate between various functions and levels within the organization:</p> <ul style="list-style-type: none"> <li>• relating to management's commitment to the SHE management system (e.g. programmes undertaken and resources committed to improving SHE performance),</li> <li>• concerning the identification of hazards and risks (e.g. information on process flows, risk assessment tools, materials in use, equipment specifications and observation of work practices),</li> <li>• about SHE objectives and other continual improvement activities,</li> <li>• relating to incident investigation (e.g. the type of incidents that are taking place, factors that can contribute to the occurrence of incidents, results of incident investigations),</li> <li>• relating to progress in eliminating SHE hazards and risks (e.g. status reports showing progress of projects that have been completed or are underway),</li> <li>• relating to changes that can impact on the SHE management system</li> </ul>

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Activity	Responsibility	Method
3. External communication	Head of departments, Site Managers, First line Managers, Environmental Manager and Safety Manager	<p>The organization will externally communicate information relevant to the SHE management system, as established by the organization's communication process(es) and taking into account its legal requirements and other requirements. Communication arrangements regarding external service provider will be done as per <b>annexure A</b>, the organization will generally use contracts to communicate SHE performance requirements, where the consequences associated with nonconformity with SHE requirements will be stipulated.</p> <p>The communication will include information about any operational controls related to the specific tasks to be performed or the area where the work is to be done. This information will be communicated before the external service provider comes onsite and then supplemented with additional or other information (e.g. induction material), as appropriate, when the work starts. The organization will also have processes in place for consultation with external service provider when there are changes that affect their SHE.</p> <p>In addition to the specific SHE requirements for activities carried out onsite the following will also be relevant to the organization when developing its processes for communications with contractors:</p> <ul style="list-style-type: none"> <li>• information about individual contractors' SHE management systems (e.g. their established policies and procedures to address pertinent SHE risks),</li> <li>• the existence of multiple contractors at the worksite,</li> <li>• staffing for accomplishing SHE activities (e.g. exposure monitoring, equipment inspections),</li> <li>• emergency response,</li> <li>• the need for alignment of the contractor's SHE policies and practices with those of the organization and other contractors at the worksite,</li> <li>• requirements for the assessment of conformance with agreed SHE performance criteria,</li> <li>• processes for incident investigation, reporting of nonconformities and corrective action,</li> <li>• processes for hazard identification risk assessment</li> <li>• arrangements for day-to-day communications</li> </ul> <p>For visitors (including delivery people, customers, members of the public, service providers, etc.), communication can include warning signs and security barriers, as well as verbal or written communication.</p>

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Activity	Responsibility	Method
		Information that will be communicated includes: <ul style="list-style-type: none"> <li>• SHE requirements relevant to their visit,</li> <li>• evacuation procedures and responses to alarms,</li> <li>• traffic controls,</li> <li>• access controls and escort requirements,</li> <li>• any personal protective equipment (PPE) that needs to be worn (e.g. safety glasses)</li> </ul>
4. Consultation and participation of workers	Head of departments, Sections Managers, Environmental Manager, Safety Manager and SHE practitioners	<p>The organization established and implemented process(es), as per <b>annexure B</b>, for consultation and participation of workers or their representatives at all applicable levels and functions in the development, planning, implementation, performance evaluation and actions for improvement of the SHE management system.</p> <p>The organization shall:</p> <p>a) provide mechanisms, time, training and resources necessary for consultation and participation;  Note: Worker representation can be a mechanism for consultation and participation.</p> <p>b) provide timely access to clear, understandable and relevant information about the SHE management system;</p> <p>c) determine and remove obstacles or barriers to participation and minimize those that cannot be removed;</p> <p>Note: Obstacles and barriers can include failure to respond to worker inputs or suggestions, language or literacy barriers, reprisals or threats of reprisals and policies or practices that discourage or penalize worker participation.</p> <p>d) emphasize the consultation of non-managerial workers on the following:</p> <ul style="list-style-type: none"> <li>• determining the needs and expectations of interested parties.</li> <li>• establishing the SHE policy.</li> <li>• assigning organizational roles, responsibilities and authorities, as applicable.</li> <li>• determining how to fulfil legal requirements and other requirements.</li> <li>• establishing SHE objectives and planning to achieve them;</li> <li>• determining applicable controls for outsourcing, procurement and contractors;</li> <li>• determining what needs to be monitored, measured and evaluated;</li> <li>• planning, establishing, implementing and maintaining an</li> </ul>

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Activity	Responsibility	Method
		<p>audit programme(s);</p> <ul style="list-style-type: none"> <li>• ensuring continual improvement;</li> </ul> <p>e) emphasize the participation of non-managerial workers in the following:</p> <ul style="list-style-type: none"> <li>• determining the mechanisms for their consultation and participation;</li> <li>• identifying hazards and assessing risks and opportunities;</li> <li>• determining actions to eliminate hazards and reduce SHE risks;</li> <li>• determining competence requirements, training needs, training and evaluating training;</li> <li>• determining what needs to be communicated and how this will be done;</li> <li>• determining control measures and their effective implementation and use;</li> <li>• investigating incidents and nonconformities and determining corrective actions.</li> </ul> <p>Note: Emphasizing the consultation and participation of non-managerial workers is intended to apply to persons carrying out the work activities, but is not intended to exclude, for example, managers who are impacted by work activities or other factors in the organization.</p> <p>Note: It is recognized that the provision of training at no cost to workers and the provision of training during working hours, where possible, can remove significant barriers to worker participation.</p>
5. Maintain record	Head of departments, Sections Managers, First line Managers, Environmental Manager, Safety Manager and SHE practitioners	The organization will retain documented information as evidence of its communications, consultation and participation as appropriate, as per documented system process regarding control of records - SP-NBC-SHE 013.

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OUTPUT
Well defined processes/methods regarding communication, participation and consultation relevant to interested parties

PROCESS PERFORMANCE	
<b>Evaluate Process Performance based on the following indicator(s) (KPI's):</b>	<b>Method/assessment:</b>
<ul style="list-style-type: none"> <li>Collate proactive information through assessments, audits and inspections which indicate that communication, participation and consultation methods are inadequate defined, include response and feedback from employees.</li> <li>Collate reactive information through accidents, incidents and non-conformances which indicate that communication, participation and consultation methods are inadequate defined</li> </ul>	<ul style="list-style-type: none"> <li>Audit(s)</li> <li>Data source and analysis</li> <li>Management review(s)</li> </ul>

REFERENCE
<ul style="list-style-type: none"> <li>ISO 45001:2018 (Clause 5.4 &amp; 7.4)</li> <li>ISO 14001:2015 (Clause 7.4)</li> </ul>

RECORD
<ul style="list-style-type: none"> <li>Communication record, such as minutes of meetings, minutes of communication sessions, presentations, memorandums, bulletins, newsletters, posters and record on notice boards</li> <li>Participation and consultation record such as attendance registers, minutes and etc.</li> </ul>

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HISTORY OF CHANGES MADE TO THE DOCUMENT			
Revision No:	Change Description include References	Date	Approved
00	Initial document	31 September 2019	Health and Health and Safety Manager

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**Annexure A:** Internal and external communication processes

(Arrangements by which the organization communicates pertinent Safety, Health and Environmental information, to and from its employees and other interested parties (e.g. contractors, authorities, community and visitors))

INTERNAL			
On what it will communicate	When to communicate	With whom to communicate	How to communicate
SHE policy	Initially and whenever changes are done	All employees	E-mail, induction/orientation talks, formal meetings, notice boards and daily meetings
Communicating legal and other requirements to persons working under the control of the organization	Initially and whenever changes are done	Relevant employees	E-mails and formal meetings
Communicating applicable SHE risks / impacts to persons working under the control of the organization	Initially, continuously and whenever changes are done	Relevant employees	E-mails, formal meetings, risk assessment sessions and with induction
Communicating progress regarding SHE objectives and management programmes	Initially, continuously and whenever changes are done	Relevant employees	E-mails, formal meetings and notice boards (include management review meeting)
SHE responsibilities, authorities and accountabilities	Initially, continuously and whenever changes are done	Relevant employees	E-mails and formal meetings
Training requirements (Individual development program)	Annually	Relevant employees	Formal discussion
Communication the result of an investigation, corrective action(s) and preventive action(s) taken	After formal investigation session	Relevant employees	E-mails and formal meetings
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Results of emergency practices	After emergency practice was done	Relevant employees	E-mails and formal meetings
Results of internal and external audits (include legal audits)	After internal or external audit was done	Relevant employees	E-mails and formal meetings
Results of management review	After management review was done	Relevant employees	E-mails and formal meetings
Communicate external interested parties complaints or concerns within the organization related to SHE	After complaint or concern was raised	General Manager / Head of Departments	E-mails, formal meetings or informal discussions
Communicating monitoring and measuring results (SHE stats / graphs and data)	After monitoring and measuring were done	Head of Departments	E-mails and daily meetings
Safety, Health and Environmental talk topics	Monthly	Relevant employees	E-mails / offices / notice boards and daily , formal meetings
Results of the SHE management system performance (such as risk assessment process, document control process, internal audit process and etc.)	Monthly and annually	General Manager / Head of Departments	E-mails and formal meetings

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## EXTERNAL

On what it will communicate	When to communicate	With whom to communicate	How to communicate
Communication from external interested party (include complaints, concerns or recommendations)	<ul style="list-style-type: none"> <li>• Whenever required</li> <li>• Scheduled meeting(s) with interested and affected parties</li> </ul>	SHE practitioner / Security / Environmental Manager	Receive verbal or written complaints, concerns or recommendations from formal and informal meetings with interested and affected parties. Complaints, concerns or recommendations can also be noted in the complaint register at the main gate and change house
Communication with media regarding internal incidents	On request from media	Applicable Media	E-mail or telephonically
Communicate significant SHE impacts subject to external interested parties such as the community and public	Bi-annually / whenever required	Surrounding community and public	Stakeholders meeting and mine wide signage
Environmental authorisations, licenses, permits and the mine's EMPR status / performance	Annually	Relevant environmental authority	Report
Contractor requirements (general issues)	Monthly / whenever required	Relevant contractor	E-mails, informal or formal meetings - Contractor meeting
SAMRASS 1,2 and 9 reports/ Section 11.5 & 54 reports	As and when incident occurs	DMR	E-mail, deliver to the DMR
Annual Medical Report	Annually	DMR	Formal letter and report submitted to the Department

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Annual Hygiene Report	Annually	DMR	Formal letter and report submitted to the Department
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**Annexure B: Participation and Consultation processes**

(Arrangements by which the organization ensure participation and consultation related to Health and Safety matters, with internal and external parties (External parties can include contractors, authorities, community and visitors)

Subject matter	Facilitator	Participant	When	Method
Risk assessments (include change management - changes that can have affect their Health and Safety)	SHE Practitioner, Section Manager or delegated person(s)	Selected employees (most knowledgeable employees)	Initially and continuously	Formal risk assessment session
Accident, incident or non-conformance investigations	SHE Practitioner, Section Manager or delegated person(s)	Selected employees	When required	Formal investigation session
Development and review of the SHE Policy	Safety Department and Environmental Department	Top Management	Initially and subject to the review frequency of the SHE management review	Management meeting(s)
Development and review of SHE objectives	Safety Department, Environmental Department, Head of departments, Site Managers and First line Managers	All relevant employees	Initially and whenever changes are done	Formal sessions

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Development and review of operational procedures or standards	Safety Department, Environmental Department, Head of departments, Site Managers and First line Managers	All relevant employees	Initially and whenever changes are done	Formal sessions
Determining who shall represent employees on SHE matters.	Safety Department and Environmental Department, Head of departments, Site Managers and/or First line Managers	All relevant employees	Initially and whenever changes are done	Employee consultation shall be facilitated through the election of SHE Representatives and SHE Committee(s).



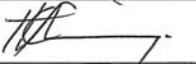






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## SYSTEM PROCESS

### EMERGENCY PREPAREDNESS AND RESPONSE

<b>DOCUMENT NUMBER:</b>	SP-NBC-SHE 010
<b>CREATION DATE:</b>	27 January 2020
<b>LAST REVIEW / REVISED DATE:</b>	27 January 2020
<b>REVISION STATUS:</b>	00
<b>DOCUMENT OWNER: Job Title</b>	Health and Safety Manager

APPROVAL			
NAME	DESIGNATION	SIGNATURE	DATE
R Ngomane	Document Owner		07/02/2020
T Thobedi	Resident Engineer		15/2/20
K Mahlangu	Mine Manager (Acting)		07/02/2020
R Ngomane	Health and Safety Manager (Acting)		07/02/2020
N Cebekhulu	Environmental Manager		07/02/2020
L Mankuru	Manager, HR		07/02/2020
P Mamba	Manager, Plant		07/02/2020
J Mahlangu	SHE Committee Rep.		07/02/2020
M Musi	General Manager		10/02/2020

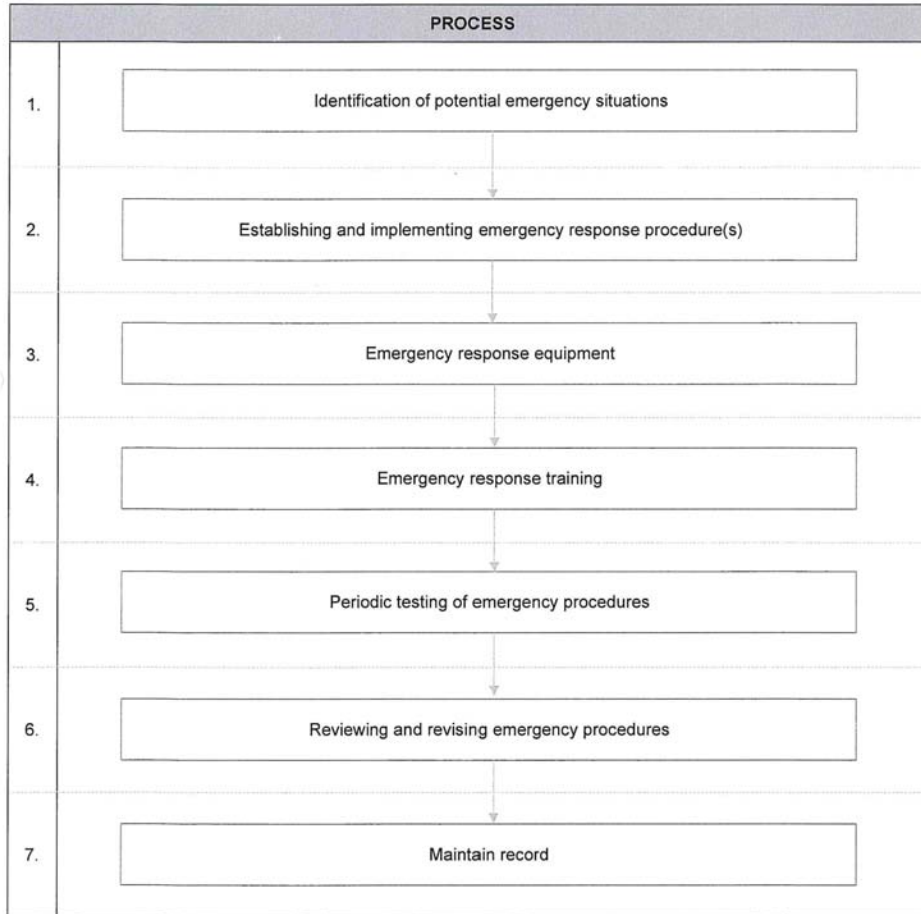
OBJECTIVE OF SYSTEM PROCESS
The purpose of this procedure is to provide a framework to ensure that potential emergency situations are identified and responded to, as to prevent or mitigate associated adverse Health, Safety and Environmental effects.

RESPONSIBILITY
<ul style="list-style-type: none"> <li>Departmental Managers, Section Managers, First Line Managers, Safety Manager and Environmental Manager are responsible to define emergency situations that can impact on the Health and Safety of employees and the wellbeing of the Environment.</li> <li>Departmental Managers, Section Managers, First Line Managers, Safety Manager and Environmental Manager are responsible to develop procedures for an effective response.</li> <li>Departmental Managers, Section Managers, First Line Managers, Safety Manager and Environmental Manager to ensure that emergency preparedness are tested periodically and effectiveness of response activities and procedures are improved, whenever required.</li> <li>Departmental Managers, Section Managers, First Line Managers and Training department are responsible for organizing and co-ordinating in-house and outsourced training to ensure that employees are prepared and competent to handle emergency situations applicable to NBC Colliery.</li> </ul>

INPUT
<ul style="list-style-type: none"> <li>The results of hazard identification and risk assessments</li> <li>Legal requirements</li> <li>The organization's previous incident (including accident) and emergency experience,</li> <li>Emergency situations that have occurred in similar organizations,</li> <li>Information related to accident and/or incident investigations posted on the websites of regulators or emergency response agencies</li> </ul>

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Activity	Responsibility	Method
1. Identification of potential emergency situations	Departmental Managers, Section Managers, First line Managers, Safety Manager, Environmental Manager and SHE practitioners	<p>The organization will assess the potential for emergency situations that can have an impact on the Health and Safety of employees and the wellbeing of the Environment in their area of responsibility and develop procedures for an effective response. The organization will periodically test its emergency preparedness and seek to improve the effectiveness of its response activities and procedures. All significant (high) risks identified through the risk assessment process, will be considered as emergency situations/conditions under accidental conditions.</p> <p>Examples of possible emergencies, which vary in scale, can include:</p> <ul style="list-style-type: none"> <li>• Catastrophic injury;</li> <li>• Catastrophic illness;</li> <li>• Fire, explosions or implosions;</li> <li>• Structural failure;</li> <li>• Essential service failure;</li> <li>• Chemical releases;</li> <li>• Production or material contamination;</li> <li>• High volume material breach (e.g. flooding);</li> <li>• Security (e.g. threats and terrorism)</li> </ul> <p>When identifying potential emergency situations, consideration will be given to emergencies that can occur during both normal (routine) and abnormal (non-routine) conditions/situations (e.g. operation start-up or shutdown, construction or demolition activities). Emergency planning will also be reviewed as a part of the on-going management of change process. Changes in operations can introduce new potential emergencies or necessitate that changes be made to emergency response procedures. For example, changes in facility layout can impact emergency evacuation routes.</p> <p>The organization will determine and assess how emergency situations will impact all persons within and/or in the immediate vicinity of workplaces controlled by the organization. Consideration will be given to those with special needs, e.g. people with limited mobility, vision and hearing. This could include employees, temporary workers, contract employees, visitors, community or other members of the public.</p>

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Activity	Responsibility	Method
		<p>The organization will also consider potential impacts on emergency services personnel while at the workplace (e.g. fire-fighters).</p> <p>Information that will be considered in identifying potential emergency situations includes the following:</p> <ul style="list-style-type: none"> <li>• the results of hazard identification and risk assessments</li> <li>• legal requirements</li> <li>• the organization's previous incident (including accident) and emergency experience,</li> <li>• emergency situations that have occurred in similar organizations,</li> <li>• information related to accident and/or incident investigations posted on the websites of regulators or emergency response agencies</li> </ul>
2. Establishing and implementing emergency response procedures	Departmental Managers, Section Managers, First line Managers, Safety Manager, Environmental Manager and SHE practitioners	<p>Emergency response will focus on the prevention of ill health, injury and pollution, and on the minimization of the adverse Safety, Health and Environment consequences to a person(s) or the Environment exposed to an emergency situation. Procedures for responding to emergency situations will be developed and will also take into account applicable legal and other requirements. The procedure will be clear and brief to facilitate their use in emergency situations. They will also be readily available for use by emergency services. Emergency procedures that are stored on a computer or by other electronic means might not be readily available in the event of a power failure, so paper (hard) copies of emergencies procedure(s) will be maintained in readily accessible locations. Each department will have emergencies procedures in place, indicating the different levels of emergencies and how they will be handled and will be documented as attachments to this document. Roles, responsibilities and telephone numbers of the Management team and emergency team will also be attached to this document.</p> <p>Emergency response procedures will give consideration to the following:</p> <ul style="list-style-type: none"> <li>• Identification of potential emergency situations and locations,</li> <li>• Details of the actions to be taken by personnel during the emergency (including actions to be taken by staff working offsite, by contractors and visitors),</li> </ul>

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Activity	Responsibility	Method
		<ul style="list-style-type: none"> <li>• Evacuation procedure(s),</li> <li>• Responsibilities, and authorities of personnel with specific response duties and roles during the emergency (e.g. fireman, first-aider, staff and spill clean-up specialists),</li> <li>• Taking into account the needs and capabilities of all relevant interested parties and ensuring their involvement, as appropriate, in development of the planned response.</li> <li>• Communication with employees (both onsite and offsite), regulators and other interested parties (e.g. family, neighbours, local community, media),</li> <li>• Information necessary for undertaking the emergency response (plant layout drawings, identification and location of emergency response equipment, identification and location of hazardous materials, utility shut-off locations, contact information for emergency response providers).</li> </ul> <p>The emergency personnel will be formally appointed, either through a formal appointment letter or through extension of roles and responsibilities in an existing appointment letter and these emergency personnel will also be involved in the development of the emergency procedures to ensure they are fully aware of the type and scope of emergencies that they can be expected to handle, as well as the arrangements needed for coordination. Emergency service personnel will be provided with the information required to facilitate their involvement in response activities.</p> <p>Note: A list of emergency telephone numbers will be available at the control room and displayed on notice boards.</p> <p>Consideration will be given to the existence and/or capability of the following, in developing emergency response procedures, attached to this document as attachments:</p> <ul style="list-style-type: none"> <li>• Inventory and location of hazardous materials storage,</li> <li>• Numbers and locations of employees under the control of the organization,</li> <li>• Critical systems that can impact on Safety, Health and Environment.</li> <li>• The provision of emergency training,</li> <li>• Detection and emergency control measures,</li> </ul>

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Activity	Responsibility	Method
		<ul style="list-style-type: none"> <li>• Medical equipment, first aid kits, etc.,</li> <li>• Supporting control systems,</li> <li>• Monitoring systems for hazardous materials,</li> <li>• Fire detection and suppression systems,</li> <li>• Emergency power sources,</li> <li>• Availability of external emergency response services and details of any emergency response arrangements currently in place,</li> <li>• Security planning to consider the need for partial decentralisation of critical activities so that not all critical staff and infrastructure are in one location,</li> <li>• Legal and other requirements,</li> <li>• Previous emergency response experience</li> </ul> <p>When the organization determines that external services are needed for emergency response (e.g. Ambulance service, firefighting or specialist experts in handling hazardous materials), pre-approved (contractual) arrangements will be put in place, after the consultation process, defining the needs and expectations. Details of the procedure for requesting outside assistance and the arrangements for liaising with external emergency services team, will be defined in the particular emergency response procedure. Particular attention will be paid to staffing levels, response schedules and emergency service limitations.</p>
3. Emergency response equipment	Section Managers, First line Managers, Safety Manager, Environmental Manager and SHE practitioners.	<p>The organization will determine and review its emergency response equipment and material needs. Emergency response equipment as listed in the COP regarding Emergency preparedness and response – COP-NBC-SHE004</p> <p>Emergency response equipment and materials can be needed to perform a variety of functions during an emergency, such as evacuation, fire suppression, chemical monitoring, communication (alarm), isolation, containment, personal, protection, decontamination, and medical evaluation and treatment.</p> <p>Emergency response equipment will be available in sufficient quantity and stored in locations where it is readily accessible; it will be stored securely and be protected from being damaged. Emergency response equipment will have equipment register(s) and be inspected and/or tested at regular intervals to ensure</p>

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Activity	Responsibility	Method
		<p>that it will be operational in an emergency situation. Positions of rescue equipment and facilities, will be noted on the equipment register(s). Special attention will be paid to equipment and materials used to protect emergency response personnel. Individuals will be informed of the limitations of personal protective devices and trained in their proper use, as per system process, regarding competency, training and awareness – SP-NBC-SHE007.</p> <p>All firefighting equipment shall receive an annual service by an approved contractor. The contractor shall comply with national standards and regulations regarding firefighting equipment service.</p> <p>The type, quantity and storage location(s) for emergency equipment and supplies will be evaluated as a part of the review and testing of emergency procedures.</p>
4. Emergency response training	Section Managers, First line Managers, Safety Manager, Environmental Manager, SHE practitioners and external service provider(s), where applicable	<p>Training requirements will be determined and managed as per system process - SP-NBC-SHE007, regarding competency, training and awareness. Training include the correct use of emergency response equipment's, training needed for personnel who are assigned emergency response duties and on how to handle emergency situations as per relevant emergency procedures</p> <p>Training needs will be documented on the relevant training needs analysis (TNA)/skills matrix.</p> <p>Refresher training will be undertaken at required frequencies or whenever a modification was made, to ensure that emergency personnel are always competent to respond to an emergency.</p>
5. Periodic testing of emergency procedures	Section Managers, First line Managers, Safety Manager, Environmental Manager, SHE practitioners and external service provider(s), where applicable	<p>Periodic testing of emergency procedures will be performed as per schedule(s), to ensure that the organization and/or external emergency services, where applicable can appropriately respond to emergency situations and prevent or mitigate associated health, safety and environmental consequences.</p> <p>Note: Emergency response procedures will be periodically tested "where practicable". This means that testing will be performed if it is capable of being done,</p>

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Activity	Responsibility	Method
		<p>if not dry runs will be done to verify preparedness and to evaluate response.</p> <p>Testing of emergency procedures will involve external emergency services providers, where appropriate, to develop an effective working relationship. This can improve communication and cooperation during an emergency.</p> <p>Emergency drills will be used to evaluate the organization's emergency procedures, equipment and training, as well as increase overall awareness of emergency response procedures. Internal parties (e.g. workers) and external parties (e.g. ambulance personnel) can be included in the drills to increase awareness and understanding of emergency response procedures.</p> <p>The organization will maintain records of emergency drills. The type of information that will be recorded includes a description of the situation and scope of the drill, a timeline of events and actions and observations of any significant achievements or deficiencies. This information will be reviewed with the drill planners and participants to share feedback and recommendations for improvement. Action(s) required to improve emergency preparedness and response will be managed as per system process regarding incident, nonconformity and corrective action – SP-NBC-SP012.</p>
6. Reviewing and revising emergency procedures	Section Managers, First line Managers, Safety Manager, Environmental Manager, SHE practitioners and external service provider(s), where applicable	<p>The organization will review its emergency preparedness and response procedures.</p> <p>The following aspects/factors can initiate a review:</p> <ul style="list-style-type: none"> <li>• Periodically reviewed as per schedule</li> <li>• Following organizational changes,</li> <li>• As a result of management of change</li> <li>• Following an event that activated the emergency response procedures,</li> <li>• Following drills or tests that identified deficiencies in the emergency response,</li> <li>• Following changes to legal and other requirements,</li> <li>• Following external changes impacting the emergency response</li> </ul> <p>Note: When changes are made in emergency preparedness and response procedure(s), these changes will be communicated to the personnel and</p>

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Activity	Responsibility	Method
		functions that are impacted by the change; their associated training needs will also be evaluated.
7. Maintain record	Delegated person(s)	Results of consultation with external emergency response agencies and results of emergency practices/drills will be maintained as per record control register, as defined per system process regarding control of record - SP-NBC-SHE 013.

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**Annexures**

Annexure A: How to deal with medical emergency

Annexure B: How to deal with surface fire under emergency conditions

Annexure C: How to deal with flooding under emergency conditions

Annexure D: Highwall Collapse

Annexure E: Labour and civil unrest

Annexure F: How to deal with a major hydrocarbon spillage in the workplace / area (include entrance to the mine)

Annexure G: How to deal with dirty water flowing into a clean area

**OUTPUT**

Well defined emergency response programme, include emergency response procedures, well maintained emergency equipment/resources and well trained employees capable of handling emergency situations.

**PROCESS PERFORMANCE**

**Evaluate Process Performance based on the following indicator(s) (KPI's):**

- Achievement of scheduled emergency practices v/s actual practices
- Collecting reactive information through accidents and incidents which occurred under emergency conditions, which are not currently managed under the current SHE management system as emergency situations

**Method/assessment:**

- Audit(s)
- Data source and analysis
- Management review(s)

**REFERENCE**

- ISO 45001:2018 (Clause 8.2)
- ISO 14001:2015 (Clause 8.2)

**RECORD**

- Review record of emergency response procedure(s)
- Communication with internal employees and external emergency services regarding emergency response arrangements
- Training needs analysis (skills matrix) and training records
- Emergency preparedness and response schedules
- Results of emergency practices or other form of testing
- Corrective action(s) initiated by emergency practices

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00	Initial document	27 January 2020	SHE Team

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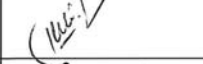

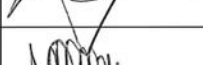
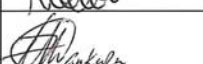




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SYSTEM PROCESS

INCIDENT, NONCONFORMITY AND CORRECTIVE ACTION

DOCUMENT NUMBER:	SP-NBC-SHE 012
CREATION DATE:	24 January 2020
LAST REVIEW / REVISED DATE:	24 January 2020
REVISION STATUS:	00
DOCUMENT OWNER: Job Title	Health and Safety Manager

APPROVAL			
NAME	DESIGNATION	SIGNATURE	DATE
R Ngomane	Document Owner		07/02/2020
T Thobedi	Resident Engineer		10/02/2020
K Mahlangu	Mine Manager (Acting)		07/02/2020
R Ngomane	Health and Safety Manager (Acting)		07/02/2020
N Cebekhulu	Environmental Manager		07/02/2020
L Mankuru	Manager, HR		07/02/2020
P Mamba	Manager, Plant		07/02/2020
J Mahlangu	SHE Committee Rep.		07/02/2020
M Musi	General Manager		10/02/2020

OBJECTIVE
This procedure outlines the process for reporting, assessing, investigating, implementing and evaluating action(s) taken to prevent re-occurrence. The reporting and investigation of accidents, incidents and non-conformities without undue delay can enable hazards to be eliminated and associated SHE risks to be minimized as soon as possible.

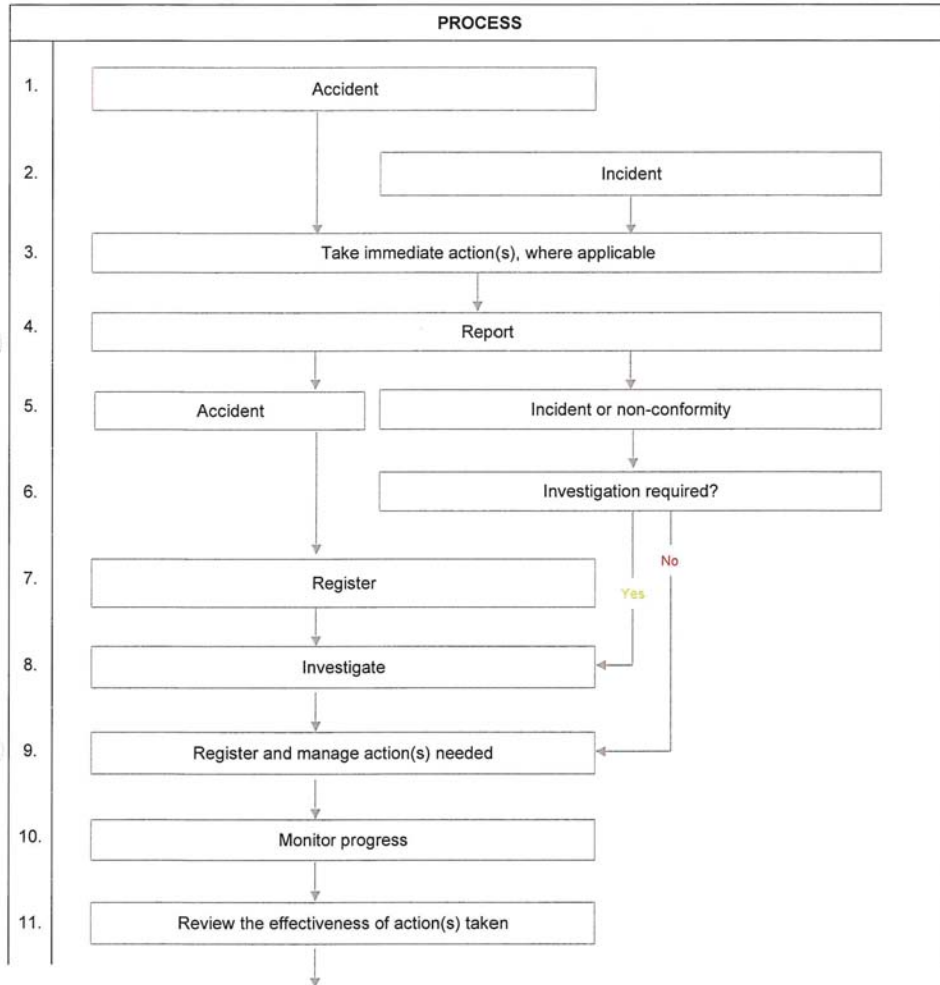
DEFINITIONS AND ABBREVIATIONS
<b>Accident</b> - An accident is an incident which has given rise to lost time injury, non-lost time injury, ill health or fatality.
<b>Incident</b> - An incident where no injury, ill health or fatality occurs may also be referred to as a "near-miss", "near hit", "close call" or "dangerous occurrence". Emergency situation is also a particular type of incident.
<b>Non-conformance</b> : No fulfilment of a requirement, deviating from relevant work standards, practices, procedures and legal requirements. Examples of non-conformances are all types of environmental spillage, depletion of natural resources, at risk behaviours, unsafe acts or unsafe conditions, normally findings identified through internal, external audits, inspections, site visits, property damage, production loss and etc.
<b>Potential non-conformance</b> : Initiate preventive action to prevent occurrence of an undesirable event.

RESPONSIBILITY
<b>Departmental Managers, Section Managers and Frist line managers</b>
<ul style="list-style-type: none"> <li>To ensure that all incidents and non-conformances are reported and recorded which occurred in his or her area of responsibility</li> <li>Responsible to ensure that investigations are performed and relevant workers and other relevant interested parties participate.</li> <li>Action(s) needed are implemented and maintained via management plans or action plans, and set as objectives were applicable.</li> <li>Responsible to ensure that the effectiveness of action(s) taken to prevent re-occurrence or occurrence are evaluated to prevent occurrence or re-occurrence of undesirable event.</li> </ul>
<b>Health and Safety Manager, Environmental Manager and SHE practitioners</b>
<ul style="list-style-type: none"> <li>Report on the status of corrective actions, include investigation(s).</li> <li>To verify if criticality assessment was done accurately, which will initiate an investigation or not</li> <li>Assist Departmental Managers, Section Managers and/or Frist line managers with investigations and corrective action(s)</li> </ul>

INPUT
<ul style="list-style-type: none"> <li>Accident (Injury or ill health)</li> <li>Incident (HPI or Near-miss)</li> <li>Nonconformity (Non-fulfilment of a requirement)</li> <li>Potential non-conformances (Initiated by Risk Assessment, Data Analysis (Leading Indicators), Suggestion / Recommendation and lesson learned from similar operations)</li> </ul>

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12.	Communicate results to relevant workers and, where they exist, worker's representatives, and other relevant interested parties.
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Activity	Responsibility	Method
3. Take immediate action(s), where applicable	Person(s) discovering the accident, incident or non-conformance, or Responsible First line manager	Where applicable, immediate action(s) will be taken when an unsafe act or conditions is observed, work will be stopped and unsafe conditions will be rectified immediately, isolated or controlled to ensure consequences or potential consequences are dealt with immediately.
4. Report	Person(s) discovering the accident, incident or non-conformance, or Responsible First line manager and/or Section Manager.	<ul style="list-style-type: none"> <li>Where applicable, an accident, incident or non-conformance will be reported to the responsible Supervisor, Safety Officer, Safety Representative, Environmental Practitioner, Environmental Manager and/or Health &amp; Safety Manager, with the completion of an Incident Notification Form.</li> <li>Non-conformances can also be reported through reports, interested party grievance, regulatory feedback and etc.</li> <li>Where applicable accident or incident will be reported to local authorities, government departments and etc. as required by law or agreements.</li> </ul>
6. Investigation required?	Responsible Departmental Manager, Section Manager, SHE Practitioner, Environmental Manager and/or Health & Safety Manager	Decision to investigate the accident, incident or non-conformance will be subjective to the discretion of Management and the Environmental Manager and/or Health & Safety Manager, the decision will be based on the potential severity or frequency of event occurring. Any incident or nonconformity with the potential to cause serious harm to the workers or the environment, based on the severity and frequency will be investigated to determine the root cause(s) and to ensure the prevention of re-occurrence of undesirable event(s).
7. Register	Responsible Safety Officer, Environmental Practitioner, Environmental Manager and/or Health & Safety Manager	Capture information into the relevant excel spread sheet/register and initiate applicable investigation form.

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Activity	Responsibility	Method
8. Investigate	As per Investigation Team (delegated persons)	Investigation will be done as per investigation methodology – ICAM/RCAT technique Results to be captured on the relevant investigation form, under the investigation part. Person(s) nominated to lead the investigation will have the appropriate competency and relevant workers and other relevant interested parties will be involved in the investigation, determining the cause(s) and determine if similar incidents have occurred, if nonconformities exist, or could potentially occur.
9. Register and manage action(s) needed	Responsible Departmental Manager, Section Manager, Environmental Manager, Health & Safety Manager, SHE Practitioner(s) and/or delegated person(s)	Action(s) needed to prevent re-occurrence will be in accordance with the hierarchy of controls and management of change procedure, and after the necessary approval has been obtained for the implementation of the action(s), the action(s) can be set as objectives and managed via management programme, action sheet or project plans.  Lessons learned will be summarized and communicated/distribute to relevant interested parties.
10. Monitor progress	Environmental Manager, Health & Safety Manager, SHE Practitioner(s) and/or delegated person(s)	Progress will be monitored by extracting/compiling progress reports from the relevant excel spread sheet/register. The results will be discussed at formal meetings, such as Management meetings, safety meetings and production meetings, where outstanding issues will be discussed.
11. Review the effectiveness of action(s) taken	Responsible Departmental Manager, Section Manager, Environmental Manager, Health & Safety Manager, SHE Practitioner(s) and/or delegated person(s)	Conduct follow-up, to verify whether the action(s) were completed and evaluate effectiveness.
12. Communicate results to relevant workers and , where they exist, workers representatives, and other relevant interested parties.	Responsible Departmental Manager, Section Manager and/or SHE Practitioner(s)	Communicate results to relevant workers, and where they exist, workers' representatives, and other relevant interested parties as per Communication, Participation and Consultation process - SHE - SP - 008.

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OUTPUT
Well defined process for managing accidents, incidents and non-conformances, to prevent occurrence or re-occurrence of unwanted event.

PROCESS PERFORMANCE	
<b>Evaluate Process Performance based on the following indicator(s) (KPI's):</b>	<b>Method/assessment:</b>
<ul style="list-style-type: none"> <li>Success rate to prevent re-occurrence of undesirable event(s)</li> <li>Ease of use regarding relevant reporting and assessment forms/spread sheet(s).</li> <li>Duration it takes to complete the cycle, from reporting to close-out of action(s)</li> </ul>	<ul style="list-style-type: none"> <li>Audit(s)</li> <li>Data source and analysis</li> <li>Management review(s)</li> </ul>

REFERENCE
<ul style="list-style-type: none"> <li>ISO 14001:2015 (Clause 10.2)</li> <li>ISO 45001:2018 (Clause 10.2)</li> </ul>

RECORD
<ul style="list-style-type: none"> <li>The nature of the accidents, incidents or nonconformities and any subsequent actions taken</li> <li>The results of any action and corrective action, including their effectiveness</li> </ul>

HISTORY OF CHANGES MADE TO THE DOCUMENT			
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00	Initial document	24 January 2020	SHE Team

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