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**Draft Environmental Management Programme
Report as part of the Basic Assessment for
the proposed electricity expansion project
and Sekgame switching station at the Sishen
Mine, Northern Cape Province.**



Technical Report: E-R-2015-01-30

Prepared for: Department of Environmental Affairs and I&APs

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Draft Environmental Management Programme Report as part of the Basic Assessment for the proposed electricity expansion project and Sekgame switching station at the Sishen Mine, Northern Cape Province.

January 2015

Conducted on behalf of:

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DOCUMENT HISTORY

| Report no | Date | Version | Status |
|----------------|--------------|---------|--------|
| E-R-2015-01-30 | January 2015 | 1.0 | Draft |



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1. INTRODUCTION

Kumba Iron Ore, Sishen Iron Ore Pty Ltd plans to develop additional electricity distribution infrastructure at their Sishen Iron Ore Mine in the Northern Cape Province. The proposed electricity distribution infrastructure will tie in with existing electricity distribution infrastructure at Sishen Mine and involve the following:

- 150 meter wide servitude from Ferrum Substation along the N14 road to the proposed new Sekgame Switching Station South of the Shooting Range Servitude
- Distribution lines (132kV overhead lines)
- Switching yard (Sekgame)
- The switching yard will be approximately 110 meters from the N17 Road, 250 meters long and 100 meters wide.

Eskom will be responsible for the construction, operation and maintenance of the infrastructure.

This Environmental Management Programme (EMPr) contains guidelines, operating procedures and rehabilitation/pollution control requirements which will ensure that the impacts of the proposed development are minimised and the positive benefits enhanced.

1.1. Purpose

This EMPr is to act as a flexible, standalone document and must be employed during all phases of the development. This document requires that responsibility, accountability and commitment be promoted at all times by the developer/owner, the main contractor and subcontractors.

Any non-compliance with the conditions set out in this EMPr will be regarded as an offence and will consequently be dealt with in terms of the relevant Sections in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Environmental incidences and the handling thereof, should be recorded by filling out the incidence logs, this responsibility should be taken up by the Environmental Control Officer or Environmental Liaison Officer.

The process which was followed in compiling the EMPr is in compliance with the NEMA, and applies the principles of Integrated Environmental Management (IEM).

1.2. Objectives

The main objective of Environmental Protection during construction and operation are:

- To ensure that the proposed operations do not impact on water quality or quantity available from local sources.
- To prevent where possible, or otherwise minimise soil, air, noise, surface- and groundwater pollution to acceptable levels.



- To minimise disturbance to and destruction of habitat of flora and faunal species.
- To minimise disturbances and destruction of heritage, archaeological and paleontological sites.
- To minimise and control the production of waste and the effects of waste on the environment; and to minimise the risk of accidental waste release and make provisions for emergency situations.
- To ensure compliance with relevant environmental legislation.
- To ensure effective environmental management is implemented at the proposed operations throughout the project lifespan.

1.3. Scope

The scope of work is according to the requirements as stipulated in the EIA Regulations, Government Notice No. R. 543 of 18 June 2010 (Environmental Impact Assessment Regulations). The EIA Regulations stipulate the requirements for the content of draft environmental management programmes. The scope of work in compiling this EMPr is cross referenced to the NEMA Requirements in Table 1 below:

Table 1: Regulatory requirements and Report Structure

| No | Requirement | Comment |
|-----|---|----------------------------|
| 33 | A Draft Environmental Management Programme must comply with section 24N of the Act and include - | |
| (a) | Details of – (i) The person who prepared the environmental management programme; and (ii) The expertise of that person to prepare an environmental management programme | Please refer to Appendix C |
| (b) | Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of – (i) Planning and design; (ii) Pre-construction and construction activities; (iii) Operation or undertaking of the activity; (iv) Rehabilitation of the environment; and (v) Closure | |
| (c) | A detailed description of the aspects of the activity that are covered by the draft environmental management programme; | Refer to Section 4 |
| (d) | An identification of the persons who will be responsible for the implementation of the measures contemplated in paragraph (b); | Refer to Section 4 |
| (e) | Proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon; | Refer to Section 5 |
| (f) | As far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including where | Refer to Section 4 |



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| | appropriate, concurrent or progressive rehabilitation measures. | |
| (g) | A description of the manner in which it intends to – (i) Modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Remedy the cause of pollution or degradation and migration of pollutants; (iii) Comply with any prescribed environmental management standards or practices; (iv) Comply with any applicable provisions of the Act regarding closure, where applicable; (v) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable. | Refer to Section 4 |
| (h) | Time periods within which the measures contemplated in the environmental management programme must be implemented; | Refer to Section 4 |
| (i) | The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity | Refer to Section 4 |
| (j) | An environmental awareness plan describing the manner in which – (i) The applicant intend to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; | Refer to Section 5.5 Table 2 |
| (k) | Where appropriate, closure plans, including closure objectives. | N/A |

2. PHASES OF THE PROJECT

The EMPr takes a pro-active route by addressing potential problems before they occur. This should limit corrective measures required during the construction and operational phases of the development. In particular, this EMPr deals with the following phases as detailed below:

2.1. Planning Phase

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development. Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

The planning phase includes the Basic Environmental Impact Assessment and authorisations period. The outcome of this phase will be to receive all the relevant authorisations prior to starting with construction. This phase will also include planning the detailed designs.

2.2. Construction Phase

The construction phase commences with site establishment and ends after the infrastructure has been constructed and the site rehabilitated. The majority of the impacts during this phase will have



immediate effect (e.g. noise-, dust- and water pollution). If the site is monitored as per the specialist recommendations during the construction phase, it is possible to avoid some of these impacts (i.e. by avoiding sensitive features on the site such as heritage resources or specific plant species) or to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase.

2.3. Operational Phase

During the operational life of the infrastructure, impacts could occur as a result of the presence of the infrastructure, or as a result of maintenance activities at the site. By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

3. ROLES AND RESPONSIBILITIES

A number of role-players will be responsible to ensure responsible environmental practices as described in this report are implemented on the proposed development site throughout the project lifespan.

Key individuals are briefly discussed in this section, and are identified in the table below where specific responsibility is assigned to each.

3.1. The Developer/ Project Proponent

The developer / project proponent will be the holder of the environmental authorization if one is issued in respect of the proposed project and thus assumes overall responsibility of the development and its repercussions on the environment. Duty of care in respect of environmental management as, inter alia, explained in the National Environmental Management Act, Section 28 and other relevant provisions as contained in this plus other applicable laws.

The applicant for this project is Sishen Iron Ore Company, acting on instruction from Eskom. Once environmental authorization has been obtained (if the competent authority decides to grant authorization), the intention of the applicant is to apply to have the Authorization transferred to Eskom, who will then be responsible for the implementation of the EMP and any other relevant conditions.

3.2. Project Manager (PM)

The Project Manager (an Eskom employee) is responsible for the overseeing of the construction and activities associated with the development.

3.3. Environmental Manager (EM)

The Environmental Manager (an Eskom employee) is responsible for the overseeing of the environmental management of all aspects of the construction and operational phase of the development. The EM will receive feedback from the ECO, and will approve any changes to the EMP, changes to the design etc. and will be responsible for overseeing any environmental incidents and the proper mitigation thereof.

**3.4. The Contractor or sub-contractors**

All contractors have the responsibility to implement and adhere to the EMPr and ensure that the factors which may compromise the achievements of the objectives of sustainable development and environmentally responsible operations are brought to the attention of the project proponent. The contractor must comply with all orders pertaining to environmental management issues (whether verbal or written) given by the ECO or directly by the project proponent. Contractors also have the responsibility to ensure that their employees are fully cognizant of, and abide by the EMPr. It is the service provider's responsibility to ensure that the works will comply with the specifications as set out in the management plan. Operators should be properly trained and informed of operational and maintenance responsibilities and environmental liabilities.

3.5. Environmental Control Officer (ECO)

The ECO is appointed by the developer and is responsible for undertaking regular monitoring of site activities. It is recommended that the ECO be appointed to conduct monthly site inspections for the duration of the construction phase of the project.

4. ENVIRONMENTAL MANAGEMENT ACTIVITIES CHECKLIST

The following table forms the core of this EMPr for the planning, construction and operational phases of this project. This table ought to be used as a checklist on site. During the construction phase, compliance with this EMPr must be audited monthly by the ECO.



Table 2: Management and Mitigation Measures – General Matters essential to the planning phase

| No | Activity/ Aspect | Impact | Significance (WOM) | Mitigation | Frequency / responsibility | Significance (WM) |
|----------------|---|---|--------------------|--|---|-------------------|
| General | | | | | | |
| 1 | The Environmental Management Programme (EMPr) | Understanding and implementation of the EMPr is essential to ensure compliance to relevant legislation and conditions of the authorization (if awarded) as well as to ensure environmental best practice, responsible environmental management and the prevention of pollution and environmental degradation. | Moderate | <ul style="list-style-type: none"> The Resident Engineer (RE) will keep a copy of the EMPr and the Environmental Authorisation (EA) at the site during the construction phase The EMPr must be updated with the conditions contained in the EA. It will be ensured that all parties employed at the project site are aware of the provisions of the EMPr and that these are legally binding. Employees must be taken through the EMPr and again if there are amendments or when new employees join. It is recommended that signage explaining the nature of the proposed development, timeframes involved, and contact details of a liaison official must be placed at key public areas around the site. The layout is captured on the Site Development Plan. Deviations from the Site Development Plan (if approved by the competent authority) should be approved by the Site Manager and the Project Manager (PM). Significant deviations have to be reported to DEA with motivational information and relevant approval sought. | Environmental Manager and Project Manager Prior to construction | Negligible |
| 2 | Contractors | The provisions of the EMPr should be included in contract documentation to ensure that provision is made for the implementation thereof and | Moderate | <ul style="list-style-type: none"> The contractor must sign that he has read and understands the EMP The contractor should provide a programme for site establishment to the construction manager and ECO prior to commencement. | Contractor(s) and environmental manager prior to construction | Negligible |



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| | | the meeting of the environmental management objectives | | <ul style="list-style-type: none"> The contractor must ensure compliance with conditions described in the Environment Authorisation. The contractor's camp should be located at the designated area as specified by the construction manager and ECO All contractors must be made aware of the audit and monitoring requirements in the EMP Any changes made to the EMP must be approved by the Environmental Manager / ECO As far as possible labourers should be drawn from the local areas. | | |
| 3 | Clear Site Demarcations | If the site is not properly demarcated the risk of impacts occurring beyond the approved footprints is increased | Moderate | <ul style="list-style-type: none"> Before construction begins, all areas to be developed must be clearly demarcated with danger tape or similar material. 'No-Go' areas should be clearly marked. No Machinery; personnel, material, or equipment should enter the 'No-Go' areas and No disturbance should be visible outside the demarcated area. Vegetation that is not to be removed must be clearly demarcated | Contractor(s) environmental manager and ECO Prior to construction | Negligible |
| 4 | Environmental Incidents | Regardless of precautionary measures implemented, accidents can still occur at the site and response to accidental pollution or degradation incidents should then limit the impact of the accident | Low | <ul style="list-style-type: none"> Records of all environmental incidents must be maintained and a copy of these records be made available to DEA on request throughout the project execution. Emergency response plans should be available on site including spill kits and employees should be trained how to respond to spillages of different types of materials. Confirm suitable sites for the construction camp (equipment and batching etc) and storage areas for materials, as well as site offices. No equipment | Contractor and ECO prior to construction and throughout construction phase | Negligible |



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| | | | | / materials will be stored in areas not specifically designated for that purpose and approved by the ECO. | | |
| 5 | Training | Personnel on site will not be allowed the "but I didn't know" excuse in the event of environmental degradation or pollution occurring as a result of their activities | Low | <ul style="list-style-type: none"> Environmental awareness training for construction staff, concerning the prevention of accidental spillage of hazardous chemicals and oil; pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts will occur prior to construction commencing. Ensure that the training and capabilities of the Contractor's site staff are adequate to carry out the designated tasks. Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks, as well as environmental sensitive areas on and around the site. | Contractor, PM, EM and ECO prior to construction with follow-up as necessary | Negligible |
| Impacts on Heritage Resources | | | | | | |
| 13 | Construction Activities (excavation, stockpiling etc.) | Displacement / destruction of heritage resources at SG461-SA01 | Low | <ul style="list-style-type: none"> Site Monitoring: Regular examination of excavations & trenches for subsurface stone age resources by qualified heritage specialist. Re-align the infrastructure to avoid the resource and a 20m conservation buffer around it. | ECO throughout construction phase Prior to commencement the project design team should re-align the infrastructure to avoid the archaeological sensitive areas | Negligible |



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| 14 | Construction Activities (excavation, stockpiling etc.) | Displacement / destruction of heritage resources at SG461-SA02 and SG461-SA03 | Moderate | <ul style="list-style-type: none"> • Conduct a Phase 2 Investigation: Document the sites by means of site mapping, surface artefact collection etc. subject to permitting from SAHRA and obtain a destruction permit for the sites. • Alternatively the infrastructure would have to be re-aligned to avoid the resources and a 20m buffer around the sites. | Phase 2 investigation to be done by qualified archaeologist – initiated by project proponent, prior to construction commencing | Negligible |
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Table 3: Management and Mitigation Measures – Construction and Operational Phases

| Topography and Visual Intrusion | | | | | | |
|--|---|------------------------------------|----------|---|---|-----|
| 1 | Presence of the Switching Yard and electricity distribution lines | Alteration of the Visual Landscape | Moderate | The infrastructure is relatively in keeping with existing developments in the surroundings and the visual landscape has already been significantly altered by similar infrastructure. | None | Low |
| Soils (Degradation, erosion, sedimentation) | | | | | | |
| 2 | Exposure of soils to rainfall and wind | Erosion | Moderate | <ul style="list-style-type: none"> • Cover disturbed soils as completely as possible. • Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. • Protect sloping areas and drainage channel banks; • Repair all erosion damage as soon as possible; • Gravel roads must be well drained; | Contractors throughout construction phase | Low |
| 3 | Exposure of soils to rainfall and wind | Dust contamination | Moderate | | | Low |
| Surface and Ground Water | | | | | | |
| 4 | Movement of vehicles and storage of materials on site | Pollution potential from Spillages | Moderate | <ul style="list-style-type: none"> • Any excess or waste material or chemicals should be removed from the site and discarded in an environmental friendly way. The ECO should enforce this rule rigorously; • Hazardous chemicals are to be stored on an impervious surface protected from rainfall and storm water • Ensure that refuelling stations on site (if any) are constructed so as to prevent spillage and ensure any accidental spillages can be contained and cleaned up promptly; • Spill kits should be on-hand to deal with spills immediately; • All vehicles should be inspected for oil and fuel leaks on a regular basis. Vehicle maintenance yards on site (if any) should make provision for drip trays that will be used to capture any spills. Drip trays should be emptied into a holding tank and returned to the supplier. | Contractors throughout construction phase | Low |



| Biodiversity | | | | | | |
|--------------|---|---------------------|----------|--|---|-----|
| 6 | Clearing of vegetation for construction | Habitat Destruction | Moderate | <ul style="list-style-type: none"> The entire development footprint should be clearly demarcated prior to initial site clearance and prevent construction personnel from leaving the demarcated area. Restrict clearing and damage of plant growth to demarcated areas. Where protected flora will need to be cleared permits should be obtained. The rehabilitation of the site after construction should be prioritized. Avoid sensitive habitats. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. All development activities should be restricted to specific areas approved by the ECO. Storage of materials should be limited to demarcated areas. Regular environmental training should be provided to construction workers. Where holes for poles pose a risk to animal safety, they should be adequately cordoned off and constant excavating and backfilling during planting of the poles should occur. The use of poisons for the control of rats, mice or other vermin should preferably be avoided and only be used after approval from an ecologist. Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions. Monitoring (ECO) should be implemented during the construction phase of the development to ensure that minimal impact is caused to the fauna and flora of the area. | <p>ECO to assist with demarcations and identification of site camp areas etc. prior to construction.</p> <p>Contractors throughout construction phase</p> | Low |



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| 7 | Clearing of vegetation for construction | Habitat Fragmentation | Moderate | <ul style="list-style-type: none"> • Use existing facilities (e.g., access roads) where possible to minimize the amount of new disturbance. • Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. • During construction, sensitive habitats must be avoided by construction vehicles and equipment. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • Construction activities must remain within defined construction areas and the powerline servitudes. No construction / disturbance will occur outside these areas. | Contractors throughout construction phase | Low |
| 8 | Movement of personnel and vehicles on and off site | Spread of Alien invasive species | Moderate | <ul style="list-style-type: none"> • Institute strict control over materials brought onto site. Inspect for potential invasive species and eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate insecticides prior to transport. Alien invasive tree species such as black wattle and blue gum should be eradicated. • Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Refer to the Working for Water Guidelines. • Rehabilitate disturbed areas as quickly as possible. • Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented. • Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive non-native plants should be avoided by keeping vehicles and equipment clean and reseeding disturbed areas with native plants. | Contractors throughout construction phase | Low |



| | | | | | | |
|----|---|--------------------------------|----------|---|--|------------|
| 9 | Presence of humans on site for construction | Negative effects on flora | Moderate | <ul style="list-style-type: none"> No staff should be accommodated on the site. The construction workers should stay in one of the nearby villages and transported daily to the site. Maintain proper firebreaks around entire development footprint. Construction activities must remain within defined construction areas and the servitudes. No construction / disturbance will occur outside these areas. Educate workers regarding the occurrence of important resources in the area and the importance of protection (for example the protected trees). Instruct employees, contractors, and site visitors to avoid disturbance of wildlife. No fires should be permitted on the construction site for cooking of food etc. | Contractors throughout construction phase | Low |
| 10 | Presence of the power lines and switching station | Avifauna (Bird) electrocutions | Moderate | <ul style="list-style-type: none"> Provide avian-safe facilities: An “avian-safe” power pole is a configuration designed to minimise bird electrocution risk by providing sufficient separation between energised phase conductors (also-called ‘phases’) and between phases and grounded hardware to accommodate at least the wrist-to-wrist or head-to-foot distance of a bird. Cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energised wires. Ensure adequate separation between conductors (1.4 to 1.8 meters). Insulation: cover energised parts and/or covering grounded parts with materials appropriate for providing incidental contact protection to birds. Apply perch managing techniques such as conspicuous objects and support roosting sites along the power line that would permit large raptors and bustards to safely roost. There has been considerable success achieved by providing artificial bird safe perches and nesting platforms, which are placed at a safe distance from the energised parts. | Accommodated in Project design prior to construction commencing and maintained throughout the lifespan of the infrastructure | Negligible |
| 11 | Presence of the | Avifauna (bird) | High | <ul style="list-style-type: none"> The line should be marked with suitable anti-collision marking devices | | Low |



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| | power lines and switching station | Collisions | | <p>on the earth wire as per the Eskom guidelines.</p> <ul style="list-style-type: none"> The design and technical aspects of using devices on the power line should consider: <ul style="list-style-type: none"> Line markers should be as large as possible, and increase the visible thickness of the line by at least 20 cm, for a length of at least 10-20cm; Spacing of devices should be not more than 5-10 m apart; Line markers should incorporate as much contrast with relevant backgrounds as possible; Colour is probably less important than contrast; Movement of the device is likely to be important; Markers that protrude vertically both above and under the cable are likely important; Devices that are nocturnally visible (through illumination, ultraviolet radiation and other means) would be advantageous. Although bearing in mind what is known about birds being attracted to illuminated objects. Line design: The nearer power line cables are to the ground, the better for preventing bird collision. Less vertical separation of cables is preferred as it poses less of an 'obstacle' for birds to collide with. Horizontal separation of conductors is therefore preferred. | Accommodated in Project design prior to construction commencing and maintained throughout the lifespan of the infrastructure | |
| Air Quality | | | | | | |
| 12 | Exposure of soils to rainfall and wind | Dust contamination | Moderate | <ul style="list-style-type: none"> A speed limit should be enforced on dirt roads (preferably 40km/h). Dust suppression via watering truck on construction areas may be required, according to prevailing site specific conditions. Protect stockpiles from erosion. | Contractors throughout construction phase | Low |



5. ENVIRONMENTAL MONITORING AND AUDITING

DEAT (2004) defines environmental auditing as “a process whereby an organisation’s environmental performance is tested against its environmental policies and objectives.” Monitoring and auditing is an essential environmental management tool which is used to assess, evaluate and manage environmental and sustainability issues:

In order to ensure that the objectives of sustainable development and integrated environmental management are met and in order to obtain data which can inform continuous improvement of environmental practices at the site (adaptive management), monitoring and reporting will be an essential component of the proposed operations.

Monitoring and management actions associated with the project are contained in this Section of this report as well as in the various specialist reports associated with this project. This section provides a summary of the critical monitoring aspects per specific environmental field.

5.1. General Monitoring and Management

The appointment of a suitably qualified on-site Environmental Manager / internal Environmental Officer is essential to the successful implementation of this project, although this role can be fulfilled by the SHE Representative. The Environmental Officer will be responsible for the implementation of the EMP, applicable environmental legislation and any stipulations/conditions set by the relevant competent authorities.

In addition to internal environmental management, an independent Environmental Control Officer (ECO) should also be appointed to conduct formal monthly site inspections for the duration of the construction phase. The Independent ECO should monitor the success and effective implementation of the environmental management measures stipulated by applicable legislation, the EIA, and EMP, and any conditions set by the competent authorities. Following each site visit, the ECO should submit a report to the DEA documenting the success/failure of the implementation of the management measures at the operations.

5.2. Specific Monitoring Requirements

Monitoring of the proposed development (both on site and where appropriate in the surrounding environments) should be considered a high priority and should be conducted in accordance with the relevant specialist recommendations as summarized below:

5.2.1. Ecological Monitoring

Peripheral impacts around the servitude area on the surrounding vegetation of the area should be avoided and a monitoring programme should be implemented to ensure the impacts are kept to a minimum, while the rehabilitation of the site should be prioritised after construction has been completed.



- Monitoring should be implemented during the construction phase of the development to ensure that minimal impact is caused to the fauna and flora of the area.
- Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds.
- A plan should be developed for control of noxious weeds and invasive plants that could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. Require the use of certified weed-free mulching. Prohibit the use of fill materials from areas with known invasive vegetation problems. The spread of invasive nonnative plants should be avoided by keeping vehicles and equipment clean and reseeding disturbed areas with native plants.
- Monitor the site for signs of erosion and take remedial action where there are problems.

5.2.2. Monitoring of Archaeological aspects

- Regular examination of excavations & trenches should be conducted by a qualified heritage specialist for subsurface stone age resources throughout the construction phase to ensure that no as yet undiscovered heritage resources are damaged.
- Additionally, a Phase 2 AIA should be conducted prior to construction commencing and a destruction permit obtained for the medium density MSA scatters (Site EXIGO-SG461-SA02, Site EXIGO-SG461-SA31). Alternatively, the infrastructure should be re-aligned so as not to impact on these resources including a conservation buffer of at least 20 meters.

5.2.3. Surface-and groundwater

Visual monitoring in the form of site inspections should be conducted to determine whether the following management measures are being implemented at site:

- Hazardous substances (hydrocarbons) are stored and handled in a bunded area with an impervious floor.
- Water falling on areas polluted with oil/diesel or other hazardous substances is contained.
- Construction vehicles are inspected for oil and fuel leaks.
- Used oil and other waste products are disposed of in an accepted way – preferably removed from the site and recycled.
- Vehicle maintenance yards are not situated in close proximity to water courses.
- Refuelling stations on site are constructed so as to prevent spillage of fuel or oil onto the soil.
- Measures to ensure that any accidental spillages can be contained and cleaned up promptly are



in place.

- Asphalt and concrete are mixed in areas which have been specifically demarcated for these purposes.
- All spilled asphalt and concrete is promptly removed to an approved disposal site.
- After mixing is complete; all waste is removed from the batching area and disposed of at an approved disposal site.
- No storm water is permitted to flow through the batching site.
- Batching areas are enclosed by a bunded wall.
- The construction camp is not situated in close proximity to water courses (if applicable).
- Chemical latrines are provided at the construction camp and along the rest of the site where construction activities may take place.
- Maintenance of storm water infrastructure is undertaken regularly. Damage to storm water infrastructure is undertaken after major flood events and material that restricts water flow is removed from culverts and drains.

5.3. Environmental incidents

An environmental incident is defined as any unplanned event that results in actual or potential damage to the environment, whether of a serious or non-serious nature. An incident may involve non-conformance with environmental legal requirements, the requirements of the EMP, or contravention of written or verbal orders given by the ECO or relevant authority.

In the event of any incident, an Environmental Incident Log should be completed and these reports should be kept on file by the Environmental Manager. Such reports should provide the following details:

- Date of the Incident (and time if relevant)
- Description of the nature of the incident (what happened)
- Explanation for current conditions (why it happened), responsible person, supporting photographs etc.
- Description of corrective actions taken

Corrective action to mitigate the impact (appropriate to the nature and scale of the incident) should be conducted immediately and affected parties notified.

In the case of serious incidents or emergencies, the incident report should be sent to the relevant authority as soon as possible after the incident has been recorded.

5.4. Penalties and Fines for Non-Compliance or Misconduct

This EMPr forms part of the contract agreement between the Client and the Principal contractor. As such,



non-compliance with conditions of the EMPr will amount to a breach of contract. Penalties will be issued directly to the PC by the ECO in the event of non-compliance to the EMPr specifications. The issuing of a penalty will be preceded by a verbal warning by the ECO, as well as strict instruction in at least one monthly ECO report to rectify the situation. The ECO and PC will communicate with regards to realistic time-frames for possible rectification of the contravention, and possible consequences of continued non-compliance to the EMPr.

Penalties incurred do not preclude prosecution under any other law. Cost of rehabilitation and/or repair of environmental resources that were harmed by the actions of the PC if such actions were in contravention of the specifications of the EMPr will be borne by the PC himself. Penalties may be issued over and above such costs. The repair or rehabilitation of any environmental damage caused by non-compliance with the EMPr cannot be claimed in the Contract Bill, nor can any extension of time be claimed for such works. Penalty amounts shall be deducted from Certificate payments made to the Contractor.

The following categories of non-compliance are an indication of the severity of the contravention, and the fine or penalty amounts may be adjusted depending on the seriousness of the infringement.

- Category One – Acts of non-compliance that are unsightly, a nuisance or disruptive to adjacent landowners, existing communities, or persons passing through the area.
- Category Two – Acts of non-compliance that cause minor environmental impact or localised disturbance.
- Category Three – Acts of non-compliance that affect significant environmental impact extending beyond point source.
- Category Four – Acts of non-compliance that result in major environmental impact affecting large areas, site character, protected species or conservation areas

5.5. Environmental awareness

Environmental awareness training is critical for two primary reasons:

- a) The workforce must understand how they can play a role in achieving the objectives specified in the EMP; and
- b) The workforce must understand their obligations in terms of the implementation of the EMP and adherence to environmental-legislative requirements.

This section of the report contains the environmental awareness plan which is aimed at ensuring that employees, contractors, subcontractors and other relevant parties are aware of and able to meet their environmental commitments.

All full time staff and contractors are required to attend an induction session when they start, which session should include environmental aspects. It is therefore recommended that the ECO/Environmental Manager be involved in induction training. The induction sessions may be modified / adapted based on the audience attending the specific session, but it should ensure that all employees gain a suitable



understanding of:

- Environmental requirements of the project, and how these will be implemented and monitored, including each employee's responsibilities with respect to environmental issues;
- Contents and commitments of the EMP, including no-go areas, employee conduct, pollution prevention (prohibitions against littering, unauthorized fires, loud music, entry to adjacent properties, road conduct etc.);
- Environmentally sensitive areas on and around the proposed development sites, including why these are deemed important and how these are to be managed. Employees will also be made aware of protected species found on the site and how these are to be conserved, as well as alien invasive species potentially found on the site and how these should be managed; and
- Incident identification, remediation and reporting requirements: what constitutes an environmental incident (spillages, fire etc.) and how to react if/when such an incident occurs.

Environmental training will not be restricted to induction training sessions alone, but will be conducted on an on-going basis throughout the lifecycle of the project as and when required. Records are to be kept of the type of training given (matters discussed and by whom), date on which training was given and the attendees of each training session.

6. CONCLUSIONS

The purpose of the Basic Assessment Report is to provide the relevant authority with sufficient information regarding the potential impacts of the development to make an informed decision. This Environmental Management Programme (EMPr) is to be applied during all phases of this development as an on-site reference document.

The project will result in limited negative environmental impacts, provided this development is mitigated, as per this EMPr. The responsibility lies with the Contractor to familiarise themselves with the contents of this EMPr. Furthermore auditing, by the ECO, will take place to ensure compliance with this EMPr. Parties transgressing this EMPr will be held accountable for any rehabilitation that may need to be undertaken.

Any non-compliance with the conditions set out in this EMPr will be regarded as an offence and will consequently be dealt with in terms of the relevant Sections in the National Environmental Management Act, 1998 (Act No. 107 of 1998).

7. REFERENCES

DEAT, 2004 Guideline Document on the EIA Regulations implementation of sections 21, 22 and 26 of the Environment Act. Pretoria.

DEAT, 2006. GNR 385 EIA regulations. Pretoria.

Plomp, H. (2004). A process for assessing and evaluating environmental management risk and significance in a gold mining company., (p. Annual National Conference of the International Association for Impact Assessment: South African Affiliate).



APPENDIX A ENVIRONMENTAL INCIDENT LOG



APPENDIX B COMPLAINTS RECORD SHEET



APPENDIX C DETAILS OF THE EAP