ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR SAND MINING QUARRY ON FARM PARESIS 507 NEAR OTJIWARONGO IN THE OTJOZONDJUPA REGION, NAMIBIA

DRAFT EMP AS PER SECTION 8 (J) OF THE EMA AND ITS 2012 EIA REGULATIONS

EDS PROJECT NUMBER:

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1 INTRODUCTION

1.1 Project Background

Otji bricks (hereinafter referred to as The Proponent) identified and proposes to establish a riverbed sand mining operation on Farm Parises 507. The target riverbed sand deposit within the Erundu River is suitable for quarrying sand for manufacturing bricks.

The proposed sand mining activity needs to be environmentally assessed to ensure compliance with the national environment, health and safety requirements and regulations and for development of mitigation and management plans for impacts identified that are associated with the proposed activities. Otji Bricks would like to gain control of the resource by first acquiring the necessary permits (i.e., environmental clearance certificate (ECC) so that they can start the operation. The locality map of the riverbed sand mining site is shown on the map in **Figure 1**.

This document has been prepared as a legal requirement by the Section 8 of the Environmental Management Act (EMA), No.7 of 2007 and its 2012 Environmental Impact Assessment (EIA). The compilation of this EMP was also one of the requirements by Otji bricks in the project's Terms of Reference (TOR). The TOR required that the appointed Environmental Consultant (Environmental Assessment Practitioner (EAP)):

- Prepare a detailed Environmental Management Plan that can be used as guide to monitor compliance to the recommendation made in the EIA and to assist in managing and monitoring activities during the operation and maintenance of the riverbed sand mining site.
- Furthermore, the Environmental Consultant must clearly clarify in the EMP the roles and responsibilities of the Otji bricks, the contractors and any other identified stakeholders.

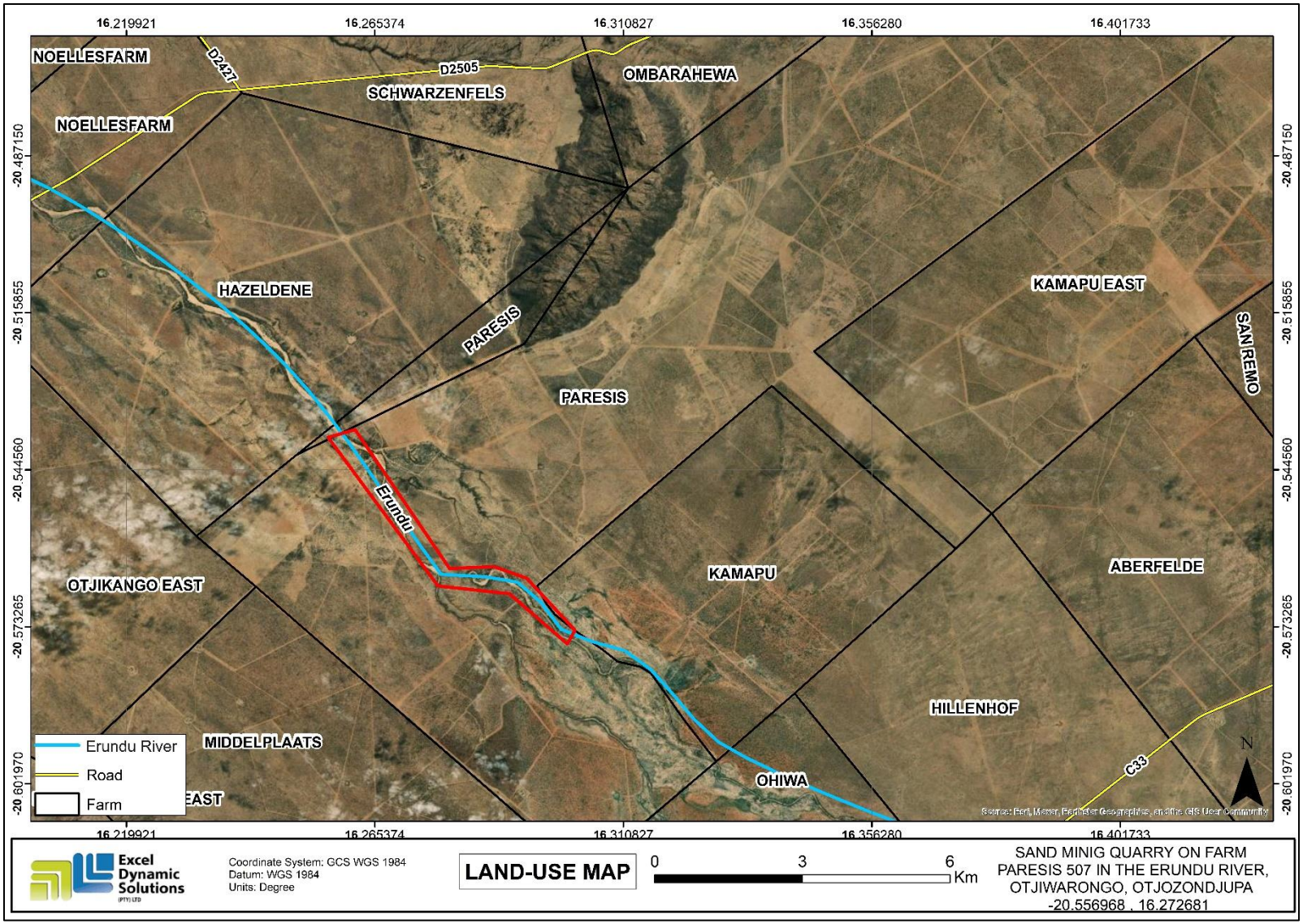

Figure 1: **Location of the borrow riverbed sand mining site, Farm Paresis No. 507.**

1.2 Aim of the Draft Environmental Management (EMP)

Regulation 8 of the Environmental Management Act (EMA) (7 of 2007) Environmental Assessment Regulations (2012) requires that a draft Environmental Management Plan (EMP) be included as part of the Scoping Environmental Assessment (EA) process. A 'management plan' is defined as:

> *"…a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored."*

An EMP is one of the most important outputs of the EA process as it synthesizes all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the EIA Process and the required environmental management on the ground during project implementation and operation. It is important to note that an EMP is a legally binding document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and should be amended to adapt to address project changes and/or environmental conditions and feedback from compliance monitoring.

The purpose of this document is therefore to guide environmental management throughout the different phases of the proposed development, namely planning and design, operation and decommissioning phases:

- **Planning and design** - the period, before operation and maintenance, during which preliminary legislative and administrative arrangements (such as land use agreement and recruitment processes) are carried out in preparation for the sand mining operation in the riverbed sand mining.
- **Operation and maintenance -** This is the phase during which the riverbed will be operational for sand mining and maintenance done by Otji bricks. In other words, it is during this phase that Otji Bricks will be mining sand from the riverbed.

Decommissioning – the riverbed sand mining areas necessarily require decommissioning when excavation of the riverbed reaches a certain depth. Therefore, when the excavation reaches decommission depth in future, Otji bricks will have to close it and look for a new site.

This draft EMP will be used by the Proponent and their employees and/or contractors in guiding them during the sand mining operations to ensure that impacts on the environment are avoided or limited if cannot be avoided completely.

1.3 Appointed Environmental Assessment Practitioner

Following the Otji bricks factory ECC renewal, EDS EAPs have discovered that the sand being used for production of the bricks is being acquired from a riverbed on farm Paresis and the was no ECC for this sand mining (illegal sand mining). Otji bricks has than requested EDS as an independent environmental consultant to carry out the necessary duties that are required to obtain an ECC from the ministry of environment forestry and tourism. Therefore, to ensure compliance with the environmental legal requirements, the Otji bricks has chosen to manufacture brick from other means while waiting for the riverbed on farm Paresis to be environmentally cleared for sand mining (obtain an ECC).

The entire EIA project is headed by Mr. Nerson Tjelos the consultation process and reporting are conducted by Mr. Stefanus L. Johannes, respectively. Mr. Nerson is a qualified and experienced geologist and a member of the International Association geoscience council of Namibia. He is also an experienced and a registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Professionals of Namibia (EAPAN). Mr. Stefanus L. Johannes, a qualified GIS specialist. The CV's for Mr. Tjelos and Mr. Stefanus are presented in Appendix A**.**

1.4 Details of the Project Proponent

The details of the Proponent are presented in **Table 1** below.

Table 1: Proponent contact details and purpose of the required ECC

Full name of Proponent	Physical Address & Contact number	Postal Address	ECC Application for:
Otji Bricks cc	Hatting, St,Industrial Area, Otjiwarongo, Namibia 081 1700 997 mailto:admin@otjibricks.com	Private Bag 72, Otjiwarongo, Namibia	SAND MINING QUARRY ON FARM PARESIS 507

1.5 Environmental Assessment Legal Requirements

The content of the EMP must meet the requirements Section 8 (j) of the EIA Regulations. The EMP must address the potential environmental impacts of the proposed activity on the environment throughout the

project life-cycle. It must also include a system for assessment of the effectiveness of monitoring and management arrangements after implementation.

The Otji bricks therefore has the responsibility to ensure that the proposed activities as well as the EIA process conform to the principles of EMA and must ensure that employees also comply with such principles. **Table 2** below lists the requirements of an EMP as stipulated by Section 8 (j) of the EIA Regulations, primarily on specific approvals and permits that may be required for the riverbed sand mining activities.

Table 2: Applicable legal requirements and permits to the riverbed sand mining.

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Environmental Management Act EMA (No 7 of 2007)	Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). Details principles which are to guide all EAs.	The EMA and its regulations should inform and guide this EA process. Should the ECC be issued to the Proponent, it should be renewed every 3 years, counting from the date of issue. Contact details at the Department of Environmental Affairs (DEA), Ministry of Environment and Tourism (MET) Contact person(s) at MET and their details **Mr. Damian Nchindo or Mr. Josafat Hiwana** (Chief and Senior Conservation Scientists and EIA Report Reviewers/evaluators) Tel: +264 61 284 2717 and +264 61 284 2962 Email: damian.nchindo@met.gov.na and josafat.hiwana@met.gov.na, respectively
Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)	Details requirements for public consultation within a given environmental assessment process (GN 30 S21). Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).	

1.6 Draft EMP Limitations

This EMP has been drafted with the acknowledgment of the following limitations:

- This EMP has been drafted based on the EIA conducted for the sand mining in the riverbed of farm Paresis No. 507.
- The mitigation measures recommended in this EMP document are based on the risks/impacts in the EIA Report which were identified based on the project description as provided by the Proponent, site investigation and public input. Should the scope of the proposed project change, the risks/impacts will have to be reassessed and mitigation measures provided accordingly.

The following chapter presents the project's roles and responsibilities to be assigned as deemed necessary by the Proponent pertaining to the implementation of this document.

2 EMP ROLES AND RESPONSIBILITIES

The Proponent is ultimately responsible for the implementation of the EMP. Alternatively, the Proponent may delegate this responsibility at any time, as they deem necessary during the project phases. The delegated responsibility for the effective implementation of this EMP will rest on the following key individuals which may be fulfilled by the same person:

- **Proponent's Representative (PR):** If the Proponent does not manage all aspects of the planning and design, operation and maintenance phase activities, decommissioning and rehabilitation, referred to in this EMP, they should assign this responsibility to a suitably qualified individual referred to in this plan as the Proponent's Representative (PR). The Proponent may decide to assign the role of a PR to one person for both phases or a PR may be appointed to manage the EMP aspects for each project phase. The PR's responsibilities include:
    - Managing the implementation of this EMP and updating and maintaining it when necessary.
    - Management and monitoring of individuals and/or equipment on-site in terms of compliance with this EMP.
    - Issuing fines for contravening EMP provisions.

Alternatively, the Proponent may delegate an Environmental Officer (ECO) from within the Otji bricks employees itself or they may appoint an external ECO to ensure EMP compliance throughout the project life cycle.

- **Environmental Control Officer (ECO):** The Proponent should assign the responsibility of overseeing the implementation of the whole EMP on the ground from the operation and maintenance to decommissioning phase and rehabilitation to a designated member of staff or external qualified and experienced person, referred to in this EMP as the Environmental Control Officer (ECO). The ECO will have the following responsibilities:
    - Management and facilitation of communication between the Proponent, PR and Interested and Affected Parties (I&APs) with regard to this EMP.
    - Conducting site inspections (recommended bi-annually for the operation and maintenance) of all areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP).
    - Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP.
    - Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP.
    - Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

2.1 Key Potential Environmental Impacts to be managed

From the assessment conducted, the following key potential negative impacts have been identified per project phase and are summarized in **Table 3** below.

Table 3: Summary of key potential environmental impacts per project phase

	Project Phase	Potential impacts identified
1	Planning and design	Planning and design failures
3.	Operation and maintenance	Groundwater pollution, Soils disturbance, health and safety, archaeological impact, visual, noise, dust (air pollution), decrease in property value, vehicular traffic safety, environmental pollution and loss of biodiversity
4.	Decommissioning	Excavation reaching permitted depth (clay soil level)

2.2 Aim of the Environmental Management Actions

The aim of the management actions of the EMP is to avoid potential negative impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

Management actions recommended for the potential impacts rated in the EIA carried out for the sand mining in the riverbed were based on the three project phases listed below:

- Planning and design (**Table 4**)
- Operation and maintenance phase(**Table 5**)
- Decommissioning (Closure) (**Table 6**).

The responsible persons at Otji bricks should assess these commitments in detail and should acknowledge their commitment to the specific management actions detailed in the phases given under the following subchapters.

2.3 Phase 1: Planning and Design Phase Management Action Plans

The management action plans recommended for this phase are presented in **Table 4** below.

Table 4: Management action plans for the Planning and Design Phase

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
EMP training	Lack of EMP awareness and the implications thereof	• All personal should be educated about the necessary health, safety and environmental considerations applicable to their respective works.	Proponent: ECO	Ongoing
Riverbed sand mining site designs	Consultation with residents/community/farmers	• Proper consultations should be done with the affected communities to ensure that the site is designs incorporate their concerns and opinions on how the fencing setup can be improved and cater to their needs.	Proponent: Public Relations Officer(s) in consultation or collaboration with the community	Planning
Employment	Labour recruitment	• Preference for both casual works during operational & maintenance work should be given to Otjiwarongo residents/locals. • No recruitment should be done on site. This should be carried out at the Otji bricks premises as per their recruitment.	Proponent: Human Resources Department.	Planning
	Sand mining workers (operational & maintenance)	• Appropriate personal protective equipment (PPE) for all employees involved in the operation and maintenance phase should be prepared. • The Labour Act and its regulations should be complied with at all times.	Proponent: ECO/Environmental, Health & Safety Officer / Occupational Health specialist Proponent: Human Resources Department	Planning and throughout the project phase
Vehicular Traffic	Traffic Safety	• Sufficient and visible sand mining notices should be erected close to the site access area. This will serve as a warning or an alert to vehicle drivers about upcoming sand mining works in the area.	Proponent: Planning Department	Planning and throughout the project phase

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		• The Proponent should raise community awareness about the traffic of the heavy vehicles (tipper trucks) that will be transporting the gravel loads.	Proponent: Public Relations Officer(s)	

2.4 Phase 2: Operational & Maintenance Phase Management Action Plans

The management action plans recommended for operations and site maintenance are presented in **Table 6** below.

Table 5: Management action plans for the Operation and Maintenance Phase

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
EMP training	Lack of EMP awareness and the implications thereof	• Employees appointed for sand mining works on respective areas of the site must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective works.	Proponent: ECO	Ongoing
Monitoring	EMP non-compliance	• The ECO or the Proponent should monitor the implementation of this EMP. • The ECO should inspect the site operation throughout the operational phase on a bi-annual basis **(every 6 months)**. • An EMP non-compliance penalty system should be implemented on site.	Proponent: ECO	Ongoing
Biodiversity	Loss of biodiversity	• Environmental awareness on the importance of biodiversity preservation should be provided to the workers	Proponent: ECO Workers involved this phase	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		• Workers should refrain from killing species (big or small) that may be found on the site. • Environmental awareness on the importance of biodiversity preservation should be provided to the contractors and workers. With regards to the vegetation on or within proximity of site, the following mitigation measures should be implemented: • Even if certain vegetation is found within the site, this does not mean that it should be removed. Therefore, care should be taken when preparing the site without destroying the vegetation.		
Soils	Land degradation and Pollution	• Spill control preventative measures should be put in place to manage soil contamination, no matter how small the amount of pollution (spill) is. • Polluted or contaminated soils by hydrocarbons or any hazardous substance should be removed, discarded at the nearest relevant waste landfill site and replaced with clean soil. • Site soils should not be disturbed, if not needed or related to the actual sand mining works. • Overburden material should be handled more efficiently during this phase to avoid erosion when subjected erosional processes.	Proponent: ECO	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		• Since the project site is in an area where due to little vegetation cover, soils are exposed, it is highly probable that more dust will be generated from excavating. It is therefore advised that in extremely windy days, a reasonable amount of water should be used to suppress the dust that may be emanating from certain site areas (limited to the site only).		
Air Quality	Dust generation	• The Proponent should ensure that the operational schedule is limited to the given number of days of the week, but not every day. This will keep the vehicle-related dust level minimal in the area, especially when it is windy. • Sand mining works schedule should be limited to weekdays only and between 08h00 and 17h00. This will keep the vehicle-related dust level minimal in the area. • In extremely windy days, a reasonable amount of water should be used to suppress the dust that may be emanating from certain site areas, where actual work is conducted.	Proponent: ECO	Ongoing
Water Resources	Pollution	• Potential contaminants such as hydrocarbons (diesel) should be contained on site and disposed of in accordance to the nearest municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater. • An emergency plan should be available for major / minor hydrocarbon spills during operational activities and during the transportation of the product(s) to the site.	Proponent: ECO Workers involved this phase	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Health and Safety	Health and safety of the workers	• As part of their induction, the workers should be provided with an awareness training of the risks of mishandling equipment and materials on site. • When working on site, employees should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, safety glasses, etc depending on the type of work being done. • Employees should not be allowed on site if under the influence of alcohol. • The Proponent should ensure that site is equipped with "danger" or "cautionary" signs for any potential danger or risk area identified on site. This will not only safeguard the site workers, but the community accessing the site to acquire gravel during the operation phase. • No employee should be allowed to drink alcohol prior to and during working hours as this may lead to mishandling of equipment which results into injuries and other health and safety risks.	Proponent: ECO / Environmental, Health & Safety Officer / Occupational Health specialist Workers involved in this phase	Ongoing
Vehicular Traffic	Traffic Safety	• Drivers of the operational vehicles should be in possession of valid and appropriate driving licenses. • Vehicle drivers should adhere to the road safety rules. • Project vehicles and machinery should be serviced regularly in order to avoid accidents as a result of mechanical faults of vehicles and machines.	Proponent: ECO Proponent: Planning Department	Ongoing
Noise	nuisance	• Operational works should be limited carried out on between 08h 00 and 17h 00.	Proponent: ECO	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		• The sand mining operational times should be set such that, no work is carried out during the night or very early in the mornings. • Sand mining operational hours should be restricted to between 08h00 and 17h00 to avoid noise generated by equipment and the movement of vehicles before or after hours. • When operating machinery that produce excessive noise, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.		
Waste generation	Environmental Pollution	• Workers should be sensitised to dispose of waste in a responsible manner and not to litter. • A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented. • The site should be equipped with separate waste bins for hazardous and general waste/domestic. • After each daily works, there should be no waste left scattered on site, bur waste should be collected and dumped in respective site waste bins. • All domestic and general operational waste produced on a daily basis should be contained until such that time it will be transported to designated waste sites. • No waste may be buried or burned on site or anywhere else.	Proponent ECO	Ongoing
Visual	Visual nuisance	• All the necessary options to improve the aesthetic of the site should be considered so that it blends in with the surrounding area or at least enhance it for a better appeal to the community	Proponent o	As required (when maintaining the site)

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Archaeological	Impact on unknown cultural or heritage sites/objects	• The Proponent should consider having a qualified and experienced archaeologist on standby during the as required during the operational phase. This action will be to assist on the possible of uncovering of sub-surface graves or other cultural/heritage objects and advice the Proponent accordingly. • Identified graves or any archaeological significant objects on the site should not be disturbed, but are to be reported to the project Environmental officer or National Heritage Council offices	ECO	As required

2.5 Phase 3: Decommissioning Phase

The management action plans recommended for closure are presented in **Table 7** below.

Table 6: Management action plans for the Closure (Decommissioning) Phase

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
site closure	loss of gravel mining site for the community	• The Proponent should, consider making arrangements well in time for a new site In the river before the current operational site reaches the decommissioning depth.	Proponent: ECO in consultation and/or collaboration with the Planning Departments	Pre-decommissioning

3 ENVIRONMENTAL MONITORING

In order to reduce the "medium" and maintain the "low" significance ratings of impacts identified and assessed in the EIA report, the following monitoring activities are recommended:

- **Environmental:** bi-annual EMP implementation and compliance monitoring should be undertaken throughout the project cycle. The first bi-annual monitoring exercise should be done counting 6 months from the date of ECC issuance. Environmental monitoring reports are to be compiled and submitted to the Department of Environmental Affairs (DEA) for archiving. This practice will make the ECC renewal easy when it is about to expire. Therefore, Otji bricks should effectively monitor and submit the reports to the DEA. The submission is not only done for record keeping purposes, but also in compliance with the environmental legislation.
- **Environmental (Checklist):** In order to make impact monitoring and EMP compliance easy, the Proponent should consider creating an Impact-Indicator Checklist that can be used by the ECO and updated every 6 months**.**

4 CONCLUSIONS

The potential positive and negative impacts stemming from the site and associated activities were identified, assessed (for the negative impacts) and mitigation measures made thereof. The mitigation measures and recommendations provided in this EIA report and management action plans provided in the draft EMP, can be deemed sufficient to avoid and/or reduce (where impact avoidance is impossible) the risks (negative impacts) to acceptable levels. EDS is therefore confident that these measures are sufficient and thus recommends that the Proponent be issued with the Environmental Clearance Certificate (ECC) to enable the operation of the riverbed sand mining. However, the ECC should be issued on condition that the provided management measures and action plans are effectively implemented on site and monitored. Furthermore, should the ECC be issued, the