

ENVIRONMENTAL AUDIT REPORT

Small-scale Mining of Marble /
Dimension Stones on Mining Claims
No. 69320 and 69321 in the Karibib
District, Erongo Region



Mr. Michael I. T. Petrus

Inyenga Marble Mining cc

P. O. Box 2773

Windhoek, 9000

DOCUMENT INFORMATION

Title	Renewal of Environmental Clearance Certificate for Mining of Marble / Dimension Stone on Mining Claims 69320 and 69321 situated in the Karibib District, Erongo Region
Project Manager	Vilho P. Mtuleni
Author	Vilho P. Mtuleni
Reviewer	Enviro-Leap Consulting cc
Client	Mr. Michael I. T. Petrus
Date last printed	06/11/2020
Date last saved	10/11/2020
Project Number	ELC-MITP/2020-013
Report Number	MITP/2020-017
Status	First Draft
Issue Date	October 2020

NON-TECHNICAL SUMMARY

OVERALL OVERVIEW

Mr. Michael Inyenga Tonateni Petrus, the proponent is the sole owner of Inyenga Marble Mine (IPMM) a fully registered, 100% Namibian owned company that ventures in small-scale exploration and quarrying of semi-precious and dimension stone.

The proponent aim is to take advantage of the opportunity for self-employment and job creation that exist in the small-scale quarrying industry. Mr. Inyenga operates his business activities on Mining Claims No. 69320 and 69321, on a quarry situated about 45 km South-west of Karibib central on Farms Etusis No. 75 and Gamikaub West 115 respectively (see Fig.), in the vicinity of Karibib Town in Erongo Region.

The core activities of Mr. Inyenga's operation, apart from minimum value addition by way of cutting the marble into block and processing into household products such wash basins and table-tops, also includes: - Exploration of Semi-precious Stones - Quarrying of Marble (Dimension Stone).



Fig 1: Shows general setup of a marble quarry where block are extracted and stored before being hauled to the harbour town for shipping (this is the least radioactive quarry activity).

The Mining Claims are within the southern Central Zone of the Damara Orogenic, a common geological formation of various topography in Namibia. From Windhoek (capital City), the site can be accessed through the B2 road connecting Okahandja and Swakopmund. Being cognizant of the compliance requirements in respect to the Environmental Management Act No. 7 of 2007 and its regulations of 2012, Mr. Inyenga obtained an Environmental Clearance Certificate (ECC) in 2017. The ECC is due to expire and thus the proponent appointed Enviro-Leap Consulting to facilitate the process of renewing the ECC.

The potential environmental and socio-economic impacts associated with the Mr. Michael I. T. Petrus small-scale mining activities were identified during the initial environmental assessment process and documented in the approved environmental management plan. These together with the conditions of the environmental clearance certificate (ECC) are to be audited on expiry date and prior to its renewal.

TABLE OF CONTENT

NON-TECHNICAL SUMMARY.....	iii
OVERALL OVERVIEW	iii
TABLE OF CONTENT.....	iv
1 PROJECT BACKGROUND	1
1.1. PROJECT LOCATION.....	1
1.2. PROJECT ACTIVITIES.....	1
2 ENVIRONMENTAL OBLIGATIONS	3
3 AUDIT METHODOLOGY	7
3.1 Desktop study	7
3.2 Site visit and Inspection.....	7
3.3 Reporting and submission to the DEA.....	8
6 ENVIRONMENTAL AUDIT FINDINGS.....	9
6.1 INTRODUCTION TO THE SCORING CRITERIA.....	9
6.2 SYNTHESIS OF AUDIT FINDINGS	9
8 ENVIRONMENTAL STATEMENT & RECOMMENDATIONS	15
REFERENCES	16
APPENDICES.....	17
APPENDIX A – PREVIOUS ENVIRONMENTAL CLEARANCE CERTIFICATE	17

1 PROJECT BACKGROUND

1.1. PROJECT LOCATION

Mr. Inyenga operates his business activities on Mining Claims No. 69320 and 69321, on a quarry situated about 45 km South-west of Karibib central on Farms Etusis No. 75 and Gamikaub West 115 respectively (see Fig. 3 – Locality Map and Table 1 – exact coordinates), in the vicinity of Karibib Town in Erongo Region.



Fig. 3: Locality map of the proposed exploration activity’s site or area in the Otjozondjupa Region, Namibia.

The exact site is located within distant proximity of two prominent marble quarrying operations namely the Omusati Mine and Purity operations to the North-eastern side and the Navachab Gold Mine to its North-western side.

Table 1: GPS coordinates of the IPMM and Partners Mining Claims

GPS POINTS	LATITUDE	LONGITUDE
Mr. Michael I. T. Petrus (Mining Claim’s No. 69320 and 69321)	-22.241434°	15.644878°
	-22.239255°	15.642118°
	-22.241553°	15.638145°
	-22.242916°	15.638934°

1.2. PROJECT ACTIVITIES

The process is essentially continuous with extraction and haulage steps running in series, as discontinuous process of drilling and blasting is required prior to the loading and hauling stages. It uses a variety of different types of equipment including shovels, trucks, draglines, bucket wheel excavators and scrapers.

Drilling:

After the working trench and the face for frontal excavation have been done, horizontal and vertical holes are drilled. Vertical drill holes are drilled at a distance of 15 to 35cm depending on the characteristics of the block and the manner of initiation. The distance between vertical drill holes is a = 30 cm. This distance is not applied to rear drill holes that are of lesser number than the frontal. The distance between them should amount to 1/2 of the distance of the frontal drill holes.

The number of horizontal drill holes is the same as that of the vertical frontal ones. However, horizontal drill holes are drilled in the footwall at a zero angle of drilling (horizontal). The first horizontal drill hole should be spaced in the middle between the first and second vertical frontal drill hole. This pattern is done in order to eliminate possible overlapping of strikes of vertical and horizontal holes that may result in concentration of blasting material (explosive, detonating fuse and black powder) and excessive damage of the block. The drill holes pattern, the manner of connection and initiation are shown in fig. 1.

Extracting block through wire saw:

Dimension stones are often hard, hence it needs extracting through wire saw, chain saw or diamond wire saw. In this process, chain saw or wire saw leaves cut between the blocks. This machine can perform both vertical and horizontal cuts. Both dry and wet cutting also can be done, however due to the need to reduce the operational water demands, and conservation of water thereof IPMM adopted the dry cutting. IPMM is cognisant of the potential dust pollution associated with dry cutting and thus wind speed and direction are regularly monitored.

Transporting Blocks:

After quarrying the blocks, the backhoe loader and excavator lifting equipment are used for transporting the blocks. Plans are that mobile and stable cranes are acquired and used for lifting and loading the blocks as the business expands.

1.3. OPERATIONAL INFRASTRUCTURE

Onsite infrastructure at the site consist of a 19 ha Mining Claim area of which 1 ha (Although the actual Chalcedony Quartz pit's footprint is only 0.39 ha) is fenced off, necessary to exclude entry of both livestock, wildlife and unauthorised personnel to the site and thus ensuring good safety and security to all as (see in Fig 9).

Due to its small-scale nature of quarrying and with only man employed at the project, the current housing infrastructure consist of tented accommodation (which will be converted to corrugated iron sheet structures), boosting two Pit latrine toilets and bathing facility.



Fig 5: Mine site with the key infrastructure depicted in the background i.e. site fence and entry gate, water supply truck

Water for both domestic and operational use is sourced from the main farm boreholes and supplied by truck on a weekly basis (1000 litres) and currently stored in an equivalent sized tank, however plans are to expand storage capacity to 5000 litres month supply. Energy is supplied by 5 Watt diesel powered generator, used mainly for food preservation and lighting at the lodging facility, while for cooking the energy needs are met use of gas. The diesel supply for the earthmoving equipment is stored in raised 4500 litres capacity tanks (Fig 10) and is also brought in by truck to the project site on pre-existing farm tracks.



Fig 6: Shows the Staff accommodation and Current Office Facility (including ablutions), in foreground is the fleet collection (light vehicle and compressor equipment)

1.4. DECOMMISSIONING AND CLOSURE PHASE

The operational lifespan of the marble quarrying activities are at this stage not determined but could possibly extend to ten (10) years, however it influence by numerous factors such investment opportunity, demand for the exact product type, surface use agreement and market factors.

2 ENVIRONMENTAL OBLIGATIONS

TABLE 1: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – FIELD MAPPING, GEOPHYSICAL SURVEYS AND SOIL SAMPLING				
ACTIVITY	POTENTIAL IMPACT	MANAGEMENT AND MITIGATION MEASURES	ACTION PLAN	
			Frequency	Responsible Parties
Ground survey, mapping, soil sampling and trenching / pitting	Socio-economic	Sign and honour agreements (Surface Use-Agreements) set out in the site-access contracts Compile and maintain a stakeholder engagement plan, through which regular feedback regarding activities on the individual properties is conducted	Throughout all operations	Project Manager / Site supervisor
	Biodiversity	<ul style="list-style-type: none"> • Awareness raising and training on the value of biodiversity and need to conserve the species and systems within the project area must be conducted • No new access tracks shall be created where alternatives exists, and speed limits signage and awareness must be enforced to prevent road kills. • Land owners / farmers must be consulted to help ID sites and species of conservation importance 	Throughout all operations activities	Project Manager / Site supervisor
Ground survey, mapping, soil sampling and trenching / pitting	Air quality	<ul style="list-style-type: none"> • Vehicle speeds limit of 40km/h on access routes must be enforced to limit dust, and where practical dust suppressants must be applied. 	During Operation	Project Manager / Site supervisor
	Heritage	<ul style="list-style-type: none"> • Consult with landowner and relevant competent authority to identify known archaeological sites on the farm (cross the Mining Claims area) • Adopt the search-and-find procedure in any event that archaeological resources are discovered, by reporting to the competent authority any find incidence • Compile and maintain a chance find emergency procedure plan which includes the following: <ul style="list-style-type: none"> ○ All work at the find site must be stopped to prevent any damage; ○ An appropriate heritage specialist must be appointed to assess the find and related impacts; and ○ Permitting applications made to the necessary authorities, if required. • In the event that any graves are discovered during the during the exploration activities, these will be avoided and preserved as a first priority. If damage is unavoidable, prior to damaging or destroying any identified graves, permission for the exhumation and relocation of graves must be obtained from the relevant descendants (if known) and the relevant local and provincial authorities. 	Throughout all operations activities	Project Manager / Site supervisor

TABLE 2: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – BASE-CAMP AND DRILL SITE ESTABLISHMENT

ACTIVITY	POTENTIAL IMPACT	MANAGEMENT AND MITIGATION MEASURES	ACTION PLAN	
			Frequency	Responsible Parties
Setting-up and Operational Activities at Base camp and Drill sites	Air quality – dust and gaseous emissions	<ul style="list-style-type: none"> The movement of drilling related vehicles on the unpaved access track will be on a small scale Vehicle speeds limit of 30km/h on access routes must be enforced to limit dust, and where practical dust suppressants must be applied. Vehicles and the drilling rig will be maintained in good working order 	During setting-up and Operation	Project Manager Site supervisor
	Noise	<ul style="list-style-type: none"> Drill site are to be cited more than 200 metres away from any residential infrastructure Drill operations are to be limited to daylight working hours (07 am – 17 pm) so as to avoid noise generation during resting hours Vehicle speeds limit of 30km/h on access routes must be enforced to limit dust, and where practical dust suppressants must be applied. 	During setting-up and Operation	Project Manager Site supervisor
	Biodiversity	<ul style="list-style-type: none"> Refer to biodiversity management measures relating to ground surveying, mapping and sampling (Table 1). A floral survey of all drill sites need to be conducted prior to establishment to ensure that no protected (under the Ministry of Environment and CITES) species are destroyed. Provide appropriate portable toilet facilities for the exploration workers at the drill sites 	During setting-up or Establishment	Project Manager Site supervisor
	Land use	<ul style="list-style-type: none"> The drilling activities footprint must be minimized as far as is practically possible i.e. drill sites must be demarcated and fenced off with tape to ensure that all scheduled activities are contained and all tapes removed upon completion. Agree on relevant compensation with land-owners where impacts on existing land-uses cannot be avoided 	During setting-up or Establishment	Project Manager Site supervisor
	Soil Erosion	<p>To minimize erosion access tracks should be created as follow:</p> <ul style="list-style-type: none"> Follow contour lines as much as practically possible Erect berms to minimize soil erosion during rain events Don't create furrows, channels etc. which could lead to soil erosion 	During setting-up or Establishment	Project Manager Site supervisor
	Heritage	<ul style="list-style-type: none"> Refer to heritage management measures relating to ground surveying, mapping and sampling (Table 1) 	During Drilling	Project Manager Site supervisor
	Socio-economic	<ul style="list-style-type: none"> Refer to socio-economic management measures relating to ground surveying, mapping and sampling (Table 1) Discuss water use with landowner in case of diamond drilling 	During setting-up and Operation	Project Manager Site supervisor

TABLE 3: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – DRILLING ACTIVITIES

ACTIVITY	POTENTIAL IMPACT	MANAGEMENT AND MITIGATION MEASURES	ACTION PLAN	
			Frequency	Responsible Parties
- Drill borehole - Contain all drilling water in the sump and allow to settle - Log the drill core and place on core trays - Maintain ablation	Contamination of Soil / hydrocarbon spillages	<ul style="list-style-type: none"> Hazardous substances, spillages containment such as impermeable floors and bunded trays must be employed to contain a 110% of the volume of the hazardous substances stored and handled on site All refuelling and any maintenance of vehicles will take place on impermeable surfaces. Spill kits will be readily available and provided to employees and/or contractors, Mr. Michael I. T. Petrus will provide training and environmental awareness to its employee and contractors on the use of spill kits in order to enable containment and remediation of pollution incidents. A PVC lined sump will be used for collection of oils and silt contained in the drilling water No drilling activities to take place in close proximity (within 500 m) of any farm dam, and 200 m from residential infrastructure. 	Overall operations	Project Manager Site supervisor
	Groundwater contamination	<ul style="list-style-type: none"> Refer to management measures relating to contamination of soils. Licenses in terms of the Water Resource Management Act (Act No. 11 of 2013) will be obtained for all drilled holes (not just boreholes). Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm. 	Overall operations	Project Manager Site supervisor
	Land use	<ul style="list-style-type: none"> Refer to land use management measures relating to drill site establishment (Table 2) 		Project Manager Site supervisor
Water abstraction	Groundwater quantity	<ul style="list-style-type: none"> An agreement to abstract water from existing boreholes must be included in the land access agreement. Water use licenses in terms of the Water Resource Management Act (Act No.11 of 2013) will be obtained for all boreholes. Water levels will be measured prior to abstraction, during abstraction (daily) and after completion. Levels will be reported to land owners. Should water be reached during drilling the landowners will be informed. Should the landowners wish it; the holes will be cased and left for use by the farmers (liability relating to the boreholes will then be transferred to the landowners). 	Overall operations (setting-up, drilling and domestic consumption)	Project Manager Site supervisor

TABLE 4: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – RELEVANT TO ALL EXPLORATION AND CLOSURE / REHABILITATION ACTIVITIES

ACTIVITY	POTENTIAL IMPACT	MANAGEMENT AND MITIGATION MEASURES	ACTION PLAN	
			Frequency	Responsible Parties
All exploration activities	Social – provision of toilet facilities during Operational Phase	<ul style="list-style-type: none"> Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm. 	Overall operations	Project Manager Site supervisor
	Solid and Effluent Waste Management during Operational Phase	<ul style="list-style-type: none"> Waste generated will be handled in accordance with the contract signed with the landowner. Suitable receptacles for waste disposal will be provided at appropriate locations on site. These receptacles will be clearly marked for different waste types. 	Overall operations	Project Manager Site supervisor
	Hazardous Waste Management during Operational and Closure & Rehabilitation	<ul style="list-style-type: none"> Employees and contractors will be sensitized on correct waste disposal and sustainable practices e.g. recycling. Waste will be removed from site and disposed-off at a suitable licensed waste disposal facility. Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at a licenced hazardous waste disposal facility (Kupferberg). 	Overall operations	Project Manager Site supervisor
	Waste management during Closure and Rehabilitation	<ul style="list-style-type: none"> Decommission ablution facilities Ensure that all waste generated during activities is removed from the site and disposed of appropriately 	Overall operations	Project Manager Site supervisor
	Land-use During / Post Closure and Rehabilitation	<ul style="list-style-type: none"> Land owners will be invited to carry out site inspections following rehabilitation in order to ensure that it has been carried out suitably. 	Overall operations	Project Manager Site supervisor

3 AUDIT METHODOLOGY

To ensure that development activities are undertaken in an economic, social and environmental sound / sustainable manner, the Namibian Constitution and Environmental Management Act No. 7 of 2007 provides for an environmental assessment process. The purpose of the environmental assessment is therefore to ensure compliance of a development operations with the environmental legislation in respect to managing potential impacts associated with the exploration activities.

In this instance the, an environmental Audit has to be undertaken to assess whether the Mr. Michael I. T. Petrus operation were undertaken in compliance with the ECC Conditions: The specific objectives of this report is therefore to:

- Review the initial environmental assessment documents (including ECC Conditions) in order to identify the potential impacts that requiring mitigation and compliance.
- Conduct ground verification to ascertain compliance in respect to implementation of the approved EMP measures and ECC conditions by Mr. Michael I. T. Petrus Mining Company
- Compile an Environmental Audit report for submission to effect the renewal of the Environmental Clearance Certificate for continuation of the small-scale mining activities on the two Mining Claims 69320 & 69321.

The audit was conducted adopting a three phase approach consisting of 1.) A desktop study, which entails a detailed review of the EIA and EMP documents previously submitted to the Department of Environmental Affairs (DEA), 2.) A Site visit / inspection, to conduct ground verification of the operations or activities undertaken during the current review period, and 3.) Reporting and submission of both the Audit Report and a Revised EMP to DEA for an ECC renewal consideration. These three phases are concisely presented below.

3.1 Desktop study

The copy of an environmental screening (Pro-forma) questionnaire previously submitted to obtain the Environmental \Clearance Certificate and the Environmental Contract signed between the Ministries of Environmental and Tourism (then) and Mines and Energy, and the proponent for the marble mining activities on mining claims 69320 and 69321 in the Erongo Region were obtained and reviewed in order to identify the potential impacts that require mitigation on the ground. An environmental checklist was then developed, to guide the audit conducted in September 2020.

3.2 Site visit and Inspection

Enviro-Leap Consulting cc conducted, in collaboration with staff at Inyenga Marble Mine a site visit and inspection in **September 2020**. This consisted of a site walkover to inspect the different sections of the operations including drilling sites, basecamp, and equipment maintenance workshop and onsite ablution facilities.

3.3 Reporting and submission to the DEA

The audit concludes that although the Mr. Michael I. T. Petrus small-scale mining activities has been operated at a very small-miner scale for the most of the ECC's clearance validity and review period, the ECC's condition requires that continuous monitoring and reporting is done.

This environmental audit report therefore compiles several reports and provides recommendations to DEAF for the ECC renewal consideration through rigorous:

- A comparison of what was recommended in the EMP to what is currently being done / implemented on site, and a
- Synopsis of results obtained during the monitoring of Mr. Michael I. T. Petrus's small-scale mining activities impacts on water resources and the socio-economical aspect of the receiving environments.

Overall, to reach the conclusion on compliance, all environmental obligations (**Tables 1 – 4**) were findings were assessed and ranked according to the colour coded scoring criteria (with a value assigned) portrayed in **Table 5**. The colour coding assigned to the rankings is used to visualize of compliance performance in terms of a four (4) scoring categories of non- / compliance i.e. compliant, non-compliant (*minor, moderate, and major*), repeated condition and not applicable. The latter scores are necessary in separating or to indicate which conditions are not applicable to the on-site activities and which are repeat conditions that have already been scored.

Table 5: Scoring Categories

RANKING	SCORE
Compliant	2
Minor non-compliance	1
Noted/Not Applicable	0
Repeat Condition	-
Moderate non-compliance	-1
Major non-compliance	-2

Description of scores: audit findings are ranked according to the following criteria:

Noted/Not Applicable:

- The specific condition is not relevant to the current on-site activities.

Repeat Condition:

- The specific condition is a repeat of a previous condition.

Compliant:

- Mr. Inyenga I. T. Petrus complies with the conditions as stated in the EMP.

Non-compliance:

- *Minor non-compliance*, isolated observations demonstrating that full compliance to the environmental requirements on site have not been, or will not be, fully achieved.
- *Moderate non-compliance*, substantial failure to meet the environmental requirements for the project, a possibility of substantial environmental degradation and/or pollution, and/or objective evidence is observed raising doubt as to the integrity of data or records inspected
- *Major non-compliance*, there is a critical failure against legal requirements or management response that presents an immediate or significant risk that could result in prosecution and/or adverse legal findings due to failure to meet regulatory requirements; result in immediate injury or serious injury; result in prolonged business outage; and/or could result in serious damage to the project's reputation.

6 ENVIRONMENTAL AUDIT FINDINGS

6.1 INTRODUCTIONS TO THE SCORING CRITERIA

The data collected, in particular the scores obtained under the respective aspect of the small-scale mining activity in relation to the compliance ranking were tabulated in an excel sheet for analysis. Findings from the analysis, is interpreted as follows:

- A score range of between 80 and 100 % represents, exceptional complete
- A score range of between 50 and 79 % represent moderate compliance
- A score below fifty (50) represents the three scale non-compliance categories i.e. “Minor non-compliance = 26 – 49 percent, “moderate non-compliance = 10 – 25 percent, and major non-compliance = 0 – 9 %.

The summary of the findings of the audit are included in (Fig. 7) of this Report. The audit findings also include practical recommendations whereby the various non-compliance issues can be corrected.

6.2 SYNTHESIS OF AUDIT FINDINGS

The audit findings, suggests that with a combine (compliance, repeated and not applicable) ranking percentage of 89 % (Fig. 7), Inyenga’s Marble Mine activities can be confidently declared as compliant. Critically, the non-compliant (minor non-compliance) ranking causing a compliance deficit leans significantly towards the positive tip of scoring scale, implying partial adherence with the given EMP / ECC conditions.

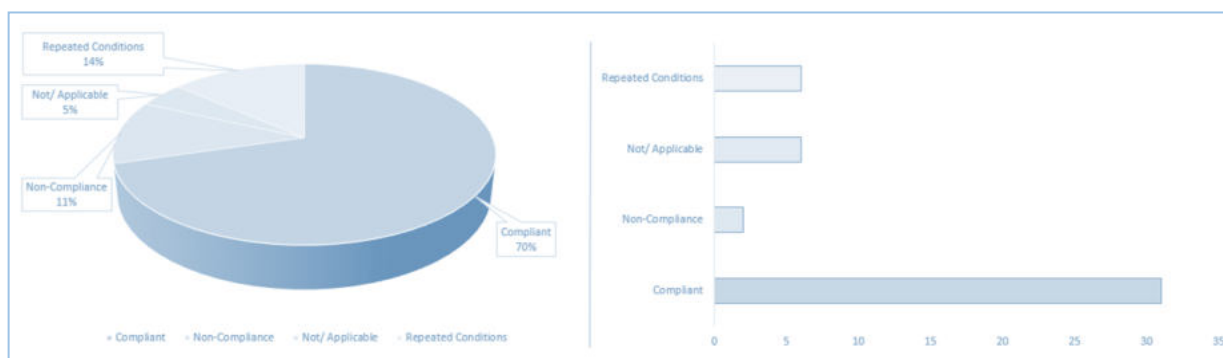


Fig. 7: Shows an illustrative of the break-down of Inyenga Marble Mine compliance with the environmental obligations

Where non-compliances were recorded, the auditor contextualised the non-compliance in terms of the intensity. This equates to an objective view of the seriousness of the non-compliance and then leads to recommendations where minor to moderate non-compliances have been observed. Some of the non-compliances assessed have action plans that are either being compiled or are in place and will seek to reduce and eliminate the non-compliances.

Overall, with an 89 % compliance rate, Enviro-Leap Consulting is confident to provide a positive recommendation and in favour of the renewal of the Mr. Inyenga I. T. Petrus expiring environmental clearance certificate by the Department of Environmental Affairs and Forestry (DEAF).

• **Table 6:** Tabulation of the observed Mr. Inyenga I. T. Petrus environmental compliance ranking per the respective environmental obligations

DATE	September 2020					SITE	EPLs 4817 and 4833
No.	Aspect	Conditions	Status	Score	Observations	Recommendations	
1	Authorisation and Agreements (Schedules, Permits and Licences)	Sign and honour agreements (Surface Use-Agreements) set out in the site-access contracts	Compliant	2	Surface use agreements signed	Update accordingly in relation to licenses expiry / review period	
2		Relevant and applicable permits must be obtained for the removal of any fauna or Flora species (particularly protected species).	Compliant	2	Permits were obtained and if need for others will be	No recommendations are applicable, other than that they must be renewed timely	
3		Heritage compliance: compile and maintain a chance find emergency procedure plan which includes the following	Compliant	2	Procedures are in place	No recommendations are applicable	
4		Licenses in terms of the Water Resource Management Act (Act No. 11 of 2013) will be obtained for all drilled holes (not just boreholes).	Compliant	2	Water abstraction permit was obtained	No recommendations are applicable, other than that they must be renewed timely	
5		Schedule exploration activities in such a way that disturbances to hunting operations is minimized	Compliant	2	No activities occur in hunting season	No recommendations are applicable	
6		An agreement to abstract water from existing boreholes must be included in the land access agreement	Compliant	2	See condition No. 2	No recommendations are applicable, other than that they must be renewed timely	
7	Stakeholder engagement, training and awareness raising	Compile and maintain a stakeholder engagement plan, through which regular feedback regarding activities on the individual properties is conducted	Compliant	2	Stakeholder engagement plan in place and used	No recommendations are applicable	
8		Land owners to be provided with a list of all people working on site along with a photographic key for easy identification.	Compliant	2	List of all staff has been provided to land owners	No recommendations are applicable	
9		All staff operating on site will be provided with identification and proof that they are working for the applicant	Minor non-compliance	1	No specially provided staff ID cards	Design specific staff ID cards and have these available at all times	
10							

DATE	September 2020			SITE	EPLs 4817 and 4833	
No.	Aspect	Conditions	Status	Score	Observations	Recommendations
11	Stakeholder engagement, training and awareness raising	Awareness raising and training on the value of biodiversity and need to conserve the species and systems within the project area must be conducted	Minor non-compliance	1	No formal training has been provided but awareness	Specially designed short-courses on biodiversity conservation must be conducted
12		No new access tracks shall be created where alternatives exists, and speed limits signage and awareness must be enforced to prevent road kills.	Compliant	2	Current assess is strictly limited to existing tracks	No recommendations are applicable
13		Mr. Inyenga I. T. Petrus will provide training and environmental awareness to its employee and contractors on the use of spill kits in order to enable containment and remediation of pollution incidents.	Minor non-compliance	1	No formal training has been provided but awareness	Specially designed short-courses on spillage management and appropriate use of spill kit must be conducted
14		Employees and contractors will be sensitized on correct waste disposal and sustainable practices e.g. recycling.	Minor non-compliance	1	No formal training has been provided but awareness	Awareness on appropriate waste management (disposal) must be conducted
15	Air quality – dust & gas emissions	Vehicle speeds limit of below 40km/h on access routes must be enforced to limit dust, and where practical dust suppressants must be applied.	Compliant	2	Strict compliance with speed limit was observed	No recommendations are applicable
16		The movement of drilling related vehicles on the unpaved access track will be on a small scale	Compliant	2	Strict compliance was observed	No recommendations are applicable
17		Vehicles and the drilling rig will be maintained in good working order	Compliant	2	Strict compliance was observed	No recommendations are applicable
18		Vehicle speeds limit of below 40km/h on access routes must be enforced to limit dust, and where practical dust suppressants must be applied.	Compliant	2	Strict compliance with speed limit was observed	No recommendations are applicable

DATE	September 2020			SITE	EPLs 4817 and 4833	
No.	Aspect	Conditions	Status	Score	Observations	Recommendations
19	Noise Pollution / Nuisance	Drill site are to be cited more than 200 metres away from any residential infrastructure	Compliant	2	No drill site in close proximity to houses	No recommendations are applicable
20		Vehicle speeds limit of 30km/h on access routes must be enforced to limit dust, and where practical dust suppressants must be applied.	Compliant	2	Strict compliance with speed limit was observed	No recommendations are applicable
21		Drill operations are to be limited to daylight working hours (07 am – 17 pm) so as to avoid noise generation during resting hours	Compliant	2	Strict compliance with working hours was observed	No further recommendations are applicable but to continue as required
22	Heritage and Land-use	The drilling activities footprint must be minimized as far as is practically possible i.e. drill sites must be demarcated and fenced off with tape to ensure that all scheduled activities are contained and all tapes removed upon completion.	Compliant	2	Evidence of footprint management and proper demarcation of sites observed	No recommendations are applicable
23		Agree on relevant compensation with land-owners where impacts on existing land-uses cannot be avoided	Compliant	2	No need was observed to date	This condition must remain valid and applicable should need arise
24		Adopt use of contour lines, avoiding creation furrows, channels, and erection of berms when creating access tracks and or digging sampling trenches to minimize erosion	Compliant	2	Evidence of appropriate tracks and drilling orientation observed	This condition remain valid and applicable should need arise
25		Invite land owners and independent environmental practitioner to conduct site inspections following rehabilitation and certify closure site closure.	Not / Applicable	0	No rehabilitation work has been conducted yet	This condition remain valid and applicable should need arise
26		No drilling activities to take place in close proximity (within 500 m) of any farm dam, and 200 m from residential infrastructure.	Compliant	2	Strict compliance has been observed	No recommendations are applicable

DATE	September 2020			SITE	EPLs 4817 and 4833	
No.	Aspect	Conditions	Status	Score	Observations	Recommendations
27	Biodiversity (Fauna and Flora)	Minimize as far as is practically possible, the footprint of the area to be disturbed during surveying/mapping.	Compliant	2	Evidence of footprint survey and mapping impacts	Contenance using low impact methods
28		Pits and trenches must be opened and closed on the same day or fenced off until such time as they can be closed, and must be dug smaller animals to exit the pits/trenches if they fall into them.	Not / Applicable	0	Exploration has not advance to tranches but limited to drilling only	This condition remains valid and applicable to when need for trench digging becomes necessary
29		No new access tracks shall be created where alternatives exists to prevent vegetation clearing and speed limits must be enforced to prevent road kills	Compliant	2	Current assess is strictly limited to existing tracks	No recommendations are applicable
30		A floral survey of all drill sites need to be conducted prior to establishment to ensure that no protected species are destroyed.	Minor non-compliance	1	No formal survey report provided but promised one	Evidence of written flora survey must be provided during the next review and reporting period
31		Provide appropriate portable toilet facilities for the exploration workers at the drill sites	Compliant	2	Flush toilets available to all staff	No recommendations are applicable
32		Water levels will be measured prior to abstraction, during abstraction (daily) and after completion. Levels will be reported to land owners.	Compliant	2	Strick compliance through farm borehole reporting	No recommendations are applicable
33		Avoid residences, game and livestock enclosures where possible	Compliant	2	Strict compliance observed	No recommendations are applicable
34		Where possible, avoid air surveys during hunting season (1 February until 30 November). Where not possible, schedule exploration activities in such a way that disturbances to hunting operations are minimized.	Not / Applicable	0	There has been no aerial survey's conducted but schedule is compliant	No recommendations are applicable

DATE	September 2020			SITE		
No.	Aspect	Conditions	Status	Score	Observations	Recommendations
35	Waste Management and Pollution Control	Spillages containment such as impermeable floors and bunded trays are employed to contain a 110% of the volume of the hazardous substances stored and handled on site	Minor non-compliance	1	No adequate bunded trays, although there some attempts to control spills	Employ full impermeable and bunded trays at generator and workshop (Fuel storage facility)
36		A PVC lined sump will be used for collection of oils and silt contained in the drilling water	Compliant	2	Evidence of PVC lined sumps observed	No recommendations are applicable
37		Spill kits will be readily available and provided to employees and/or contractors,	Compliant	2	Spill kits available on site though under utilised	Training and or awareness of these kits seem inadequate and thus recommended
38		All re-fuelling and any maintenance of vehicles will take place on impermeable surfaces	Compliant	2	Compliance observed given the scale	Improvements might be necessary with expansion of activities
39		Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm.	Compliant	2	Flush toilets available to all staff	No recommendations are applicable
40		Waste will be removed from site and disposed-off at a suitable licensed waste disposal facility.	Compliant	2	Solid and Effluent wastes well managed	No recommendations are applicable
41		Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at a licenced hazardous waste disposal facility (Kupferberg).	Not / Applicable	0	There has not been extensive use of hazardous substances on site	Condition remains valid and must be adhered to as it becomes applicable
42		Decommission temporary ablution facilities and remove all waste generated during activities from the drill site and dispose it off appropriately	Repeated Condition	-	This is only applicable at closure and rehabilitation	Condition remains valid and must be adhered to as it becomes applicable
43	Closure	Land owners will be invited to carry out site inspections following rehabilitation in order to ensure that it has been carried out suitably.	Not / Applicable	0	There has not been rehabilitation works done yet	Condition remains valid and must be adhered to as it becomes applicable
44		Decommission ablution facilities and Ensure that all waste generated during activities is removed from the base-camp site and disposed of appropriately	Repeated Condition	-	This is only applicable at closure and rehabilitation	Condition remains valid and must be adhered to as it becomes applicable

8 ENVIRONMENTAL STATEMENT & RECOMMENDATIONS

The audit findings, suggests that with a combine (compliance, repeated and not applicable) ranking percentage of 89 % (Fig. 7), Inyenga's Marble Mine activities can be confidently declared as compliant. Critically, the non-compliant (minor non-compliance) ranking causing a compliance deficit leans significantly towards the positive tip of scoring scale, implying partial adherence with the given EMP / ECC conditions.

Where non-compliances were recorded, the auditor contextualised the non-compliance in terms of the intensity. This equates to an objective view of the seriousness of the non-compliance and then leads to recommendations where minor to moderate non-compliances have been observed. Some of the non-compliances assessed have action plans that are either being compiled or are in place and will seek to reduce and eliminate the non-compliances.

Overall, with an 89 % compliance rate, Enviro-Leap Consulting is confident to provide a positive recommendation and in favour of the renewal of the Mr. Inyenga I. T. Petrus expiring environmental clearance certificate by the Department of Environmental Affairs and Forestry (DEAF).

REFERENCES

- Barnard, P. 1998. Overview of Namibia and its biological diversity. In: Barnard, P (ed.). *Biological Diversity in Namibia – a country study*. Windhoek: Namibian National Diversity Task Force, pp. 57-187.
- Barnard, P. 1998. Biodiversity of terrestrial and freshwater habitats. In: Barnard, P (ed.). *Biological Diversity in Namibia – a country study*. Windhoek: Namibian National Diversity Task Force, pp. 57-187.
- Directorate of Environmental Affairs, 2008. Procedures and Guidelines for Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP), Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek.
- Government of the Republic of Namibia. 2004. Namibia Vision 2030: Policy Framework for Long-Term National Development. Office of the President, Windhoek.
- Geological Survey of Namibia, 1999. Regional geological map of Namibia. Ministry of Mines and Energy, Windhoek, Namibia.
- Government Gazette, 27 December 2007. No. 3966, Act No. 7, 2007 Environmental Management Act 2007.
- Griffin, M. 2000. The species diversity, distribution and conservation of Namibian reptiles: a review. *Namibia Wissenschaftliche Gesellschaft* 48: 116-141.
- Giess, W. 1971. A Preliminary Vegetation Map of South West Africa. *Dinteria* 4: 1-114.
- Maggs, G.L., Craven, P. & Kolberg, H.H. 1998. Plant species richness, endemism, and genetic resources in Namibia. *Biodiv. Cons.* 7: 435-446.
- Mendelsohn, J. 2009. Atlas of Namibia: a portrait of the land and its people. David Philip, 2012.
- Simmons, RE, Griffin, M, Griffin, RE, Marais, E & Kolberg, H. 1998. Endemism in Namibia: patterns, processes and predictions. *Biodiversity and Conservation* 7(4): 513-530.
- SLR. 2014. Scoping Report (including impact assessment) Assessment Report for Mr. Michael I. T. Petrus Proposed Exploration activities on EPL 4817 and EPL 4833.

APPENDICES

APPENDIX A – PREVIOUS ENVIRONMENTAL CLEARANCE CERTIFICATE

