

APPENDIX 4

Impact Assessment



REGISTRATION NUMBER: 2018/110720/07

Appendix 4

IMPACT ASSESSMENT:

APPLICATION FOR ENVIRONMENTAL AUTHORISATION TO OBTAIN A MINING PERMIT FOR A PROPOSED BORROW PIT ON THE REMAINDER OF THE FARM DIE PLAAS 210 (VLAKTEFONTEIN 210), LADY GREY DISTRICT, EASTERN CAPE

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Assessment methodology

The environmental significance assessment methodology is based on the following determination:

$$\text{Environmental Significance} = \text{Overall Consequence} \times \text{Overall Likelihood.}$$

Determination of Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: Severity/Intensity, Duration and Extent/Spatial Scale. Each factor is assigned a rating of 1 to 5, as described in the tables below.

Determination of Severity

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment is (Table 1).

Table 1: Rating of severity

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant / Harmful	Great / Very harmful	Disastrous / Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance / Easily reversible	Low cost to mitigate	Substantial cost to mitigate / Potential to mitigate impacts / Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate / Little or no mechanism to mitigate impact / Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

Determination of Duration

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place (Table 2).

Table 2: Rating of Duration

Rating	Description
1: Low	Almost never / almost impossible
2: Low-Medium	Very seldom / highly unlikely
3: Medium	Infrequent / unlikely / seldom
4: Medium-High	Often / regularly / likely / possible
5: High	Daily / highly likely / definitely

Determination of Extent/Spatial Scale

Extent refer to the spatial influence of an impact be local (extending only as far as the activity or will be limited to the site and its immediate surroundings), regional (will have an impact on the region), national (will have an impact on a national scale) or international (impact across international borders) (Table 3).

Table 3: Rating of Extent / Spatial Scale

Rating	Description
1: Low	Immediate, fully contained area
2: Low-Medium	Surrounding area
3: Medium	Within Business Unit area of responsibility
4: Medium-High	Within Warden area
5: High	Regional, National, International

Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarised below, and then dividing the sum by 4 (Table 4).

Table 4: Example of calculating Overall Consequence

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
SUBTOTAL	Example 10
TOTAL CONSEQUENCE:(Subtotal divided by 4)	Example 2.5

Likelihood

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described and in Tables 5 and 6.

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken (Table 5).

Table 5: Rating of frequency

Rating	Description
1: Low	Once a year or once / during construction / LOM
2: Low-Medium	Once / more in 6 Months
3: Medium	Once / more a Month
4: Medium-High	Once / more a Week
5: High	Daily

Determination of Probability

Probability refers to how often the activity/event or aspect has an impact on the environment (Table 6).

Table 6: Rating of probability

Rating	Description
1: Low	Almost never / almost impossible
2: Low-Medium	Very seldom / highly unlikely
3: Medium	Infrequent / unlikely / seldom
4: Medium-High	Often / regularly / likely / possible
5: High	Daily / highly likely / definitely

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2 (Table 7).

Table 7: Example of calculating the overall likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
SUBTOTAL	Example 6
TOTAL LIKELIHOOD (Subtotal divided by 2)	Example 3

Determination of Overall Environmental Significance

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of LOW, LOW-MODERATE, MODERATE MODERATE-HIGH or HIGH, as shown in the table below (Table 8).

Table 8: Determination of overall environmental significance

Significance or Risk	Low	Low-Moderate	Moderate	Moderate-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision-making process associated with this event, aspect or impact (Table 9).

Table 9: Description of the environmental significance and the related action required.

Significance	Low	Low-Moderate	Moderate	Moderate-High	High
Impact Magnitude	Impact is of very low order and therefore likely to have very little real effect. Acceptable.	Impact is of low order and therefore likely to have little real effect. Acceptable.	Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to the company	Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable	Impact is of the highest order possible. Unacceptable. Fatal flaw.
Action Required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

1.1 Environmental Impact Assessment of borrow pit at proposed site

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Proposed Site									
Activity and potential impacts	Mitigation	Significance with or without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
<p>Clearance of vegetation and removal of topsoil and overburden</p> <ul style="list-style-type: none"> • Loss of natural occurring vegetation • Establishment of alien species in the surrounding area • Erosion • Soil loss • Aesthetic impact • Siltation and contamination of drainage lines 	<ul style="list-style-type: none"> • Clearance of vegetation will be limited to the area under development, within the registered servitudes. No additional land will be acquired. • Establishment of alien vegetation should be monitored on a regular basis. • Areas with extensive growth of alienated species should be removed by hand. • In the instance where a protected species is encountered (unlikely at this site) transplant within the servitude to an area where they will not be affected by construction. • In cases where topsoil is to be removed from the construction area, the topsoil should be stockpiled. • No open fires will be allowed. • The site will always be kept clean and neat by correct waste disposal measures and housekeeping. • Stormwater management will be implemented to avoid 	<p>Without: 5 (Low-Moderate) With: 2.5 (Low)</p>	<p>3 2</p>	<p>3 2</p>	<p>2 1</p>	<p>2 1.25</p>	<p>1 1</p>	<p>4 3</p>	<p>2.5 2</p>

Proposed Site									
Activity and potential impacts	Mitigation	Significance with or without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
	contamination and siltation of drainage lines.								
Waste Management <ul style="list-style-type: none"> • General Waste • Construction Waste • Aesthetic impact 	<ul style="list-style-type: none"> • Suitable receptacles should be placed at convenient areas (where construction is active) for the collection of general waste and construction waste. • These receptacles should be emptied on a regular basis (or when necessary) and disposed of at the nearest authorized landfill site. • Scrap metal and other recyclable material should be collected and sold to a local recycler. • Temporary ablution facilities must be made available on site during the construction phase. • These facilities must be implemented in such a way that no water or other resources are polluted by these facilities. • A contractor should clean the facilities on a regular basis. Proof of the cleaning schedule should be made available on request. • The site will always be kept clean and neat by correct waste disposal measures and housekeeping. 	Without: 7.9 (Low-Moderate) With: 4.4 (Low)	3 2	4 4	2 1	2.25 1.75	4 3	3 2	3.5 2.5
Storm Water Management <ul style="list-style-type: none"> • Potential Pollution to Storm Water • Erosion 	<ul style="list-style-type: none"> • Appropriate storm water measures. • Low berm around the perimeter, and Culverts will be constructed to 	Without: 7 (Low-Moderate)	3 2	3 2	2 1	2 1.25	4 3	3 2	3.5 2.5

Proposed Site									
Activity and potential impacts	Mitigation	Significance with or without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
<ul style="list-style-type: none"> Contamination of the downstream receiving environment 	<ul style="list-style-type: none"> prevent any pollution or erosion and to divert any storm water around construction sites. Stormwater management will be implemented to avoid contamination of the downstream receiving environment 	With: 3.1 (Low)							
Protection of cultural environment <ul style="list-style-type: none"> The cultural environment (if any) could be harmed due to the construction activities. 	<ul style="list-style-type: none"> If any signs of culturally or historically significant elements (including archaeological or paleontological elements) are discovered during the construction of the infrastructure all activities on and close to the discovery should discontinue. An archaeologist and/or paleontologist should be notified. SAHRA should be notified. The activities may continue if the contractor received written consent from SAHRA and / or the specialists (paleontologist / archaeologist). 	Without: 3.1 (Low) With: 2.5 (Low)	3 2	1 1	1 1	1.25 1	4 4	1 1	2.5 2.5
Excavation <ul style="list-style-type: none"> Noise and dust generation. Contamination of ground- or surface water. Aesthetic impact 	<ul style="list-style-type: none"> Mining activities should be limited to normal working hours in order to limit the significance of the noise levels. A speed limit will be enforced on vehicles. Dust control measurements will be investigated if nuisance dust generation proofs to be problematic. 	Without: 13.5 (Moderate) With: 7 (Low-Moderate)	3 2	5 4	4 1	3 1.75	5 5	4 3	4.5 4

Proposed Site									
Activity and potential impacts	Mitigation	Significance with or without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
	<ul style="list-style-type: none"> The site will always be kept clean and neat by correct waste disposal measures and housekeeping. Stormwater management will be implemented to avoid contamination and siltation of the watercourse 								
Stockpiling <ul style="list-style-type: none"> Erosion. Invasion of alien plant species. Contamination of ground- or surface water. Soil contamination. Aesthetic impact Siltation of the downstream environment and drainage lines. 	<ul style="list-style-type: none"> Storm water will be managed from and around stockpiles to avoid erosion. Alien vegetation will be managed. The site will always be kept clean and neat by correct waste disposal measures and housekeeping. Stormwater management will be implemented to avoid contamination and siltation of the watercourse. 	Without: 10.5 (Moderate) With: 4.4 (Low)	3 2	5 4	4 1	3 1.75	4 3	3 2	3.5 2.5
Loading and transportation <ul style="list-style-type: none"> Noise and dust generation. Surface compaction. 	<ul style="list-style-type: none"> Mining activities should be limited to normal working hours in order to limit the significance of the noise levels. A speed limit will be enforced on vehicles. Dust control measurements will be investigated if nuisance dust generation proves to be problematic. 	Without: 12 (Moderate) With: 6.8 (Low)	3 2	5 4	4 1	3 2.25	4 3	4 3	4 3

Conclusion

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The proposed project entails the following:

The mining activities will entail the clearance of the proposed mining area (i.e. 4.98 ha) of vegetation and topsoil which will be stockpiled and the removal of overburden. The gravel will be excavated using an excavator, loaded onto trucks and hauled to road construction sites on the R58 national road. The activities will have a duration of at least 2 years. The mining permit is valid for 2 years, after which the applicant can apply for extension.

Impacts associated with the proposed project as indicated in the Impact Assessment:

With the implementation of the correct mitigation measures to limit the potential impacts on the environment, all impacts will have a low or low - moderate significance rating.

In conclusion, if all the recommended measures are implemented, the significance of the impacts expected to be associated with the proposed borrow pit will be low.

Discussion on the 'no-go' alternatives:

No environmental impacts will occur if the no-go alternative is accepted. However, the opportunity for employment creation will be lost and the opportunity to provide gravel for construction purposes will be lost. The opportunity to increase road safety for the communities of the surrounding area, and greater population of South Africa, will be lost.

After consideration of the Impact Assessment the following conclusions are drawn:

Proposed site:

- The most significant impact of the proposed activity is the aesthetic impact, as well as the dust and noise generation due to excavation, loading and transportation. However, should all the mitigation factors be implemented the environmental impact will be low.