

APPENDIX: 5

Impact Assessment



TURN180
ENVIRONMENTAL CONSULTANTS

DRAFT IMPACT ASSESSMENT:

**IMPACT ASSESSMENT FOR THE S&EIR PROCESS FOR
THE PROSPECTING RIGHT FOR THE PROPOSED
PROSPECTING FOR DIAMONDS ON THE REMAINDER,
PORTION 1 AND PORTION 16 OF THE FARM
JAGERSFONTEIN 14, FAURESMITH DISTRICT, FREE
STATE PROVINCE**

DMR Ref: FS 30/5/1/1/3/2/1 (10505) EM

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Applicant:

Contact: Mr. Pieter Meyer
Address: P.O. Box 24
Jagersfontein
9974
Tel: 018 297 2090

Prepared by:



PROJECT TEAM

Environmental Assessment Practitioner(s):	Louis De Villiers
Postal address:	Suite 221 Private Bag X01 Brandhof 9324
Contact person(s):	Louis de Villiers
Tel:	072 967 7962
E-mail:	louis@turn180.co.za

1. Assessment methodology

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

Environmental Significance = Overall Consequence x Overall Likelihood.

1.1 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 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 (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	Within Prospecting Boundary area
3: Medium	Surrounding area
4: Medium-High	Local (Town boundaries)
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 3.3

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 / more during operation / 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-MEDIUM, MEDIUM, MEDIUM, MEDIUM-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	Implement monitoring. Investigate mitigation measures and improve management measures to	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

Significance	Low	Low-Moderate	Moderate	Moderate-High	High
		potential increase in risk. Where possible improve	reduce risk, where possible.		

1.2 Impact Assessment

Alternative 1 - Proposed Alternatives									
Activity and potential impacts	Mitigation	Significance with and without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
<p>Clearance of site, protection of vegetation and animals</p> <ul style="list-style-type: none"> • Loss of natural occurring vegetation • Establishment of alien species in the surrounding area • Erosion • Soil loss and soil compaction • Contamination of soil, surface and groundwater resulting from hydrocarbon spills. • Loss of animal habitat and animals. • Elevated ambient noise levels • Elevated ambient dust levels • Littering • Loss of heritage artefacts 	<ul style="list-style-type: none"> • Transplant all known protected plant species within the prospecting area which will be affected to an area where they will not be affected by mining. • Topsoil to be removed and stockpiled for use during rehabilitation. • Stormwater will be diverted around the prospecting area. • Clearance of vegetation will be limited to the prospecting area. 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. • No open fires will be allowed. • No animals will be harmed or killed on site. 	<p>Without: 10.7 (Moderate) With: 4.2 (Low)</p>	<p>3 2</p>	<p>3 2</p>	<p>2 1</p>	<p>2.7 1.7</p>	<p>5 5</p>	<p>3 1</p>	<p>4 2.5</p>

Alternative 1 - Proposed Alternatives

Activity and potential impacts	Mitigation	Significance with and without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
	<ul style="list-style-type: none"> • Machinery will be serviced to reduce excessive noise and spillages of petrochemical spills. • Any spills of potentially hazardous substances will be cleaned and managed according to best practices. • No hazardous substances will be stored at the prospecting areas in high volumes. • Bags/bins will be placed at the prospecting areas for the disposal of general waste. • Areas will be monitored during clearance for any heritage and/or palaeontological artefacts. If discovered a heritage specialist will be contacted. 								
<p>Trenching/Pitting</p> <ul style="list-style-type: none"> • Loss of natural occurring vegetation • Establishment of alien species in the surrounding area • Erosion • Soil loss and soil compaction 	<ul style="list-style-type: none"> • The boundaries of the prospecting areas will not be exceeded, • Growth of alien species will be monitored and removed when they are problematic. • Topsoil stockpiles will be monitored 	Without: 13.5 (Moderate) With: 5 (Low - Moderate)	3 2	4 2	3 1	2.3 1.7	5 5	4 1	4.5 3

Alternative 1 - Proposed Alternatives

Activity and potential impacts	Mitigation	Significance with and without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
<ul style="list-style-type: none"> • Contamination of soil, surface and groundwater resulting from hydrocarbon spills. • Loss of animal habitat and animals. • Elevated ambient noise levels • Elevated ambient dust levels • Littering • Loss of heritage artefacts 	<p>and measures (i.e. storm water management measures) will be implemented to reduce the risk of erosion and loss of topsoil,</p> <ul style="list-style-type: none"> • Machinery will be serviced to reduce excessive noise and spillages of petrochemical spills. • Any spills of potentially hazardous substances will be cleaned and managed according to best practices. • No hazardous substances will be stored at the prospecting areas in high volumes. • Bags/bins will be placed at the prospecting areas for the disposal of general waste. • Areas will be monitored during clearance for any heritage and/or palaeontological artefacts. If discovered a heritage specialist will be contacted. • Prospecting activities will be limited to daytime hours close to 								

Alternative 1 - Proposed Alternatives

Activity and potential impacts	Mitigation	Significance with and without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
	<p>Charlesville,</p> <ul style="list-style-type: none"> • If nuisance dust becomes problematic, measures (i.e. dust suppression) will be implemented to limit dust. No work will be done in very windy conditions. • No animals will be hunted on site or the surrounding area and habitats will not be disturbed unnecessarily, • The land will be returned to its land use after prospecting occurred, 								
<p>Loading and Hauling</p> <ul style="list-style-type: none"> • Soil compaction • Clearance of vegetation • Elevated noise levels • Elevated dust levels • Pollution and degradation of watercourse • Spillage of potentially hazardous substances and contamination of soil and surface and groundwater. • Littering 	<ul style="list-style-type: none"> • Existing roads will be used as far as practically possible. New temporary access roads will be made to cover the shortest distance possible from existing roads. • Vehicles will be maintained to limit noise and vehicles will only permitted to travel at a maximum speed of 40km/h. • Existing roads will be used. Dust suppression will be implemented if dust becomes a problem. Travelling and operation will be restricted 	<p>Without: 18 (Moderate - High) With: 9.3 (Low - Moderate)</p>	<p>4 2</p>	<p>4 3</p>	<p>4 3</p>	<p>4 2.7</p>	<p>5 5</p>	<p>4 2</p>	<p>4.5 4.2</p>

Alternative 1 - Proposed Alternatives

Activity and potential impacts	Mitigation	Significance with and without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
	<p>during very windy conditions.</p> <ul style="list-style-type: none"> • New access roads will not be established through or within 100m from watercourses. • Machinery will be serviced to reduce excessive noise and spillages of petrochemical spills. • Any spills of potentially hazardous substances will be cleaned and managed according to best practices. • No hazardous substances will be stored at the prospecting areas in high volumes. Bags/bins will be placed at the prospecting areas for the disposal of general waste. 								
<p>Rehabilitation</p> <ul style="list-style-type: none"> • Loss of topsoil through erosion and mismanagement, • Littering, • Soil and water (surface and underground resources) contamination from spillages and siltation, 	<ul style="list-style-type: none"> • Topsoil stockpiles will be monitored for erosion. Stormwater will be diverted around stockpiles to prevent erosion. Topsoil will be returned to the rehabilitated trenches. • Suitable receptacles should be placed at convenient areas (where 	<p>Without: 10.5 (Moderate) With: 5.8 (Low-Moderate)</p>	<p>3 2</p>	<p>3 2</p>	<p>3 1</p>	<p>3 1.7</p>	<p>5 5</p>	<p>2 2</p>	<p>3.5 3.5</p>

Alternative 1 - Proposed Alternatives

Activity and potential impacts	Mitigation	Significance with and without mitigation	Severity	Duration	Extent	Consequence	Frequency	Probability	Likelihood
<ul style="list-style-type: none"> • Elevated noise levels, • Elevated dust levels, • Alien vegetation. 	<p>activities occur) for the collection of general waste.</p> <ul style="list-style-type: none"> • Petrochemical spills will be cleaned and managed according to best practices. Large volumes of hazardous substances will not be stored at the prospecting areas. • Machinery will be serviced to reduce noise levels. Working will be limited to normal 								

Conclusion:

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.

It should be noted that the prospecting activities will be temporary and that further mining activities will only occur after an application is made for a mining right on the Remainder, Portion 1 and Portion 16 of the farm Jagersfontein 14, Fauresmith District of the Free State Province should the results of the prospecting indicate that further diamond mining will be feasible. All trenches made during prospecting will be rehabilitated and closed after testing of the material. Mining cannot occur before the Environmental Authorisation and a Mining Right is not issued.

Furthermore, the prospecting operation will be undertaken simultaneously with the current tailings operation. The process plant of the tailings operation will be used to process the material during prospecting and the water use will remain as it is currently is under the existing Water Use License issued by the Department of Water and Sanitation. Most of the proposed areas where prospecting is expected to occur will be on areas which have been disturbed by historic mining activities and the current tailings operation. However, when prospecting occurs on areas with indigenous vegetation the applicant will implement the mitigation and management measures to prevent and/or reduce impacts from occurring. Care will also be taken when conducting prospecting activities near watercourses or upstream of watercourses not to impact on them.

The prospecting activities will be subject to Environmental Compliance Monitoring and an annual Environmental Performance Assessment will be undertaken and the report will be submitted to the Department of Mineral Resources.