

# **APPENDIX F**

## **Impact Assessment**



## **IMPACT ASSESSMENT**

**THE RECTIFICATION OF THE UNLAWFUL COMMENCEMENT OF A LISTED ACTIVITY: THE ESTABLISHMENT OF AN ASPHALT PLANT ON PORTION 57 OF THE FARM STRATHMORE 214, NELSPRUIT DISTRICT, MPUMALANGA.**

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**Prepared by:**



**Environmental Assessment** : Louis De Villiers  
**Practitioner (EAP)**  
**Assistant to the EAP and project contact person** : Ansuné Weitsz  
**Postal Address** : Suite 221  
Private Bag X01  
Brandhof  
9324  
**Physical Address** : 21 Dromedaris Street  
Dan Pienaar  
Bloemfontein  
9301  
**Tel** : 072 873 6665  
**Cell** : 072 838 8189/  
072 967 7962  
**E-mail** : [admin@turn180.co.za](mailto:admin@turn180.co.za)  
[ansune@turn180.co.za](mailto:ansune@turn180.co.za)

**Applicant:**

At-Road Construction (Pty) Ltd

**Applicant Contact Person** : Mr. Marius Prinsloo  
**Postal Address** : P.O. Box 43715  
Heuwilsig  
Bloemfontein  
9332  
**Physical Address** : 25 Bloemendal Road  
Rayton  
Bloemfontein  
9302  
**Tel** : 051 436 4891  
**Cell** : 082 450 8957  
**E-mail** : [mprinsloo@taupele.co.za/](mailto:mprinsloo@taupele.co.za/)  
[admin@taupele.co.za](mailto:admin@taupele.co.za)

**Site Information:**

Farm name and number : Strathmore 214  
Portion : 57  
21 Digit Surveyors Code : T0JU0000000021400057  
District : Nelspruit  
District Municipality : Ehlanzeni District Municipality  
Local Municipality : Nkomazi Local Municipality  
Site coordinates (Centre of site) : 25° 31'55.52"S and 31° 27'2.48"E

## 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 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 (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)	Insignificant change / deterioration	Moderate change / deterioration	Significant change / deterioration	Very significant change / deterioration	Disastrous change / deterioration

Type of criteria	Rating				
	1	2	3	4	5
and quality, waste production, fauna and flora)	or disturbance	n or disturbance	n or disturbance	or disturbance	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	1 Month
2: Low-Moderate	1 – 3 Months
3: Moderate	More than 3 Months
4: Moderate-High	5 – 10 Years
5: High	More than 10 Years

#### Determination of Extent/Spatial Scale

Extent refers to the spatial influence of an impact, be it contained to the immediate surroundings (site), extending to the surrounding area, 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 (site)
2: Low-Moderate	Surrounding Area
3: Moderate	Regional
4: Moderate-High	National
5: High	International

#### Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarised below, and then dividing the sum by 3 (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 3)	Example 3.3

**1.2. Determination of 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 / once during construction
2: Low-Moderate	Once / more in 6 Months
3: Moderate	Once / more a Month
4: Moderate-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-Moderate	Very seldom / highly unlikely
3: Moderate	Infrequent / unlikely / seldom
4: Moderate-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**

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

### 1.3. 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.	Maintain current management measures.	Implement monitoring. Investigate mitigation	Improve management measures to reduce risk.	Implement significant mitigation measures or



Significance	Low	Low-Moderate	Moderate	Moderate-High	High
	Where possible improve.	Implement monitoring and evaluate to determine potential increase in risk. Where possible improve	measures and improve management measures to reduce risk, where possible.		implement alternatives.

## 2. Environmental Impact Assessment

Please note, no Location Alternative will be discussed, as this is a Section 24G process and the Asphalt Plant is already established on the site (the farm Strathmore 214). Although, a Location Alternative was looked at pre-commencement of the activity (the farm Alkmaar 141/286), this location was decided against because of its environmental sensitivity. Therefore, there are no potential impacts for this site, as the Asphalt Plant was established on another site.

### Geology and Soil

The following impacts may occur on the soil as a result of the operational and rehabilitation phases of the activity:

- Potential erosion of exposed soil.
- Contamination of soil due to littering and spillage of petrochemical substances.

It should be noted that the Asphalt Plant is already established on the site and the construction phase is completed. Also, there will be no impact on Geology, as no blasting or excavation takes place during the operational or rehabilitation phases.

1. Potential erosion of exposed soil								
Strathmore 214								
<b>Potential Impact Description:</b>	Due to the site being located on an active mining area, it was cleared of vegetation prior to the establishment of the Asphalt Plant. Due to a lack of vegetation, the soil is more prone to erosion during heavy rainfall events.							
<b>Duration of Impact:</b>	During the operational and rehabilitation phases							
	Operational phase							
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	2	2	1	1.66	3	4	3.5	5.81
<b>With Mitigation</b>	1	1	1	1	2	3	2.5	2.5

<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Appropriate storm water management measures should be implemented around the site in order to prevent water from rainfall events from flowing across the site and causing erosion.</li> <li>• During extremely windy conditions, the exposed dirt areas of the site should be sprayed with water in order to prevent wind erosion.</li> </ul> <p><b>It should be noted that the site contains numerous buildings and the soil is also compacted due to heavy vehicle movement. Therefore, the impact of wind erosion on soil is not expected to be very significant.</b></p>							
<b>Rehabilitation Phase</b>								
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	3	2	1	2	4	4	4	8
<b>With Mitigation</b>	2	1	1	1.33	3	4	3.5	4.655
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• The site should be monitored after rehabilitation for any erosion trenches.</li> <li>• If any erosion trenches area observed, they should be filled.</li> </ul> <p><b>During rehabilitation, all buildings and infrastructure will be removed from site. Therefore, the impact of erosion on soil may be more significant during the rehabilitation phase, as there will be no more buildings.</b></p>							
<b>Can the Impact be reversed</b>	Yes, the impact can be reversed, as the Asphalt Plant will be located on the site temporarily and the site will be rehabilitated to its former state once the Plant is removed.							
<b>Will the impact cause irreplaceable loss of resource</b>	No. Although erosion may lead to soil loss, soil can be sourced from other areas. However, it is not expected that the impact of erosion will be so great as to lead to significant soil loss.							
<b>Cumulative Impacts</b>	Yes. The site is located on a mining area. Thus, the surrounding area is also disturbed and cleared on vegetation.							

2. Contamination of soil due to littering and spillage of petrochemical substances.								
Strathmore 214								
<b>Potential Impact Description:</b>	During operation and rehabilitation vehicles and/or machinery can have leaks of petrochemical substances which can contaminate the soil. Storage tanks which store hazardous substances such as bitumen, diesel and paraffin can also leak. Also, littering and incorrect handling of waste can also contaminate the soil.							
<b>Duration of Impact:</b>	During the operational and rehabilitation phases							
	Operational phase							
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	4	2	1	2.33	4	5	4.5	10.485
<b>With Mitigation</b>	2	1	1	1.33	3	5	4	5.32
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Spillages of petrochemical substances will be cleaned immediately, and the contaminated soil will be disposed of as hazardous waste.</li> <li>• Drip trays will be placed underneath immobile vehicles and/or machinery.</li> <li>• Vehicles and machinery will be serviced regularly.</li> <li>• Potentially hazardous substances will be stored inside a bunded area with an impermeable surface which has the capacity to store more than 110% of the volume of the substance.</li> <li>• Tanks will be inspected for leaks regularly. If leaks are recorded, they will be repaired.</li> <li>• Bins will be made available on site for the collection of general waste. These bins will be emptied on a regular basis at a registered landfill site.</li> </ul>							
	Rehabilitation Phase							
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	3	2	1	2	3	4	3.5	7

<b>With Mitigation</b>	2	1	1	1.33	2	4	3	3.99
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Spillages of petrochemical substances during rehabilitation will be cleaned immediately, and the contaminated soil will be disposed of as hazardous waste.</li> <li>• Drip trays will be placed underneath immobile vehicles and/or machinery used during rehabilitation.</li> </ul>							
<b>Can the impact be reversed</b>	Yes. If contamination of soil occurs, it can be reversed by the correct cleaning procedures.							
<b>Will the impact cause irreplaceable loss of resource</b>	No.							
<b>Cumulative Impacts</b>	There are other activities in the area, including mining activities and agricultural activities, which can also contribute to soil contamination. This activity can therefore contribute to an already worsening soil quality in the area.							

<b>Summary of impacts</b>				
<b>Potential Impacts</b>	<b>Operational</b>		<b>Rehabilitation</b>	
	<b>Without Mitigation</b>	<b>With Mitigation</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
1. Potential erosion of exposed soil	5.81	2.5	8	4.655
2. Contamination of soil due to littering and spillage of petrochemical substances.	10.485	5.32	7	3.99

<b>Grand Average Total:</b>	8.15 (Low - Moderate)	3.91 (Low)	7.5 (Low - Moderate)	4.32 (Low)
The overall environmental significance indicates that the impact on Soil and Geology will be LOW during the operational phase and the rehabilitation phase with mitigation.				

Note that the Asphalt Plant is already established on site and in operation. However, the Asphalt Plant is temporary of nature and the applicant intends to remove it in future and to rehabilitate the site to its former state. It should be noted that the site is located on an active mining area and was disturbed and cleared of vegetation prior to establishment of the Asphalt Plant. There will be no impact on geology, as no deep excavations or blasting occurs during operation or will occur during rehabilitation.

Anticipated impacts of this activity on Soil and Geology include potential erosion of exposed soil and contamination of soil due to littering and spillage of petrochemical substances.

The impact of potential erosion of exposed soil is expected to be LOW - MODERATE during the operational phase without mitigation. With the implementation of the correct mitigation measures as discussed above, the impact can be reduced to LOW. It should be noted that the site is compacted and contains buildings, which reduces the chances of erosion. During rehabilitation the impact of erosion is more significant, although still LOW – MODERATE without mitigation and LOW with mitigation. The buildings on site will be removed and the exposed soil will be more prone to erosion.

The impact of contamination of soil due to littering and spillage of petrochemical substances is expected to have a rating of MODERATE during the operational phase without mitigation, as the activity includes the storage of a large amount of petrochemical substances which may contaminate the soil. This impact can be reduced to LOW – MODERATE with the correct mitigation and management measures. During the rehabilitation phase there may also be an impact due to leaks from vehicles and machinery used for rehabilitation. However, this impact is expected to be LOW with the correct mitigation.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

The only cumulative impacts that are expected is erosion and contamination of soil on site may add to the worsening condition of the soil in the area due to the surrounding land uses.

Proposed mitigation:

- Appropriate storm water management measures should be implemented around the site in order to prevent water from rainfall events from flowing across the site and causing erosion.
- During extremely windy conditions, the exposed dirt areas of the site should be sprayed with water in order to prevent wind erosion.
- Keep the footprint of the site as small as practicable possible in order to limit the impact – no extension of the initial site footprint.
- Equipment and machinery on site will be maintained and drip trays will be used to prevent spillages of petrochemical products which may cause contamination of soil.
- Any hazardous substances on the site will be stored in a bunded area which consists of an impermeable floor with walls which will have the capacity to contain 110% of the volume of the substance stored therein.
- Any spills of hazardous substances will be cleaned immediately by disposing of the affected soil as hazardous waste.
- Storage tanks will be inspected regularly for leaks and if leaks are detected, they will be fixed immediately.
- Bins will be made available on site for the collection of general waste. These bins will be emptied on a regular basis at a registered landfill site.
- The site should be monitored after rehabilitation for any erosion trenches.
- If any erosion trenches area observed, they should be filled.

## Climate

The following impacts may occur on the climate as a result of the operational and rehabilitation phases of the activity:

- There will be no impact on climate for the activity, as the proposed site is small, and the proposed activities will not release enough emissions to have an impact on the climate.
- The cumulative impact of numerous activities such as mining activities, agricultural activities (such is burning of crops) and vehicle exhaust fumes may impact on the microclimate but will also have an insignificant effect on climate on the larger scale as these activities are only limited to a small area.

1. Climate changes								
Strathmore 214								
<b>Potential Impact Description:</b>	The emissions generated by the Asphalt Plant will not be great enough to directly impact the climate.							
<b>Duration of Impact:</b>	No Impact							
<b>Operational phase</b>								
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	No Impact							
<b>With Mitigation</b>	No Impact							
<b>Mitigation Measures</b>	None							
<b>Rehabilitation Phase</b>								
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	No Impact							
<b>With Mitigation</b>	No Impact							
<b>Mitigation Measures</b>	None							
<b>Can the impact be reversed</b>	There will be no need to reverse any impacts as the activity will have no effect on the climate.							



<b>Will the impact cause irreplaceable loss to resource</b>	There are no impacts on climate.
<b>Cumulative Impacts</b>	There is the possibility that a cumulative effect on the climate can occur. The emissions generated by the Asphalt Plant in conjunction with the surrounding land uses which consists of agricultural activities (burning of crops) and mining activities, along with vehicle emissions from the surrounding roads, may have an impact on the climate. However, this cumulative impact is not expected to be significant.

The impact of the Asphalt Plant on the climate will be small to insignificant as the emissions are not enough to change the climate in the area.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be a small cumulative impact on a larger scale due to the surrounding land uses. However, this cumulative impact is not expected to be significant.

Proposed mitigation:

- None

**Land Use**

The following impacts may occur on the land use and characteristics of the land as a result of the operational phase of the activity:

- The potential to use the land for other activities will be lost.

It should be noted that the Asphalt Plant is already established on the site and the construction phase is completed.

1. Loss of potential to use land for other activities								
	Strathmore 214							
<b>Potential Impact Description:</b>	The Asphalt Plant is located on an active mining area (Strathmore Mine) and was disturbed prior to the establishment of the Plant. Therefore, the only other possible use for the land is related to mining. The site is also very small (1.4 ha).							
<b>Duration of Impact:</b>	During the operational phase							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	1	3	1	1.66	1	5	3	4.98
<b>With Mitigation</b>	1	3	1	1.66	1	5	3	4.98
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Keep operational activities within development boundaries to limit disturbance to surrounding land use.</li> </ul> <p><b>It should be noted that the Asphalt Plant is temporary. The Plant is also located on a mining area and the potential to use the land for anything else is very small.</b></p>							
	<b>Rehabilitation Phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	No impact							
<b>With Mitigation</b>	No impact							

<b>Mitigation Measures</b>	None
<b>Can the impact be reversed</b>	Yes. The Asphalt Plant is temporary, and the applicant intends to remove it in the future.
<b>Will the impact cause irreplaceable loss to resource</b>	No. The site is located on a mining area and the potential to use the land for other activities is small. When the Asphalt Plant is removed the land will be used by the mine again.
<b>Cumulative Impacts</b>	The development will contribute to cumulative impacts, as the surrounding area also consists of numerous developments that have changed the characteristics of the land.

<b>Summary of impacts</b>				
	<b>Operational</b>		<b>Rehabilitation</b>	
<b>Potential Impacts</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
1. Loss of potential to use land for other activities.	4.98	4.98	None	None
<b>Grand Average Total:</b>	4.98 (Low)	4.98 (Low)	None	None
The overall environmental significance indicates that the impact on Land Use will be LOW during the operational phase with mitigation.				

The footprint that was cleared for the Asphalt Plant is only 1.4 ha, which is very small. It should also be noted that the Asphalt Plant is temporary, and the applicant intends to remove the plant in the near future. The site is also located on an active mining area.

The impacts of loss of the potential to use the land for other activities is expected to be LOW with and without mitigation. The site is located on a mining area and the potential to use the land for other activities is small. When the Asphalt Plant is removed the land will be used by the mine again.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be cumulative impacts, as the surrounding area is also developed, and this has led to the loss of land.

Proposed mitigation:

- Keep operational activities within the development boundaries to limit disturbance to the surrounding area.

**Vegetation and Animal Life**

The following impacts may occur on the vegetation and animal life as a result of the operational and rehabilitation phases of the activity:

- Loss of natural occurring vegetation (Baberton Serpentine Sourveld).
- Establishment of alien invasive plant species.
- Destruction of habitat and loss of animal species.

It should be noted that the Asphalt Plant is already established on the site and the construction phase is completed.

1. Loss of natural occurring vegetation (Baberton Serpentine Sourveld)								
	Strathmore 214							
<b>Potential Impact Description:</b>	The site falls within the Baberton Serpentine Sourveld (SVI 13) vegetation type, which is classified as Vulnerable (VU) (Deacon, 2020). However, the site is located on an active mining area and was disturbed and cleared of vegetation prior to the establishment of the Asphalt Plant. A small copse of natural woodland is located adjacent to the Asphalt Plant.							
<b>Duration of Impact:</b>	During operational phase							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	2	2	2	2	2	4	3	6
<b>With Mitigation</b>	1	1	1	1	1	4	2.5	2.5
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>The footprint of the site may not be expanded, to protect the copse of woodland adjacent to the site.</li> </ul> <p><b>It should be noted that there is no vegetation present on the site itself as it was cleared long before the Asphalt Plant was established.</b></p>							
	<b>Rehabilitation Phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	No Impact							
<b>With Mitigation</b>	No Impact							
<b>Mitigation Measures</b>	None							
<b>Can the impact be reversed</b>	Yes. The impact on vegetation during the operational phase is expected to be low, as the site is already cleared. The Asphalt Plant is also temporary and will be removed in future. The site belongs to the Strathmore Mine and if the mine is decommissioned in the future, the site will most likely be completely rehabilitated.							

<b>Will the impact cause irreplaceable loss to resource</b>	No.
<b>Cumulative Impacts</b>	A cumulative impact may occur, as some surrounding areas have also been cleared of natural occurring vegetation for mining activities.

<b>2. Establishment of alien invasive plant species.</b>								
	Strathmore 214							
<b>Potential Impact Description:</b>	The site was cleared of vegetation and disturbed through mining activities prior to the establishment of the Asphalt Plant. This, along with operational activities has disturbed the site and may lead to the establishment of invasive alien species.							
<b>Duration of Impact:</b>	During the operational and rehabilitation phase							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	3	2	1	2	3	4	3.5	7
<b>With Mitigation</b>	2	1	1	1.66	2	4	3	4.98
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Establishment of alien vegetation should be monitored and removed on a regular basis.</li> <li>• Operational activities should be confined to the site to limit disturbance.</li> </ul>							
	<b>Rehabilitation Phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	3	2	1	2	3	1	2	4

<b>With Mitigation</b>	2	1	1	1.66	2	1	1.5	2.49
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>Establishment of alien vegetation should be monitored and removed on a regular basis.</li> </ul>							
<b>Can the impact be reversed</b>	Yes. With regular removal of alien vegetation, the impact can be reversed. The Asphalt Plant is also temporary, and the site will be rehabilitated in the near future.							
<b>Will the impact cause irreplaceable loss to resource</b>	No. The establishment of alien vegetation will not lead to a loss of natural vegetation as the site is already cleared. And with regular removal of alien vegetation, the chance of complete take-over is minimal.							
<b>Cumulative Impacts</b>	There may be a cumulative impact as disturbance in the surrounding area has already led to the encroachment of alien vegetation in the area.							

<b>3. Destruction of habitat and loss of animal species.</b>								
	Strathmore 214							
<b>Potential Impact Description:</b>	The site is located on an active mining area and was disturbed prior to the establishment of the Asphalt Plant. Due to this, it is highly unlikely that there are any animals currently on site. However, there is a small copse of woodland adjacent to the site which may contain a few animal species which may be impacted by operational activities.							
<b>Duration of Impact:</b>	During the operational phase							
	Operational phase							
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	2	3	2	2.33	2	5	3.5	8.155
<b>With Mitigation</b>	1	1	1	1	1	5	3	3

<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• If any animals are found on site, they should be relocated.</li> <li>• No open fires will be allowed.</li> <li>• No hunting of animals may take place.</li> <li>• Any activities that may lead to disturbance should be restricted to the operational area.</li> </ul>							
<b>Rehabilitation Phase</b>								
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	No impact							
<b>With Mitigation</b>	No impact							
<b>Mitigation Measures</b>	None							
<b>Can the impact be reversed</b>	Yes. The Asphalt Plant is temporary. The land belongs to the Strathmore Mine and if the mine is decommissioned in the future, the site will most likely be completely rehabilitated and animals may return.							
<b>Will the impact cause irreplaceable loss to resource</b>	No. No animals will be killed. Animals found on site will be relocated.							
<b>Cumulative Impacts</b>	There may be a cumulative impact, as most surrounding areas have been disturbed by mining activities and suitable habitat for animals have been removed.							

<b>Summary of impacts</b>				
	<b>Operational</b>		<b>Rehabilitation</b>	
<b>Potential Impacts</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>



1. Loss of natural occurring vegetation (Legogote Sour Bushveld)	6	2.5	None	None
2. Establishment of invasive alien plant species.	7	4.98	4	2.49
3. Destruction of habitat and loss of animal species.	8.155	3	None	None
<b>Grand Average Total:</b>	7 (Low – Moderate)	3.49 (Low)	4 (Low)	2.49 (Low)
The overall environmental significance indicates that the impact on Vegetation and Animal Life will be LOW during the operational and rehabilitation phases with the correct mitigation.				

The site falls within the Baberton Serpentine Sourveld (SVI 13) vegetation type. This vegetation type can be classified as Vulnerable (VU) (Deacon, 2020). However, the site is located on an active mining area and was cleared of vegetation and disturbed prior to the establishment of the Asphalt Plant. It is highly unlikely that any animals are present on site. However, there is a small copse of woodland adjacent to the site. According to the Ecological and Wetland Assessment, the plants observed in the grove were all common and local species, similar to the area surrounding the mining area. There are no threatened or rare animal or plant species present (Deacon, 2020).

Anticipated impacts of the Asphalt Plant on Vegetation and Animal Life include loss of natural occurring vegetation, establishment of invasive alien species and destruction of habitat and loss of animal species.

The impact of loss of natural occurring vegetation is expected to be LOW-MODERATE during the operational phase without mitigation. Although the site was cleared of vegetation prior to the establishment of the Plant, there is a small copse of woodland located adjacent to the site. It is

imperative that the footprint of the site not be expanded in order to prevent disturbance to the surrounding natural vegetation. With the correct mitigation, the impact can be lowered to LOW.

The impact of establishment of invasive alien plant species is expected to be LOW – MODERATE (7) during the operational phase without mitigation, as the site is significantly disturbed, and invasive species tend to establish in such areas. However, if the correct mitigation measures are implemented, this impact can be reduced to 4.98, which is just outside the LOW threshold. Establishment of alien invasive species is also possible during rehabilitation, as the soil of the site will remain disturbed for some time. However, it is expected that this impact will be LOW if the site is regularly monitored for alien species and these species are removed.

The impact of destruction of habitat and loss of animal species is expected to have a LOW – MODERATE rating during the operational phase, without mitigation. This impact can be reduced to LOW if the correct mitigation measures are followed. It should be noted that the site is located on a mining area therefore it is not expected that many animals, if any, will occur on site.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be cumulative impacts, as the surrounding areas are cleared of natural vegetation and disturbed due to mining activities, which has contributed to the loss of natural occurring vegetation, the establishment of invasive species and the loss of animals in the area.

Proposed mitigation:

- The footprint of the site may not be expanded, and no further clearance of vegetation may take place.
- Establishment of alien vegetation should be monitored and removed on a regular basis during operation and rehabilitation.

- Removal of alien plants must adhere to the Alien and Invasive Species Regulations.
- No hunting will occur of animals that are present.
- If any animals are found on site, they should be relocated.
- No open fires will be allowed.

### Surface Water

The following impacts may occur on the surface water as a result of the operational phase of the activity:

- Contamination of nearby surface water resources through spillage of petrochemical substances.

1. Contamination of nearby surface water resources through spillage of petrochemical substances.								
	Strathmore 214							
<b>Potential Impact Description:</b>	The Asphalt Plant is located approximately 250 m from the Salt Creek, which is dammed by the Strathmore Dam. This dam is classified as a NFEPA Channelled valley-bottom Wetland. However, it is artificial in nature.							
<b>Duration of Impact:</b>	During the operational phase							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	3	3	2	2.66	3	4	3.5	9.31
<b>With Mitigation</b>	2	2	1	1.66	1	4	2.5	4.15
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Vehicles and machinery on site should be serviced regularly to prevent any leaks.</li> <li>• Drip trays should be placed underneath immobile vehicles and machinery.</li> <li>• Any spills of hazardous substances should be cleaned immediately by removing the contaminated soil and disposing of it as hazardous waste.</li> <li>• Potentially hazardous substances will be stored inside a bunded area with an impermeable surface which has the capacity to store more than 110% of the volume of the substance.</li> </ul>							

	<ul style="list-style-type: none"> <li>Appropriate storm water measures such as berms and/or culverts should be maintained around site to prevent clean storm water from entering the site during rainfall events and dirty storm water from leaving the site and entering the natural drainage lines leading to the Strathmore Dam and Salt Creek.</li> </ul>							
<b>Rehabilitation Phase</b>								
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	No impact							
<b>With Mitigation</b>	No impact							
<b>Mitigation Measures</b>	None							
<b>Can the impact be reversed</b>	Yes, the impact can be reversed by implementing the correct clean-up procedures.							
<b>Will the impact cause irreplaceable loss to resource</b>	No.							
<b>Cumulative Impacts</b>	There may be cumulative impacts due to surrounding mining activities causing contamination of the surrounding water resources.							

Summary of impacts				
	Operational		Rehabilitation	
Potential Impacts	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
1. Contamination of nearby surface water resources through spillage of petrochemical substances	9.31	4.15	None	None
<b>Grand Average Total:</b>	9.31 (Low - Moderate)	4.15 (Low)	None	None
The overall environmental significance indicates that the impact on Surface Water will be LOW during the operational phase with the correct mitigation.				

The Asphalt Plant is located approximately 250 m from the Salt Creek, which is dammed by the Strathmore Dam. This dam is classified as a NFEPA Channelled valley-bottom Wetland. However, it is artificial in nature. "During the process of surveying the area for potential impacts, the possibility of a massive spill originating from the Asphalt Plant were considered. Should all safety measures in place fail and the spill discharged into the surrounding area, four different routes of flow were identified. Three of the 4 drainage lines transporting storm water flows from the Plant will not be able to reach the riverine environment. The fourth drainage line is secured by an existing "settling pool", but there is still a slight chance that the spill might breach or overtop the pond wall. However, the pollutants have to flow over 663 m of absorbing soil and diverted by other smaller drainage lines in order to reach the Salt Creek." Therefore, the potential risk to the Salt Creek and Strathmore Dam is considered to be low (Deacon, 2020). **Please refer to the Ecological and Wetland Assessment in Appendix H of the application.**

Anticipated impacts of this development on Surface Water include contamination of nearby surface water resources through spillage of petrochemical substances.

The impact of contamination of nearby surface water resources through spillage of petrochemical substances is expected to have a LOW – MODERATE rating during the operational phase, without mitigation. As described above, there is a slight chance that spills from the Asphalt Plant may enter a drainage line that leads to the Strathmore Dam. However, with the correct mitigation, this impact can be lowered to LOW, as the pollutants have to flow over 663 m to reach that Dam and there is a "settling pool" that secures the drainage line.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be cumulative impacts, as the surrounding mining activities may also lead to contamination of the Strathmore Dam and Salt Creek.

Proposed mitigation:

- Appropriate storm water measures such as berms and/or culverts should be constructed around the site to divert clean storm water around the site during rainfall events and dirty storm water from leaving the site.
- Potentially hazardous substances will be stored inside a bunded area with an impermeable surface which has the capacity to store more than 110% of the volume of the substance.
- Any spills of hazardous substances should be cleaned immediately by removing the contaminated soil and disposing of it as hazardous waste.
- Vehicles and machinery on site should be serviced regularly to prevent any leaks.
- Drip trays should be placed underneath immobile vehicles and machinery

## Groundwater

The following impacts may occur on the groundwater as a result of the operational and rehabilitation phases of the activity:

- Contamination as a result of spillages of hazardous substances.

It should be noted that the site is located on a man-made plateau next to a hill, on a mining area and it is not anticipated that the groundwater table is close to the surface in this area.

1. Contamination as a result of spillages of hazardous substances.								
	Strathmore 214							
<b>Potential Impact Description:</b>	Hazardous substances from vehicles and machinery on site can seep into the groundwater and cause contamination during the operational phase. During operation, hazardous substances such as bitumen, diesel and paraffin are stored in aboveground tanks which may leak and contaminate the groundwater resource.							
<b>Duration of Impact:</b>	During the operational and rehabilitation phases							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	2	3	2	2.33	2	4	3	6.99
<b>With Mitigation</b>	1	1	1	1	1	4	2.5	2.5
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Vehicles and machinery on site should be serviced regularly to prevent any leaks.</li> <li>• Drip trays should be placed underneath immobile vehicles and machinery.</li> <li>• Any spills of hazardous substances should be cleaned immediately by removing the contaminated soil and disposing of it as hazardous waste.</li> <li>• Potentially hazardous substances will be stored inside a bunded area with an impermeable surface which has the capacity to store more than 110% of the volume of the substance.</li> <li>• Storage tanks should be inspected regularly for leaks and if any are detected they should be fixed immediately.</li> </ul>							

	Rehabilitation Phase							
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	2	3	1	2	2	4	3	6
<b>With Mitigation</b>	1	1	1	1	1	4	2.5	2.5
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Vehicles and machinery on site should be serviced regularly to prevent any leaks.</li> <li>• Drip trays should be placed underneath immobile vehicles and machinery.</li> <li>• Any spills of hazardous substances should be cleaned immediately by removing the contaminated soil and disposing of it as hazardous waste.</li> </ul>							
<b>Can the impact be reversed</b>	Yes, the impact can be reversed by limiting the number of spillages and immediate clean-up of any hazardous substances. Any contamination to the aquifer itself as a result of hazardous substances infiltrating into the water can be remedied by natural attenuation if the aquifer isn't contaminated any further.							
<b>Will the impact cause irreplaceable loss to resource</b>	No.							
<b>Cumulative Impacts</b>	There may be a cumulative impact in conjunction with the surrounding land uses which can also contribute to contamination of the groundwater.							



Summary of impacts				
	Operational		Rehabilitation	
Potential Impacts	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
1. Contamination as a result of spillages of hazardous substances.	6.99	2.5	6	2.5
<b>Grand Average Total:</b>	6.99 (Low – Moderate)	2.5 (Low)	6 (Low - Moderate)	2.5 (Low)
The overall environmental significance indicates that the impact on Groundwater will be LOW during the operational and rehabilitation phases with the correct mitigation				

Currently the Asphalt Plant is using water that is transported to site from somewhere else. No groundwater is abstracted for the activity. Due to the location of the site, it is also highly unlikely that the water table is located close to the surface.

Anticipated impacts of this development on Groundwater includes contamination as a result of spillages of hazardous substances.

The impact of contamination as a result of spillages of hazardous substances is expected to be LOW - MODERATE during the operational phase, without mitigation. Although it is not expected that the water table in the area is located close to the surface, the activity includes the storage of a large amount of hazardous substances. Many large vehicles and machinery that can leak are also associated with the Asphalt Plant. With the correct mitigation (such as storing all hazardous substances in a bunded area), this impact can be lowered to LOW. Vehicles and machinery that are used during rehabilitation may also cause spillages which can seep into the aquifer. However, this impact is expected to be LOW with the correct mitigation.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be some cumulative impacts regarding contamination of the aquifer, as the surrounding land uses may also contribute towards possible contamination.

Proposed mitigation:

- Hazardous substances will be stored inside a bunded area with an impermeable surface which has the capacity to store more than 110% of the volume of the substance.
- Vehicles and machinery on site should be serviced regularly to prevent any leaks.
- Drip trays should be placed underneath immobile vehicles and machinery.
- Spillages of hydrocarbons will be prevented by using drip trays and a clean-up procedure will be implemented to clean any hydrocarbon spills as soon as possible.
- Storage tanks will be inspected on a regular basis. If any leaks are detected, they will be fixed immediately.

**Air Quality and Noise**

The following impacts may occur on the air quality and noise levels as a result of the operational and rehabilitation phases of the activity:

- Generation of dust and emissions.
- Generation of noise.

It should be noted that the Asphalt Plant is temporary and will be removed in future. Therefore, any impacts relating to noise, generation of dust and emissions are temporary.

1. Generation of dust and emissions								
	Strathmore 214							
<b>Potential Impact Description:</b>	The Asphalt Plant generates some emissions during operation. However, baghouse filters are used in the Asphalt Plant to capture particulate matter from the process to prevent it from being dispersed into the atmosphere. During operation and rehabilitation, vehicle movement also generates dust.							
<b>Duration of Impact:</b>	During the operational and rehabilitation phases							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	3	3	2	2.66	4	5	4.5	11.97
<b>With Mitigation</b>	1	2	1	1.33	3	5	4	5.32
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Speed limits should be enforced on vehicles on site in order to limit dust generation.</li> <li>• If dust generation proves to become problematic, dust control measures will be investigated (such as water spraying).</li> <li>• Baghouse filters will be implemented in the Asphalt Plant to capture particulate matter from the process to prevent it from being dispersed into the atmosphere. This particulate matter will be recycled into the process.</li> <li>• An air emission monitoring program will be implemented to verify compliance to the air emission standards in terms of the National Environmental Management: Air Quality Act, 2004.</li> </ul> <p><b>There is already a dust monitoring programme in place at the Asphalt Plant.</b></p>							

	Rehabilitation Phase							
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	2	2	2	2	2	4	3	6
<b>With Mitigation</b>	1	1	1	1	1	4	2.5	2.5
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• Speed limits should be enforced on construction vehicles in order to limit dust generation.</li> <li>• If dust generation proves to become problematic, dust control measures will be investigated (such as water spraying).</li> </ul> <p><b>There will be no emissions during rehabilitation, except for normal exhaust fumes and generation of dust from movement of vehicles.</b></p>							
<b>Can the impact be reversed</b>	Yes. The Asphalt Plant is temporary and will be removed in the future.							
<b>Will the impact cause irreplaceable loss to resource</b>	No							
<b>Cumulative Impacts</b>	A cumulative impact can occur as there are surrounding land uses, such as mining activities and agriculture, which can contribute towards dust generation and emissions.							

2. Generation of noise	
	Strathmore 214

<b>Potential Impact Description:</b>	Movement of vehicles may result in some noise. The Asphalt Plant itself also generates some noise. However, the site is not located close to any residential areas.							
<b>Duration of Impact:</b>	During the operational and rehabilitation phases							
	<b>Operational phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	2	1	2	1.66	3	5	4	6.64
<b>With Mitigation</b>	1	1	1	1	3	5	4	4
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>Operational activities will be limited to daytime working hours as far as possible to limit any disturbance to neighbouring landowners.</li> </ul> <p><b>It should be noted that the Asphalt Plant is located on a mining area, far from any residential areas.</b></p>							
	<b>Rehabilitation Phase</b>							
	<b>Severity</b>	<b>Duration</b>	<b>Extent</b>	<b>Consequence</b>	<b>Probability</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Significance</b>
<b>Without Mitigation</b>	1	2	2	1.66	2	4	3	4.98
<b>With Mitigation</b>	1	1	1	1	2	4	3	3
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>Rehabilitation activities will be limited to daytime working hours to limit any disturbance to neighbouring landowners.</li> </ul> <p><b>It should be noted that the only noise that will be generated during the rehabilitation phase will be noise associated with heavy vehicle movement and machinery use. It will be temporary in nature.</b></p>							

<b>Can the impact be reversed</b>	Yes. The Asphalt Plant is temporary and will be removed in the future.
<b>Will impact cause irreplaceable loss to resource</b>	No
<b>Cumulative Impacts</b>	There may be some cumulative impacts as there are surrounding activities, such as mining activities that also contribute to noise.

Summary of impacts				
	Operational		Rehabilitation	
Potential Impacts	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
1. Generation of dust and emissions.	11.97	5.32	6	2.5
2. Generation of noise.	6.64	4	4.98	3
<b>Grand Average Total:</b>	9.3 (Low - Moderate)	4.66 (Low)	5.49 (Low - Moderate)	2.75 (Low)
The overall environmental significance indicates that the impact on Air Quality and Noise will be LOW during the operational phase and the rehabilitation phase with the correct mitigation.				

Key emissions generated during operation of the Asphalt Plant include NO<sub>x</sub>, SO<sub>2</sub>, CO, Volatile Organic Compounds (VOCs) and particulate matter. The main sources of emissions are the dryer, hot bins and mixer, but other sources also exist including the storage silos, truck loading and offloading areas, liquid storage tanks, oil heaters and yard emissions. However, baghouse filters (Nomex bags with a total filtering area of 530m<sup>2</sup>) are used in the Asphalt Plant to capture particulate matter from the process to prevent it from being dispersed into the atmosphere. During operation the Plant also generates some noise. Movement of heavy vehicles on site also generate dust. During the rehabilitation phase, some dust and noise will be generated by machinery and the movement of heavy vehicles.

According to the Atmospheric Impact Report, "The impact of modelled dustfall and ambient concentrations of PM<sub>2.5</sub>, SO<sub>2</sub>, CO and BTEX are well below the respective national dust regulations and health-based ambient air quality standards and guidelines. No exceedance of the respective standards or guidelines are predicted within the site or in areas around the site." (uMoya-NILU Consulting, 2020).

Anticipated impacts of this development on Air Quality and Noise will include generation of dust and emissions and generation of noise.

The impact of generation of dust and emissions is expected to be MODERATE during the operational phase without mitigation, as the Plant releases some emissions into the atmosphere. Movement of heavy vehicles on site which generate dust also take place often. This impact can be lowered to LOW-MODERATE with the correct mitigation. It should be noted that there are baghouse filters implemented in the Asphalt Plant and a dust monitoring programme is being implemented on site. During the rehabilitation phase, the impact is expected to be LOW-MODERATE without mitigation, as vehicles and machinery used during rehabilitation may generate some dust. However, this can be lowered to LOW with the correct mitigation measures.

The impact of generation of noise is expected to be LOW-MODERATE during the operational phase without mitigation. The Plant itself does generate some noise and noise is also generated by heavy vehicle movement on site. However, the site is not located close to town. The only sensitive receptors in the area is a homestead located on the mining property belonging to the landowner. With the correct mitigation this impact can be slightly lowered, but it will still remain LOW-MODERATE. During the rehabilitation phase, the impact is expected to be just outside the LOW rating (4.98) without mitigation. With the correct mitigation this can be reduced to LOW, as the only noise generated during the rehabilitation phase will be noise associated with vehicle movement and machinery use.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be some cumulative impacts regarding generation of dust and emissions, as there are some surrounding land uses that may also lead to emissions and dust, such as mining activities, agricultural activities, vehicles and other industries in the area. There may also be a cumulative impact on noise, as the surrounding activities, such as traffic may also contribute towards noise.

Proposed mitigation:



- Speed limits should be enforced on vehicles on site in order to limit dust generation.
- If dust generation proves to become problematic, dust control measures will be investigated (such as water spraying).
- Baghouse filters will be implemented in the Asphalt Plant to capture particulate matter from the process to prevent it from being dispersed into the atmosphere. This particulate matter will be recycled into the process.
- An air emission monitoring program will be implemented to verify compliance to the air emission standards in terms of the National Environmental Management: Air Quality Act, 2004.
- Dust Fallout Monitoring is already implemented on site.
- Operational activities will be limited to daytime working hours as far as possible to limit any disturbance to neighbouring landowners.

### Archaeological, Palaeontological and Cultural Resources

The following impacts may occur on the archaeological, palaeontological and cultural resources as a result of the operational and rehabilitation phases of the activity:

- There may be accidental unearthing, damage and/or loss of heritage and/or palaeontological resources as a result of operational and/or rehabilitation activities.

It should be noted that this is not expected to happen, as no heritage and/or palaeontological resources of significant value were observed.

<b>1. Loss of culturally/paleontological significant resources</b>	
	Strathmore 214
<b>Potential Impact Description:</b>	Operational activities may lead to the accidental unearthing, damage and/or loss of heritage artefacts/objects or paleontological resources. However, this is not likely, as no excavation activities take place during operation. During rehabilitation, there may be a slight chance of accidental unearthing, damage and/or loss. However, no heritage and/or palaeontological resources of significant value were observed on site.
<b>Duration of Impact:</b>	During the operational and rehabilitation phases

Operational phase								
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	2	2	1	1.66	2	5	3.5	5.81
<b>With Mitigation</b>	1	1	1	1	1	5	3	3
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• If any significant heritage or paleontological resources are discovered during operation, work must stop immediately, and a specialist must be contacted.</li> <li>• SAHRA will also be notified should traces of any palaeontological/archaeological heritage be found during operation.</li> </ul> <p><b>It should be noted that this is highly unlikely, as no excavation activities take place during operation and no culturally important structures and/or objects have been observed on site.</b></p>							
Rehabilitation Phase								
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	2	2	1	1.66	2	4	3	4.98
<b>With Mitigation</b>	1	1	1	1	1	4	2.5	2.5
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• If any significant heritage or paleontological resources are discovered during rehabilitation, work must stop immediately, and a specialist must be contacted.</li> <li>• SAHRA will also be notified should traces of any palaeontological/archaeological heritage be found during rehabilitation.</li> </ul>							
<b>Can the impact be reversed</b>	No. Once an artefact has been unearthed or damaged it cannot be replaced. However, it is not anticipated that this will happen.							

<b>Will the impact cause irreplaceable loss to resource</b>	If any heritage of paleontological resources is damaged, then yes. However, this is highly unlikely.
<b>Cumulative Impacts</b>	None

Summary of impacts				
	Operational		Rehabilitation	
Potential Impacts	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
1. Loss of culturally/paleontologically significant resources	5.81	3	4.98	2.5
<b>Grand Average Total:</b>	5.81 (Low-Moderate)	3 (Low)	4.98 (Low-Moderate)	2.5 (Low)
The overall environmental significance indicates that the impact on Archaeological, Palaeontological and Cultural Resources will be LOW during the operational and rehabilitation phase with the correct mitigation.				

According to the Heritage Impact Exemption letter (van der Walt, 2020), the study area is of low heritage significance and has been impacted upon by the Magnesite Mine since the 1960's. Mining activities would have obliterated any indicators of heritage resources if any occurred in the study area. Therefore, it is unlikely that the Asphalt Plant impacted on any sites of significance. According to the Paleontological Impact Exemption letter, the site is also paleontologically insignificant. The site is on ancient volcanic rocks, the Kaap Valley Granite, with the Tjakstad Subgroup (Onverwacht Group, Barberton Greenstone Belt). Neither of these rock types is fossiliferous because they are much too old and of the wrong type to preserve fossils (Bamford, 2020). Therefore, there is no chance of finding any fossils in the Asphalt Plant site or immediate surroundings.

Anticipated impacts of this development on Archaeological, Palaeontological and Cultural Resources include the loss of culturally/paleontologically significant resources.

The impact of loss of culturally significant resources is expected to be on the lower side of the LOW-MODERATE rating during both the operational and rehabilitation phases without mitigation, as there could still be a slight chance of unearthing heritage and/or palaeontological resources. However, the impact can be lowered to LOW with the correct mitigation.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

It is not expected that there will be any cumulative impacts.

Proposed mitigation:

- If any significant heritage or paleontological resources are discovered during operation or rehabilitation, work must stop immediately, and a specialist must be contacted.
- SAHRA will also be notified should traces of any palaeontological/archaeological heritage be found during operation or rehabilitation.

**Aesthetics**

The following impacts may occur on the aesthetics as a result of the operational phase of the activity:

- Negative aesthetic impact due to operational activities.

<b>1. Negative aesthetic impact</b>	
	Strathmore 214
<b>Potential Impact Description:</b>	Due to the site being completely cleared of natural vegetation and due to the industrial look of the Asphalt Plant, there may be a negative aesthetic impact. Littering may also potentially take place. However, the site is located on a mining area, far from any residential areas or public roads.
<b>Duration of Impact:</b>	During the operational phase
<b>Operational phase</b>	

	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	1	3	1	1.66	1	4	2.5	4.15
<b>With Mitigation</b>	1	3	1	1.66	1	4	2.5	4.15
<b>Mitigation Measures</b>	<ul style="list-style-type: none"> <li>• The site will always be kept clean and neat by correct housekeeping and waste disposal.</li> <li>• Any spills and/or leakages should be cleaned immediately in the correct manner.</li> </ul> <p><b>It should be noted that the Asphalt Plant is located on a mining area, far from any residential areas and public roads.</b></p>							
<b>Rehabilitation Phase</b>								
	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
<b>Without Mitigation</b>	No impact							
<b>With Mitigation</b>	No impact							
<b>Mitigation Measures</b>	None.							
<b>Can the impact be reversed</b>	Yes. The Asphalt Plant is temporary.							
<b>Will the impact cause irreplaceable loss to resource</b>	No							
<b>Cumulative Impacts</b>	There may be a cumulative impact, as there are surrounding land uses that also contribute to negative aesthetics, such as mining activities.							

Summary of impacts				
	Operational		Rehabilitation	
Potential Impacts	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
1. Negative aesthetic impact	4.15	4.15	None	None
<b>Grand Average Total:</b>	4.15 (Low)	4.15 (Low)	None	None
The overall environmental significance indicates that the impact on Aesthetics will be LOW during the operational phase with the correct mitigation.				

Although the site is completely cleared of natural vegetation and the site is disturbed, which may cause an aesthetic impact, the site is located on an active mining area, far from any residential areas or public roads. Furthermore, the Asphalt Plant is only temporary and will be removed in the future.

The negative aesthetic impact is expected to be LOW during the operational phase with and without mitigation, as the site is not near any sensitive receptors in terms of aesthetics, such as residential areas or public roads. The site is also located on a mining area.

There is no feasible design/layout alternative for this project. The applicant has extensive knowledge and experience in the operation of the Asphalt Plant and the layout of the site is usually designed in a manner to allow the most efficient and safest way of operation, storage of goods and transportation of material to and product from the plant.

Also, as mentioned earlier, there is no feasible technological alternative because as far reasonably possible, the best technology will be utilised to limit and / or prevent impact on the environment.

There may be a cumulative impact on aesthetics, as there are other land uses such as mining activities that also contribute to negative aesthetics.

Proposed mitigation:

- The footprint of the operational area may not be increased.
- The site will always be kept clean and neat by correct housekeeping and waste disposal.
- Any spills and/or leakages should be cleaned immediately in the correct manner.

### **Demographics and Regional Socio-economic Structure**

The Asphalt Plant has provided at least 6 local people with jobs for the duration of the project. This has a positive impact on the unemployment rate of the local municipality. In turn, this will also reduce the poverty rate and give 6 families the means to send their children to school. Therefore, this development has a positive impact on the Demographics and Regional Socio-economic Structure.



### **3. Conclusion**

From the Impact Assessment it can be concluded that there are no impacts that are expected to have a HIGH or unacceptable rating. The most significant impacts associated with the Asphalt Plant include the impacts on Air Quality and Noise. However, as mentioned, the Asphalt Plant is temporary and it is also located on a mining area.