

## PROJECT IMPACT ASSESSMENT, SIGNIFICANCE AND MITIGATION MEASURES SUMMARY

The following impact rating approach used by EnviroAfrica CC is a basic exponential rating system to assess actual and potential negative and positive environmental impacts.

Environmental activities or aspects are identified, based on:

- the phases of the project,
- the nature (or description) of the actual and potential impacts of the activities.

For every project activity or aspect, various environmental impacts are listed. Every negative impact is allocated a -value as per each of the following criteria:

- Probability (Likelihood)
- Extent
- Duration (Frequency)
- Consequence (Receiving Environment)
- Magnitude (Intensity/severity)

Every positive impact is allocated a +value as per each of the following criteria:

- Probability (Likelihood)
- Extent
- Duration (Frequency)
- Magnitude (Intensity/severity)

Once a value is allocated for each of the criterion, the scores are averaged to determine the final impact rating see Table 1 below.

EnviroAfrica then further assesses environmental significance, based on the nature of the impact, as per the score and colour key which forms part of Table 1 below. This results in impacts having either a low (indicated in green), medium (indicated in yellow) or high (indicated in orange and red) negative significance, and a low (light blue), medium (blue) or a high (dark blue) positive significance

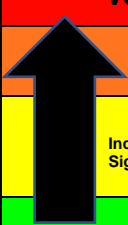
**Note:** i. As a baseline, impact rating values/scores are allocated taking the **worst-case** scenario into account i.e. with no mitigation. The baseline rating is compared with those after mitigation has been taken into account i.e. the post-mitigation rating. Post mitigation rating is used for the actual impact assessment.

<b>SIGNIFICANCE CRITERIA</b>	<b>Very High</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Negligible (very-low)</b>
<b>Value</b>	<b>16</b>	<b>8</b>	<b>4</b>	<b>2</b>	<b>1</b>
<b>Probability (likelihood) (P)</b>	Definite. Impact will definitely occur (impact will occur regardless of any prevention measures)	Highly probable. Very likely for impact to occur.	Probable. Impact may likely occur.	Improbable. Impact may occur. Distinct Possibility	Improbable. Low likelihood/unlikely for impact to occur.
<b>Extent (E)</b>	Impact potentially reaches beyond national boundaries	Impact has definite provincial/potential national consequences	Impact confined to regional area/ town	Impact confined to local region and impact on neighbouring properties	Impact confined to project property / site
<b>Duration (D)</b>	Permanent The impact is expected to have a permanent impact, with very little to no rehabilitation possible	Long-Term The impact is expected to last for a long time after construction with rehabilitation expected to be 15-50 years. Impact is reversible but only with long-term mitigation	Medium-term The impact is expected to last for some time after construction with rehabilitation expected to be 5 - 15 years. Impact is reversible but only with on-going mitigation	Short-term The impact is expected to last for a relatively short time with rehabilitation expected to be 2-5 years. The impact is reversible through natural process and/or some mitigation.	Very short/ temporary The impact is expected to be temporary and last for a very short time with rehabilitation expected to be less than 2 years. The impact is easily reversible through natural process and/or some mitigation.
<b>Magnitude (Intensity/ Severity) (M)</b>	It is expected that the activity will have a very severe to permanent impact on the surrounding environment. Functioning irreversibly impaired. Rehabilitation often impossible or unfeasible	It is expected that the activity will have a severe impact on the surrounding environment. Functioning may be severely impaired and may be temporarily cease. Rehabilitation will be needed to restore system integrity	It is expected that the activity will have an impact on the surrounding environment, but it will maintain its function, even if moderately modified (overall integrity not compromised). Rehabilitation easily achieved	It is expected that the activity will have a perceptible impact on the surrounding environment, but it will maintain its function, even if slightly modified (overall integrity not compromised). Rehabilitation easily achieved	It is expected that the impact will have little or no effect on the integrity of the surrounding environment
<b>Receiving environment (Consequence): (RE)</b>	Very sensitive, pristine area – protected site or species permanently or seasonally present	Unused area containing only indigenous fauna / flora species	Unused area containing indigenous and alien fauna / flora species	Semi-disturbed area already rehabilitated / recovered from prior impact, or with moderate alien vegetation	Disturbed area/ transformed/ heavy alien vegetation

**ENVIRONMENTAL RATING SIGNIFICANCE KEY:**

**Negative Impacts**


SIGNIFICANCE	RATING	Final rating score / value range
Very Significant	Very High	-11 to -16
Significant	High	-7 to <-11
Insignificant	Medium	-4 to <-7
	Low	-2 to <-4
	Very Low	-1 to <-2



Increasing Significance

**Positive Impacts**

SIGNIFICANCE	RATING	Final rating score / value range
Significant	High	10 to 16
Insignificant	Medium	4 to <10
	Low	1 to <4



Increasing Significance

**Table 1: Environmental Significance Rating Methodology (rating criteria and significance key)**

*\*PLEASE SEE RATING SCORING MATRIX*

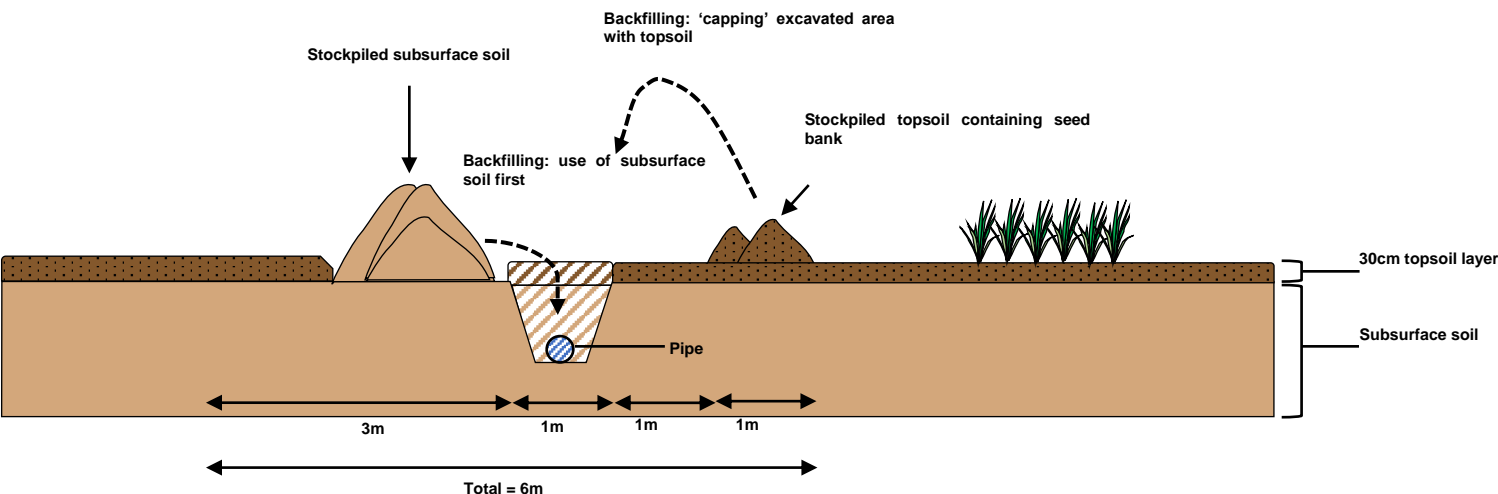
Nature of Impact			Impact Assessment Ranking and Proposed Mitigation		
No.	Aspect	Impact	Environmental Significance (without Mitigation)	Proposed Mitigation (i.e. Proposed mitigation to reverse/ avoid, manage or mitigate identified impacts associated with construction, operation, and decommissioning/ closure phases)	Environmental Significance (After Mitigation)
<b>CONSTRUCTION PHASE</b>					
1	Botanical	<b>Geology &amp; soils:</b> Potential impact on special habitats	-4	<ul style="list-style-type: none"> <li>All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report.</li> <li>A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies.</li> <li>Before any work is done protected tree species must be marked and demarcated. If any of these species are to be removed, the appropriate permits approvals must first be obtained.</li> <li>Lay-down areas or construction sites must be located within the construction footprint.</li> <li>No clearing of any area outside of the construction footprint may be allowed.</li> <li>All waste that had been illegally dumped within the footprint must be removed to a Municipal approved waste disposal site.</li> <li>An integrated waste management approach must be implemented during construction.</li> <li>Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.</li> <li>Alien invasive Prosopis plants within the footprint (and immediate surroundings) must be removed in a responsible way (to ensure against regrowth).</li> <li>The Municipality must ensure that adequate waste and sewerage facilities and or services are established to service this community.</li> </ul>	-3
2		<b>Land-use and cover:</b> Potential impact on socio-economic activities.	-4		-3
3		<b>Vegetation status:</b> Loss of Least Threatened vegetation and associated habitat.	-4		-3
4		<b>Conservation priority:</b> Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	-7		-3
5		<b>Connectivity:</b> Potential loss of ecological migration corridors.	-4		-3
6		<b>Protected &amp; endangered plant species:</b> Potential impact on threatened or protected plant species.	-4		-3

APPENDIX 7 – IMPACT ASSESSMENT  
BLAAUWSKOP HOUSING DEVELOPMENT



Nature of Impact			Impact Assessment Ranking and Proposed Mitigation		
No.	Aspect	Impact	Environmental Significance (without Mitigation)	Proposed Mitigation (i.e. Proposed mitigation to reverse/ avoid, manage or mitigate identified impacts associated with construction, operation, and decommissioning/ closure phases)	Environmental Significance (After Mitigation)
7		<b>Invasive alien plant species:</b> Potential invasive plant infestation as a result of the activities.	-4		-3
8		<b>Veld fire risk:</b> Potential risk of veld fires as a result of the activities.	-2		-2
9		<b>Cumulative impacts:</b> Cumulative impact associated with proposed activity.	-4		-3
10		<b>The "No-Go" option:</b> Potential impact associated with the No-Go alternative.	-4		0
11	Heritage	Five traces of lithic occurrences across the development footprint.	-3	<ul style="list-style-type: none"> <li>The lithic traces of low significance: The lithic traces on the landscape of the study area are of low significance and the impact of the development on these resources are inconsequential. No other heritage was identified. Therefore, no further mitigation is required, and from a heritage point of view we recommend that the proposed development can continue.</li> <li>It must be noted that although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be</li> </ul>	-2
12		No graveyards present within the proposed site for development	-3		-2

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				<p>alerted as per section 35(3) of the NHRA. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.</p>	
13	Palaeontology	<p>Due to the zero palaeontological significance of the area, no further palaeontological heritage studies, ground-truthing and/or specialist mitigation are required.</p>	-2	<p><b>Site has a zero palaeontological significance:</b> no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required. It is considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area as the igneous rocks underlying the site are not fossiliferous. It is therefore recommended that the project be exempt from a full Paleontological Impact Assessment (Butler 2018).</p>	-2
14	Freshwater	<p><b>Impact on Freshwater Resources</b> – Construction phase. Destruction of drainage lines</p>	-6	<p>The following mitigation measures, as per the Freshwater Impact Assessment (<b>Appendix 6C</b>) must be implemented. These measures include (i) construction taking place during the dry season, limiting the construction footprint, maintaining an adequate buffer zone, connecting drainage lines to stormwater infrastructure over the irrigation canal, and (ii) the implementation of a waste management plan relative to proper municipal litter and urban waste collection and removal systems and the installation of an adequate wastewater treatment facility and associated infrastructure.</p>	-2
15		<p><b>Operational phase. Litter and sewage into the drainage lines and Orange River.</b></p>	-6		-3

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	Exposed platforms and trenches excavated for any pipeline are susceptible to erosion during the construction phase.  Erosion and safety hazards associated with excavated pipelines which are not backfilled.		-6	<p>The following mitigation measures must be implemented for any excavated trenches:</p> <ul style="list-style-type: none"> <li>- Excavated material must be separated into topsoil (generally upper 30cm) and subsoil (remaining) and stockpiled accordingly. Stockpiles must be located at least 32m away from any drainage line or other sensitive area (see figure below);</li> <li>- Trenches must be excavated in sections and backfilled once the pipeline has been laid. The excavated trench must not remain open indefinitely;</li> <li>- Any pooled water in open trenches must be pumped out.</li> <li>- Trenches must be demarcated;</li> <li>- Material must be backfilled in the order it was excavated (i.e. backfilled first with subsoil followed by topsoil). Backfilled trenches must be rehabilitated.</li> </ul>	-3
 <p>The diagram illustrates the backfilling process for a trench containing a pipe. It shows a cross-section of the ground with a trench 6m wide. The trench is divided into sections: a 3m section for stockpiling subsurface soil, a 1m section for backfilling with subsurface soil first, a 1m section for backfilling with topsoil, and a 1m section for stockpiling topsoil containing a seed bank. The final backfilling step is 'capping' the excavated area with topsoil. The diagram also shows a 30cm topsoil layer and subsurface soil layers.</p>					



**APPENDIX 7 – IMPACT ASSESSMENT  
BLAAUWSKOP HOUSING DEVELOPMENT**



Nature of Impact			Impact Assessment Ranking and Proposed Mitigation		
No.	Aspect	Impact	Environmental Significance (without Mitigation)	Proposed Mitigation (i.e. Proposed mitigation to reverse/ avoid, manage or mitigate identified impacts associated with construction, operation, and decommissioning/ closure phases)	Environmental Significance (After Mitigation)
16	Socio-economic	Creation of short-term employment opportunities during the construction phase.	4	The construction of Blaauwskop Housing Project will create employment and skills development opportunities during the construction phase. This will upskill local community members and lowering the high unemployment rate within the !Kai !Garib Local Municipality and more specifically, the Blaauwskop Township.	4
17	Dust	Dust will be generated during the construction of the proposed development which may impact drivers and commuters.	-4	The proposed site for development is located approximately 300m north of the N14 and adjacent to the existing Blaauwskop Settlement. Although the generation of dust will be temporary, the following mitigation measures must be implemented: <ul style="list-style-type: none"> <li>- Vehicle speed must be limited to 20km/h to reduce the amount of dust generated along the gravel roads (and especially in 20m of the drainage line which must be treated as an environmental sensitive area.</li> <li>- All material, being transported in the back of trucks, must be covered.</li> <li>- Should the mitigation measures be inadequate, water carts must be used on site along the access roads.</li> <li>- The applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regards to dust levels produced on site.</li> </ul>	-3
18	Visual	Site may be not aesthetic amid natural background.	-4	The proposed development may be visible from the N14 however, the proposed nature of the development will be in line with surrounding land use, namely the existing Blaauwskop Development.	-3
19	Noise	Noise will be generated during the construction phase.	-4	Any noise generated by construction activities will be a temporary impact however, the following mitigation measures will be implemented: <ul style="list-style-type: none"> <li>- A complaints register must be maintained on-site. Any complaints received must be responded to and rectified accordingly.</li> <li>- The ECO must be notified of any complaints;</li> <li>- All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors.</li> </ul>	-3

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				- Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00).	
20	Unsustainable sourcing of raw materials	Illegal sourcing of raw materials, such as gravel, sand, water etc. promoting illegal mining operations causing significant damage to the environment.	-8	This impact can be fully mitigated. The following mitigation measures must be implemented: - Contractors must obtain and provide proof of sustainable sourcing of materials brought to, and used on, site. These receipts must be retained on site. - The volume of material (e.g. gravel, sand, etc.) must be recorded. These records must be kept on site.	-4
<b>OPERATION PHASE</b>					
21	Water supply	Increased pressure on water source for water supply	-6	Refer to Civils Services Report (Appendix 4B) for more information ofn proposed services. The following mitigation measures must be implemented: - All water pipelines, pumps, and associated equipment must be routinely checked and monitored for leakages/ malfunction. Any leakages or malfunctioning equipment must be immediately fixed/ rectified; - No hazardous substances/ dangerous goods are to be used/ stored in close proximity to water storage areas. Any contaminated water must be disposed of as hazardous waste at a registered hazardous waste disposal facility. A waste receipt is required as proof of safe disposal; and - Any equipment utilized must be placed on a hardened surface (e.g. concrete surface or batching board) to prevent the contamination of exposed soil.	-4
22	Sewage management	Increased production of sewage which requires effective management	-7		-4
23	Solid waste management	Increased pressure on municipal waste removal services and	-7	Portions of the site has been heavily invaded by the alien invasive <i>Prosopis</i> tree. Although these alien trees will be removed during the construction phase, alien invasive plant species present on site must be managed.	-4

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		illegal dumping of waste		<p>The following mitigation measures must be implemented:</p> <ul style="list-style-type: none"> <li>- The construction area must be kept free of alien invasive plants. Regular inspections of the site must take place. The following methods of alien plant control can be adapted:</li> <li>- Physical control – which includes pulling alien plants out by hand, using hand tools, and/ or mechanised tools, as well as ringbarking/ girdling;</li> <li>- To reduce alien plant encroachment, construction areas must be rehabilitated as soon as practically possible after the completion of construction activities.</li> <li>- The area previously disturbed by construction activities must be regularly inspected following rehabilitation where any alien invasive plant species must be removed.</li> </ul>	
<b>DECOMMISSIONING AND CLOSURE PHASE</b>					
24	Waste	Demolition of infrastructure resulting in waste accumulation on-site and surrounding area.	-7	<p>The following mitigation measures must be implemented:</p> <ul style="list-style-type: none"> <li>- All infrastructure which has been demolished must be consolidated, removed, and disposed of at a registered disposal facility. Waste receipts are required as proof of safe disposal;</li> <li>- The burying and/or burning of waste is strictly prohibited.</li> </ul>	-3
25	Soil and water sources	Exposed soil becoming prone to erosion resulting in the sedimentation of the drainage line.	-6	<p>The following mitigation measures must be implemented:</p> <ul style="list-style-type: none"> <li>- Previously transformed areas must be ripped and subsequently rehabilitated with indigenous vegetation characteristic of the Bushmanland Arid Grassland (LT). Previously implemented erosion mitigation measures must remain in place.</li> </ul>	-3