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.

APPENDIX F – IMPACT ASSESSMENT

SIGNIFICANCE CRITIERIA	Very High	High	Medium	Low	Negligible (very low)
Value	**16**	**8**	**4**	**2**	**1**
Probability (likelihood) **(P)**		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. Low likelihood/unlikely for impact to occur.
Extent (E)	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
Duration (D)		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 2 - 15 years. Impact is reversible but only with on-going mitigation	Short-term / temporary The impact is expected to be temporary or last for a relatively short time with rehabilitation expected to be <2years. The impact is reversible through natural process and/or some mitigation.
Magnitude (Intensity/ Severity) **(M)**	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
Receiving environment (Consequence): **(RE)**	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
Increasing Significance	Medium	-4 to <-7
Insignificant	Low	-2 to <-4
	Very Low	-1 to <-2

Positive Impacts

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

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

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)**
CONSTRUCTION PHASE					
1	Biodiversity	Potential impact on special habitats (e.g. true quartz or "heuweltjies")	Very Low (Negative)	No special habitats observed, apart from two rocky hills, which will not be impacted by the proposed development.	Very Low (Negative)
2		Loss of vulnerable or endangered vegetation and associated habitat.	Low (Negative)	- All construction should be done in accordance with an approved construction phase Environmental Management Plan (EMP) approved by the Northern Cape Department of Environmental Affairs. - A suitably qualified Environmental Control Officer should be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies. - Before any work is done the footprint must be clearly demarcated. The demarcation must aim at minimising impacts outside of the approved development footprint. - The "Search & Rescue" recommendations as per given in Table 10 in the Terrestrial Biodiversity Impact Report (Appendix D1) must be implemented: o A botanist or a suitably qualified ECO must inspect the demarcated routes for plants SoCC that needs to be searched & rescued . o Search & Rescue must include an aftercare period, during which the plants are watered from time to time to give them the best possible chance of survival. o In addition, all efforts should be made to protect all mature indigenous trees (e.g., Pappea capensis individuals). o Northern Cape Nature Conservation Act permit must be obtained for the potential impacts on the NCNCA protected species. o In addition, a NEM:BA permit must be obtained, should any of the Hoodia gordonii individuals had to be re-planted. - All alien invasive species within the footprint and its immediate surroundings must be removed responsibly. o Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of these species due to incorrect eradication methods);	Low (Negative)
3		Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism. The vegetation itself is not vulnerable or endangered and the site degraded	Low (Negative)		Low (Negative)
4		Potential loss of ecological migration corridors.	Low (Negative)		Low (Negative)
5		Potential impact on threatened or protected plant species.	Low (Negative)		Very Low (Negative)
6		Potential impact on mammals, reptiles, amphibians	Very Low (Negative)		Very Low (Negative)
7		Potential impact on AviFauna Site overlaps with the known distribution range of Neotis ludwigii (Ludwig's Bustard), due to site location within urban edge no significant impact on breeding or feeding patterns is likely.	Very Low (Negative)		Very Low (Negative)
8		Cumulative impact associated with proposed activity.	Low (Negative)		Low (Negative)

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				○ Care must be taken to dispose of alien plant material responsibly. - An integrated waste management approach must be implemented during construction and all waste within the footprint area must be removed and disposed to the local Municipal waste disposal site. - Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.	
9	Freshwater Resources	Freshwater impact from levelling the ground, digging of trenches for foundations, construction of the new WWTW and cleaning up after construction	Low (Negative)	- Preserve drainage lines as much as possible and prevent litter and rubbish from entering them - Preserve buffer zones as much as possible - Prevent loose soil and sediments from moving down the drainage line along with storm water	Very Low (Negative)
10	Heritage	Potential impact on Middle Stone Age (MSA) lithic scatters	Low (Negative)	No mitigation is recommended, but please refer to the EMP in the unlikely event that any heritage resources are found.	Low (Negative)
11		Potential impact on Graves	High (Negative)	A 30m Cautionary Safety/No-Go Buffer Zone should be imposed upon a possible unconfirmed grave, recorded (KSS/1654/007) as well as a cemetery (KSS/1468/008).	Low (Negative)
12		Cumulative impact associated with proposed activity.	Low (Negative)	Cumulatively, there will not be a drastic loss to heritage resources for the region if mitigation measures are adhered to. The heritage resources recorded during the assessment add minimal understanding of the wider archaeological, historical, and cultural landscape, even though they are site-specific.	Low (Positive)
13	Palaeontology	No impacts expected	Unlikely	The following recommendations pertain to the palaeontological significance of the site: - Training of accountable supervisory personnel by a qualified palaeontologist in the recognition of fossil heritage is necessary. - If Palaeontological Heritage is uncovered during surface clearing and excavations, the Chance Find Protocol attached should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site	Unlikely

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				manager must report to South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out. - Before any fossil material can be collected from the development site, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). - These recommendations should be incorporated into the Environmental Management Plan for the proposed development. -	
14	Agriculture	No loss of potential cropland and minimal loss of future agricultural production potential.	Low (Negative)	As per agricultural statement, it is the specialist opinion that the development will not interfere with agricultural activities	Low (Negative)
15	Visual	Site may not be aesthetic amid natural background.	Low (Negative)	This impact cannot be avoided. Mitigation measures as per the EMP.	Low (Negative)
16	Socio-economic	Creation of short- and long term employment opportunities.	Low (Positive)	The construction of the WWTW will have positive impacts on the socio-economic dynamics relative to direct and indirect, short- and long-term employment opportunities and skills development.	Low (Positive)
17	Traffic	Increase in trucks and other construction vehicles.	Low (Negative)	Given the location of the site, it is likely that construction traffic will impact road users however the following mitigation measures will be implemented: - The site must be made easily accessible to all construction traffic travelling along main routes; - - If required, point's men must be in attendance to direct traffic when heavy vehicles are accessing or leaving the site to ensure that there are no accidents.	Low (Negative)
18	Noise	Noise will be generated during the construction phase.	Low (Negative)	- Any noise generated by construction activities will be a temporary impact however, the following mitigation measures will be implemented: - A complaint register to be maintained on-site. Any complaints received must be responded to and rectified accordingly. The ECO must be notified of any complaints.	Very Low (Negative)

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				- All construction vehicles must be fitted with standard silencers. All silencers must be maintained. All machinery used on site must have suppressors. - Working hours must be limited to and strictly adhered to standard daylight working hours (08h00-17h00).	
19	Dust	Dust will be generated during the construction of the proposed development.	Low (Negative)	The following mitigation measures must be implemented: - Stockpiled material must be covered with a plastic sheet, tarp or similar in windy conditions; - A water cart must be used on utilized roads to reduce construction related dust generation; - Sprinklers may need to be installed to reduce the generation of dust by construction activities.	Very Low (Negative)

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OPERATIONAL PHASE					
20	Freshwater	Untreated sewage ending up in the aquatic environment Treated effluent into the aquatic environment Leaky pipes and conduits	Medium (Negative)	- Establish containment capacity for mishaps and spills - Maintain the WWTWs and pipelines - Monitor effluent quality. - Make analytical results public - Keep surrounding environment tidy	Low (Negative)
21	Visual	Visual impact minimal for low-lying infrastructure outside the urban edge of surrounding landscape	Low (Negative)	This impact cannot be avoided. Mitigation measures as per the EMP.	Low (Negative)
22	Socio-economic	Increase employment opportunities	Low (Positive)	The construction of the WWTW will have positive impacts on the socio-economic dynamics relative to direct and indirect, short- and long-term employment opportunities and skills development.	Low (Positive)
23		Enhanced supply of bulk services	Medium (Positive)	The proposed development would increase the capacity of municipal services, allowing it to treat the effluent sufficiently to comply with the DWA General Limits. It would also assist in ending the current sewage pollution in Kakamas and thus helping upkeep the constitutional right to environment.	Medium (Positive)
24	Smell	Increased smell	Low (Negative)	Obnoxious odours commonly caused from Hydrogen Sulphide gas from conventional Oxidation Pond systems, like the WWTW proposed at Kakamas is not likely to be an issue due to the placement, more than 500m from residential areas. - Maintain WWTWs and pipeline	Low (Negative)