

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)					
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility					
CONSTRUCTION PHASE																				
Atmospheric Emissions	Negative	Dust emissions	Sewer Proposal	Yes	Direct	Site	Short-term	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> A speed limit of 20km/h must be maintained on all dirt roads. Dust suppression by means of either water or biodegradable chemical agent is required. 	High	Low	No Loss	Reversible				
			Sewer Alternative 1			Site	Short-term	Low-Medium	Likely	Low	High		High	Low	No Loss	Reversible				
			Layout Proposal			Site	Short-term	Low-Medium	Likely	Low	High		High	Low	No Loss	Reversible				
			Layout Alternative			Site	Short-term	Low-Medium	Likely	Low	High		High	Low	No Loss	Reversible				
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Emissions from vehicles and equipment (CO ₂ , NO _x , SO _x , VOC's etc.)		Sewer Proposal	Yes	Direct	Local	Short-term	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> In terms of transportation of workers and materials, collective transportation arrangements should be made to reduce individual car journeys where possible. All vehicles used during the project should be properly maintained and in good working order. All vehicles and other machinery should comply with road worthy requirements and comply with legislation in terms of allowable emissions. 	Medium	Low	No Loss	Reversible			
				Sewer Alternative 1			Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible			
				Layout Proposal			Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible			
				Layout Alternative			Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible			
				No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable
	Negative	Noise		Sewer Proposal	No	Direct	Neighbouring	Short-term	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. Construction activities should be limited to daytime only. 	High	Low	No Loss	Reversible			
				Sewer Alternative 1			None	Short-term	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible			
				Layout Proposal			Neighbouring	Short-term	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible			
				Layout Alternative			None	Short-term	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible			
				No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable
Negative	Water quality		Sewer Proposal	No	Direct	Neighbouring	Incidental	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, stormwater management, dry season construction, filtration. Due to the fact that the alternative pipeline traverses most of the wetland, the intensity of the impact is likely to be higher and thus the proposal is preferred. Further, from a layout perspective, the proposed layout is also preferred as it reduces the FAR and the associated traffic and thus the full extent of Road B is not required. No road construction will thus take place within the wetland. In addition, the following general measures should be implemented: <ul style="list-style-type: none"> Chemical toilets must be supplied and maintained during the construction phase Ablution facilities (chemical toilets) are to be provided by the Contractor, at a ratio of 1:10. Ablution facilities (chemical toilets) must be erected within 100m from all workplaces but within the development footprint. Toilets are to be secured to the ground, and must have a closing mechanism. Toilet paper must be provided at these facilities and must be serviced once per week. Certified contractors to maintain and remove chemical toilets regularly. The contractor must ensure that spillage does not occur when toilets are cleaned/serviced and contents must be properly stored and disposed of. Discharge of waste into the environment and/or burial of waste are strictly prohibited. Sanitary arrangements must be to the satisfaction of the PM, ECO, the local authorities and the applicable legal requirements. Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored and conduct a pre start-up inspection checklist. Drip trays must be checked and replaced for vehicles standing (parked) for prolonged periods. Drip trays must be of a sufficient size and volume to collect any hydrocarbon leakages from a stationary vehicle. Spill kits (absorbent material) must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste site. Significant spills should be reported to the Project Manager or Contractors Manager and ECO who should report this to the relevant authority 	Very High	Low	No Loss	Reversible				
			Sewer Alternative 1			Neighbouring	Incidental	Medium-High	Highly Likely	Low-Medium	High		Medium	Low	No Loss	Reversible				
			Layout Proposal			Neighbouring	Incidental	Low-Medium	Likely	Low	High		Very High	Low	No Loss	Reversible				
			Layout Alternative			Neighbouring	Short-term	Medium-High	Highly Likely	Low-Medium	High		Medium	Low	No Loss	Reversible				
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	None	None required. However, it should be noted that the existing state of the wetland is poor and will continue to deteriorate without rehabilitation.	Not Applicable	None	Not Applicable	Not Applicable
			Negative			Flow regime		Sewer Proposal	No	Indirect	Local		Short-term	Low-Medium	Highly Likely	Low-Medium	High	<ul style="list-style-type: none"> The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, stormwater management, dry season construction, filtration. Due to the fact that the alternative pipeline traverses most of the wetland, the intensity of the impact is likely to be higher and thus the proposal is preferred. Further, from a layout perspective, the proposed layout is also preferred as it reduces the FAR and the associated traffic and thus the full extent of Road B is not required. No road construction will thus take place within the wetland. In addition, the following general measures should be implemented: <ul style="list-style-type: none"> Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation with landscape architect and ECO should be done if and where required. To reduce the loss of material by erosion, disturbance must be kept to a minimum. Where possible, natural vegetation should be retained to reduce the risk of erosion. Silt fences must be used to stabilise the site, reduce erosion and silt entering the natural environment. No unchecked silt may enter the natural environment. Proper stormwater management as per the approved stormwater management plan. Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. 	High	Low
Sewer Alternative 1	Local	Short-term		Medium-High	Highly Likely			Medium			High	Medium	Low-Medium	No Loss	Reversible					
Layout Proposal	Neighbouring	Short-term		Low	Highly Likely			Low			High	High	Low	No Loss	Reversible					

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Impacts to Wetlands		Layout Alternative			Local	Short-term	Medium-High	Highly Likely	Medium	High	<ul style="list-style-type: none"> Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase. Surface-water run-off and stormwater must be directed away from trenches and areas of excavation. 	Medium	Low-Medium	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required. However, it should be noted that the existing state of the wetland is poor and will continue to deteriorate without rehabilitation.	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Habitat	Sewer Proposal	Yes	Indirect	Site	Medium-term	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, minimal ingress and egress. Due to the fact that the alternative pipeline traverses most of the wetland the intensity of the impact is likely to be higher and thus the proposal is preferred. Further, from a layout perspective, the proposed layout is also preferred as it reduces the FAR and the associated traffic and thus the full extent of Road B is not required. No road construction will thus take place within the wetland. In addition, the following general measures should be implemented: <ul style="list-style-type: none"> The wetland area should be declared 'no-go' area's during the construction and must be demarcated prior to construction; All laydown, storage areas etc. should be restricted to within the development footprint; Compilation and implementation of a Wetland Rehabilitation Plan. 	High	Low	No Loss	Reversible
			Sewer Alternative 1			Site	Medium-term	Medium-High	Likely	Low-Medium	High		Medium	Low	No Loss	Reversible
			Layout Proposal			Site	Medium-term	Low-Medium	Likely	Low	High		High	Low	No Loss	Reversible
			Layout Alternative			Site	Medium-term	High	Highly Likely	Medium	High		Medium	Low-Medium	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable	Site	Long-term	Low-Medium	Likely		Low	High	None required. However, it should be noted that the existing state of the wetland is poor and will continue to deteriorate without rehabilitation.	Not Applicable
	Negative	Biota	Sewer Proposal	No	Indirect	Neighbouring	Medium-term	Medium	Likely	Low	High	<ul style="list-style-type: none"> The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, minimal ingress and egress. Due to the fact that the alternative pipeline traverses most of the wetland the intensity of the impact is likely to be higher and thus the proposal is preferred. Further, from a layout perspective, the proposed layout is also preferred as it reduces the FAR and the associated traffic and thus the full extent of Road B is not required. No road construction will thus take place within the wetland. In addition, the following general measures should be implemented: <ul style="list-style-type: none"> The wetland area should be declared 'no-go' area's during the construction and must be demarcated prior to construction; Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site; No trapping, killing or poisoning of any wildlife should be allowed on site; Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited. 	High	Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Medium-term	Medium-High	Likely	Low-Medium	High		Medium	Low	No Loss	Reversible
			Layout Proposal			Neighbouring	Medium-term	Medium	Likely	Low	High		High	Low	No Loss	Reversible
			Layout Alternative			Neighbouring	Medium-term	Medium-High	Highly Likely	Medium	High		Medium	Low-Medium	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable
	Negative	Geomorphology	Sewer Proposal	No	Direct	Neighbouring	Medium-term	Medium	Likely	Low	High	<ul style="list-style-type: none"> The following mitigation measures suggested by the wetland specialist apply: Stormwater management design and erosion control measures. Due to the fact that the alternative pipeline traverses most of the wetland, the intensity of the impact is likely to be higher and thus the proposal is preferred. Further, from a layout perspective, the proposed layout is also preferred as it reduces the FAR and the associated traffic and thus the full extent of Road B is not required. No road construction will thus take place within the wetland. In addition, the following general measures should be implemented: <ul style="list-style-type: none"> Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation with landscape architect and ECO should be done if and where required. To reduce the loss of material by erosion, disturbance must be kept to a minimum. Where possible, natural vegetation should be retained to reduce the risk of erosion. Proper stormwater management as per the approved stormwater management plan. Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase. Surface-water run-off and stormwater must be directed away from trenches and areas of excavation. 	High	Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Medium-term	Medium-High	Highly Likely	Medium	High		Medium	Low-Medium	No Loss	Reversible
			Layout Proposal			Neighbouring	Medium-term	Medium	Likely	Low	High		High	Low	No Loss	Reversible
Layout Alternative			Neighbouring			Medium-term	Medium-High	Highly Likely	Medium	High	Medium		Low-Medium	No Loss	Reversible	
No-Go Option			Not Applicable			Not Applicable	None	None	None	None	None		Not Applicable	None required	Not Applicable	None
Waste Generation	Negative	Domestic waste	Yes	Direct	Local	Short-term	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> Waste recycling to be put in place. Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable. All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes. 	Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	
					No-Go Option	Not Applicable	Not Applicable	None	None	None		None	None	High	None required	Not Applicable
	Negative	Construction waste	Yes	Direct	Local	Short-term	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> Due to the extent of Road B, the alternative layout with an FAR of 0.8 would be expected to produce more construction rubble. The proposed layout is therefore preferred. Litter (from outside the camp included) and concrete bags etc. must be collected and put into suitable closed bins on a daily basis. Construction rubble must be disposed of at a registered site No Construction rubble may be used for infilling. 	Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	
					Local	Short-term	Low-Medium	Likely	Low	High		Medium	Low	No Loss	Reversible	

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Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Negative	Hazardous waste	Layout Alternative			Local	Short-term	Medium-High	Likely	Low-Medium	High		Medium	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
		Sewer Proposal			Local	Short-term	Low-Medium	Likely	Low	Low	High	<ul style="list-style-type: none"> The classification of waste determines the handling methods and the ultimate disposal of the material. The contractor shall manage hazardous waste that are anticipated to be generated by his operations as follows: Characterise the waste to determine if it is general or hazardous. Obtain and provide an acceptable container with a label. Place hazardous waste material in the container. Inspect the container on a regular basis. Haul the full container to the licenced and correct disposal site. Provide documentary evidence of proper disposal of the waste. Only temporary storage of waste is allowed (once of storage of waste for a period less than 90 days). The volume of material should be limited to less than 80m³ of hazardous waste. Should this be exceeded the Norms and Standards for the Storage of Waste will need to be complied with. 	Medium	Low	No Loss	Reversible
		Sewer Alternative 1	Yes	Direct	Local	Short-term	Low-Medium	Likely	Low	Low	High		Medium	Low	No Loss	Reversible
		Layout Proposal			Local	Short-term	Low-Medium	Likely	Low	Low	High		Medium	Low	No Loss	Reversible
		Layout Alternative			Local	Short-term	Low-Medium	Likely	Low	Low	High		Medium	Low	No Loss	Reversible
No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Loss of topsoil	Sewer Proposal	Yes	Direct	Neighbouring	Permanent	Low-Medium	Definite	Medium	High	<p>With the sewer pipelines, loss of top soil is not expected to be significant as the pipeline will occur in a 3m wide servitude and will be separated and then replaced in the excavation. There is no real difference between the pipeline alternatives. However with the alternative layout, the full extent of Road B will be developed and will result in the loss of some topsoil. The proposed layout is therefore preferred.</p> <p>* Top soil should be separated and re-used where possible.</p>	Medium	Low	Partial	High Degree	
		Sewer Alternative 1			Neighbouring	Permanent	Low-Medium	Definite	Medium	High		Medium	Low	Partial	High Degree	
		Layout Proposal			Neighbouring	Permanent	Medium	Definite	Medium	High		Low	Low-Medium	Partial	High Degree	
		Layout Alternative			Neighbouring	Permanent	Medium-High	Definite	Medium-High	High		Low	Medium	Partial	High Degree	
		No-Go Option	Yes	Direct	Site	Long-term	Low-Medium	Definite	Low-Medium	High		High	The site is degraded by historic land use. It is likely that there will be a continued loss of topsoil should the development not proceed as the site will remain in its degraded state.	None	Low-Medium	Partial
	Negative	Impact to sheep grazing land and irrigated fields	Sewer Proposal	Yes	Direct	Neighbouring	Short-term	Low-Medium	Definite	Low	High	<p>* Please note that according to the Gauteng Agricultural Potential Atlas IV, the agricultural potential of the site and the affected development footprint of the services is low to moderate. Affected landowners have raised concerns regarding the impact of the of the sewer line and road on sheep grazing land as well as existing irrigated fields. In order to address this, two additional alternatives were assessed: Proposed layout (FAR = 0.4) and Alternative Layout (FAR=0.8). With the new proposed layout with the reduced FAR, the full extent of Road B is not required and thus the impact on affected landowner's grazing is reduced. There is also no impact on irrigated fields. The proposed layout is therefore preferred. In terms of the sewer line, both lines traverse grazing land however only the alternative pipeline route will affect the irrigated area. Therefore the proposed pipeline route is preferred. In addition, a number of specific measures have been recommended to reduce the impact of the sewer line on sheep grazing pastures:</p> <ul style="list-style-type: none"> Access to all private properties will be negotiated between the developer and the landowner in question. Issues regarding compensation will be dealt with as part of this contractual stage. Access to private property will only be allowed by consent. Potential to allow connection to the new sewer line should be discussed and implemented if feasible and acceptable to the landowner in question. Where possible the construction of the pipeline will be undertaken in sections in line with property boundaries. Based on discussions with the engineer, it is understood that the excavation, laying of pipeline and closing of the excavation of approximately 300m will take 1 week. It is therefore feasible that the pipeline be developed property by property so to limit the time that each property is impacted. Grazing would therefore be limited for a short period only. The right of way/servitude for the pipeline is 3m. No additional clearing of excavation will be permitted. During site preparation, topsoil and subsoil must be stripped separately from each other and must be stored separately from spoil material for use in the rehabilitation phase. Programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material. Execute top soiling activity prior to the rainy season or any expected wet weather conditions. Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter. Replace topsoil to the original depth. Place topsoil in the same area from where it was stripped. Rip and/or scarify all areas following the application of topsoil to facilitate mixing of the upper most layers. No litter, rubble or any other construction material shall remain on site once the pipeline is completed. ECO to undertake a rehabilitation audit at the completion of the pipeline and then again in 6 months to ensure that rehabilitation has been undertaken as necessary and to ensure no undue alien invasive plant species are establishing. Should electric fencing or fencing need to be removed this must be agreed to by affected landowners. All electric fencing/fencing must be replaced as soon as construction in the property is completed. All construction workers must be easily identifiable. The contractor and/or project manager must appoint a specific staff member to act as the landowner liaison officer to ensure clear and dedicated communication channels. All affected and adjacent landowners should have the contact details of the liaison officer as well as the ECO. An Issues Register should be set up and all comments, queries and complaints should be noted. Details on how these issues have been resolved should be noted. 	Medium	Low	Partial	High Degree
			Sewer Alternative 1			Neighbouring	Short-term	Medium	Definite	Low-Medium	High		Medium	Low	Partial	High Degree
			Layout Proposal			Neighbouring	Short-term	Low-Medium	Definite	Low	High		Medium	Low	Partial	High Degree
			Layout Alternative			Neighbouring	Permanent	Medium-High	Definite	Medium-High	High		Low	Medium	Partial	High Degree
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required
Soil Alteration																

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Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Negative	Loss of land capability	Sewer Proposal	Yes	Direct	Site	Permanent	Low	Definite	Low-Medium	High	<ul style="list-style-type: none"> Please note that according to the Gauteng Agricultural Potential Atlas IV, the agricultural potential of the site and the affected development footprint of the services is low to moderate. Portion 260 also falls part of the Mixed Use Development Zone of the Muldersdrift Precinct Plan and is thus not planned for agriculture. Therefore, it is not expected to be a significant loss. In terms of the sewer pipeline, impacts to land capability are expected to be mitigated to a low level as the impact is during construction and the fields will regrow. However, impacts related to the development of the alternative layout (FAR = 0.8) and the associated Road B are expected to be higher as the road is permanent infrastructure and would change the land capability. The proposed layout is therefore preferred. 	Low	Low	Partial	High Degree	
		Sewer Alternative 1			Site	Permanent	Low	Definite	Low-Medium	High		Low	Low	Partial	High Degree	
		Layout Proposal			Site	Permanent	Low	Definite	Low-Medium	High		None	Low-Medium	Partial	High Degree	
		Layout Alternative			Site	Permanent	Medium-High	Definite	Medium-High	High		None	Medium	Partial	High Degree	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None		High	None required	Not Applicable	None	Not Applicable
Negative	Alteration of topography	Sewer Proposal	No	Direct	Neighbouring	Permanent	Low-Medium	Definite	Medium	High	<ul style="list-style-type: none"> Some of the Topography within the development footprint will be altered as part of the development. In order to ensure the change in topography does not impact stormwater, the following must be implemented: Stormwater management measures must be implemented to ensure these designs do not impact on stormwater. 	Low	Low-Medium	Partial	High Degree	
		Sewer Alternative 1			Neighbouring	Permanent	Low-Medium	Definite	Medium	High		Low	Low-Medium	Partial	High Degree	
		Layout Proposal			Neighbouring	Permanent	Low-Medium	Definite	Medium	High		Low	Low-Medium	Partial	High Degree	
		Layout Alternative			Neighbouring	Permanent	Low-Medium	Definite	Medium	High		Low	Low-Medium	Partial	High Degree	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None		High	None required	Not Applicable	None	Not Applicable
Negative	Soil pollution	Sewer Proposal	No	Direct	Neighbouring	Incidental	Low-Medium	Likely	Low	High	<ul style="list-style-type: none"> Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored and conduct a pre start-up inspection checklist. All vehicle/equipment maintenance and washing must be done in the workshop area, equipped with a bund wall and grease trap oil separator. Workshop area must be monitored for fuel and oil spills. Drip trays must be checked and replaced for vehicles standing (parked) for prolonged periods. Drip trays must be of a sufficient size and volume to collect any hydrocarbon leakages from a stationary vehicle. Spill kits (absorbent material) must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste site. Significant spills should be reported to the Project Manager or Contractors Manager and ECO who should report this to the relevant authority. Waste must be managed in line with the requirements of the EMP (see above). 	High	Low	No Loss	Reversible	
		Sewer Alternative 1			Neighbouring	Incidental	Low-Medium	Likely	Low	High		High	Low	No Loss	Reversible	
		Layout Proposal			Neighbouring	Incidental	Low-Medium	Likely	Low	High		High	Low	No Loss	High Degree	
		Layout Alternative			Neighbouring	Incidental	Low-Medium	Likely	Low	High		High	Low	No Loss	High Degree	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None		High	None required	Not Applicable	None	Not Applicable
Resource Consumption	Negative	Electricity consumption	Yes	Direct	Sewer Proposal	None	None	None	None	None	<ul style="list-style-type: none"> During the construction phase the contractors will mainly make use of generators. 	None	None	No Loss	Reversible	
					Sewer Alternative 1	None	None	None	None	None		None	None	No Loss	Reversible	
					Layout Proposal	None	None	None	None	None		None	None	No Loss	Reversible	
					Layout Alternative	None	None	None	None	None		None	None	No Loss	Reversible	
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None		None	High	None required	Not Applicable	None
	Negative	Water consumption	Yes	Direct	Sewer Proposal	Local	Short-term	Low-Medium	Definite	Low-Medium	High	<ul style="list-style-type: none"> Enforce water saving strategies. Environmental awareness training. 	Low	Low	No Loss	Reversible
					Sewer Alternative 1	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
					Layout Proposal	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
					Layout Alternative	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
	Negative	Fuel consumption	Yes	Direct	Sewer Proposal	Local	Short-term	Low-Medium	Definite	Low-Medium	High	<ul style="list-style-type: none"> Record and monitor fuel consumption regularly Reduce theft of fuel (increase security) 	Low	Low	No Loss	Reversible
					Sewer Alternative 1	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
					Layout Proposal	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
					Layout Alternative	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
			No-Go Option	Not Applicable	Not Applicable	None	Short-term	None	None	None	None	High	None required	Not Applicable	None	Not Applicable
	Negative	Raw materials consumption	Yes	Direct	Sewer Proposal	Local	Short-term	Low-Medium	Definite	Low-Medium	High	<ul style="list-style-type: none"> Raw material usage is expected to be higher for the alternative layout due to the fact that the full extent of Road B would be required. The proposed layout is therefore preferred. Promote effective use of raw material. 	Low	Low	No Loss	Reversible
					Sewer Alternative 1	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
					Layout Proposal	Local	Short-term	Low-Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
					Layout Alternative	Local	Short-term	Medium	Definite	Low-Medium	High		Low	Low	No Loss	Reversible
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable
		Loss of habitat due to Digging and laying	Sewer Proposal	Yes	Direct	Neighbouring	Permanent	Low-Medium	Definite	Medium	High	<ul style="list-style-type: none"> In terms of the pipeline alternatives, the proposed pipeline is designed to stay outside the wetland and 32m buffer as far as possible. It also does not enter within the C-Plan ESA area and only enters the Zone 3 of the GPEMF at the connection point. It therefore reduces the impact to sensitive vegetation (note however that an ecological assessment was undertaken and found that the site is highly disturbed and already developed in parts and the loss of habitat is not significant). Further, with the proposed layout (FAR = 0.4) the traffic impact is reduced and as such there is no longer the need for the full extent of Road B. 	Medium	Low	Partial	High Degree
Sewer Alternative 1			Neighbouring			Permanent	Medium-High	Definite	Medium-High	High	Low		Low-Medium	Partial	High Degree	

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Negative	foundations (including for services infrastructure)	Layout Proposal	Yes	Direct	Neighbouring	Permanent	Low	Definite	Medium	High	<p>ROAD B. There is therefore no road development within the ESA, wetland, wetland buffer or Zone 3 and as such, the proposed layout is preferred.</p> <p>The following mitigation measures suggested by the specialist will be undertaken: All construction activities other than those authorised must be outside of the wetland 32m buffer</p>	Medium	Low	Partial	High Degree	
		Layout Alternative			Neighbouring	Permanent	High	Definite	Medium-High	High		Low	Medium	Partial	High Degree	
		No-Go Option	Not Applicable		Not Applicable	None	None	None	None	None		None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable	None
	Loss of habitat due to construction camps & lay down areas	Sewer Proposal	Yes	Direct	Site	Medium-term	Medium-High	Likely	Low-Medium	Medium	<p>Both sewer lines and layouts will require construction camps and laydown areas. An ecological assessment was undertaken and found that the site is highly disturbed and already developed in parts and the loss of habitat is not significant. The following mitigation measures suggested by the specialist will be undertaken: Construction and laydown areas should be established outside of the wetland 32m buffer.</p>	Medium	Low	Partial	High Degree	
		Sewer Alternative 1			Site	Medium-term	Medium-High	Likely	Low-Medium	Medium		Medium	Low	Partial	High Degree	
		Layout Proposal			Site	Medium-term	Medium-High	Likely	Low-Medium	Medium		Medium	Low	Partial	High Degree	
		Layout Alternative			Site	Medium-term	Medium-High	Likely	Low-Medium	Medium		Medium	Low	Partial	High Degree	
		No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable
	Loss of sensitive vegetation (<i>Hypoxis and Boophone</i>)	Sewer Proposal	Yes	Direct	Neighbouring	Permanent	Medium-High	Likely	Low-Medium	High	<p>Whilst there is no difference between the proposed and alternative sewer lines, the proposed layout is preferred as it limits the development footprint as Road B is not required.</p> <p>The search, rescue and relocation plan as part of the Ecological Assessment must be implemented and all <i>Hypoxis</i> and <i>Boophone</i> species must be relocated within the development.</p>	High	Low	Partial	High Degree	
		Sewer Alternative 1			Neighbouring	Permanent	Medium-High	Likely	Low-Medium	High		High	Low	Partial	High Degree	
		Layout Proposal			Neighbouring	Permanent	Medium-High	Likely	Low-Medium	High		High	Low	Partial	High Degree	
		Layout Alternative			Neighbouring	Permanent	High	Likely	Low-Medium	High		High	Low	Partial	High Degree	
		No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable
	Loss of habitat - Stochastic events such as fire	Sewer Proposal	Yes	Direct	Neighbouring	Incidental	Medium-High	Likely	Low	Medium	<p>Impacts related to stochastic events are not effected by either the sewer line or layout alternatives.</p> <p>The following mitigation measures suggested by the specialist will be undertaken: Fires shall only be permitted in specially designated areas and under controlled circumstances.</p>	Medium	Low	Partial	High Degree	
		Sewer Alternative 1			Neighbouring	Incidental	Medium-High	Likely	Low	Medium		Medium	Low	Partial	High Degree	
Layout Proposal		Neighbouring			Incidental	Medium-High	Likely	Low	Medium	Medium		Low	Partial	High Degree		
Layout Alternative		Neighbouring			Incidental	Medium-High	Likely	Low	Medium	Medium		Low	Partial	High Degree		
No-Go Option		Not Applicable			Not Applicable	None	None	None	None	None		None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable	None
Negative	Direct mortality of fauna - Staff or construction workers poaching and hunting	Sewer Proposal	No	Direct	Neighbouring	Short-term	Low-Medium	Possible	Low	Medium	<p>Both pipeline routes and layouts are similar and thus impacts in regards to fauna mortality are similar. An ecological assessment and did not identify any sensitive fauna on site. The following mitigation measures suggested by the specialist will be undertaken: Snaring and hunting of fauna by construction workers on or adjacent to the study area are strictly prohibited.</p>	High	Low	Partial	High Degree	
		Sewer Alternative 1			Neighbouring	Short-term	Low-Medium	Possible	Low	Medium		High	Low	Partial	High Degree	
		Layout Proposal			Neighbouring	Short-term	Low-Medium	Possible	Low	Medium		High	Low	Partial	High Degree	
		Layout Alternative			Neighbouring	Short-term	Low-Medium	Possible	Low	Medium		High	Low	Partial	High Degree	
		No-Go Option			None	None	None	None	None	None		None	None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable
	Direct mortality of fauna - Intentional killing of fauna	Sewer Proposal	No	Direct	Site	Short-term	Low-Medium	Likely	Low	Medium	<p>Both pipeline routes and layouts are similar and thus impacts in regards to fauna mortality are similar. An ecological assessment and did not identify any sensitive fauna on site. The following mitigation measures suggested by the specialist will be undertaken: Killing of fauna on or adjacent to the study area are strictly prohibited. Should any fauna species be found on site, the ECO should be conducted asap to provide recommendation or mitigation measures.</p>	High	Low	Partial	High Degree	
		Sewer Alternative 1			Site	Short-term	Low-Medium	Likely	Low	Medium		High	Low	Partial	High Degree	
		Layout Proposal			Site	Short-term	Low-Medium	Likely	Low	Medium		High	Low	Partial	High Degree	
		Layout Alternative			Site	Short-term	Low-Medium	Likely	Low	Medium		High	Low	Partial	High Degree	
		No-Go Option			None	None	None	None	None	None		None	None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Effects on Biodiversity	Direct mortality of fauna - Vegetation and ground clearing (resulting in fauna mortality)	Sewer Proposal	Yes	Direct	Neighbouring	Short-term	Medium-High	Definite	Low-Medium	Medium	An ecological assessment and did not identify any sensitive fauna on site. The following mitigation measures suggested by the specialist will be undertaken: Killing of fauna on or adjacent to the study area are strictly prohibited. Should any fauna species be found on site, the ECO should be conducted asap to provide recommendation or mitigation measures. Clearing of vegetation is not allowed within the 32m buffer of the wetland area.	Low	Low	Partial	High Degree	
		Sewer Alternative 1			Neighbouring	Short-term	Medium-High	Definite	Low-Medium	Medium		Low	Low	Partial	High Degree	
		Layout Proposal			Neighbouring	Short-term	Medium-High	Definite	Low-Medium	Medium		Low	Low	Partial	High Degree	
		Layout Alternative			Neighbouring	Short-term	High	Definite	Medium	Medium		Low	Low-Medium	Partial	High Degree	
		No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable
	Negative	Disruption of ecological life cycles due to the restriction of species movement - Open trenches and other linear barriers	Sewer Proposal	Yes	Direct	Neighbouring	Short-term	Low-Medium	Highly Likely	Low	Medium	Trenches and other linear barriers should not be kept open for to long, especially not staying open over night. Due to the reduced FAR in the proposed layout, the full extent of Road B is not required and therefore will reduce the construction impact of open trenches/works. It is therefore preferred.	High	Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Short-term	Low-Medium	Highly Likely	Low	Medium		High	Low	No Loss	Reversible
			Layout Proposal			Neighbouring	Short-term	Low-Medium	Highly Likely	Low	Medium		High	Low	No Loss	Reversible
			Layout Alternative			Neighbouring	Permanent	Low-Medium	Definite	Medium	Medium		High	Low-Medium	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable
		Disruption of ecological life cycles due to the restriction of species movement - Infrastructure	Sewer Proposal	Yes	Direct	Site	Permanent	Low-Medium	Definite	Medium	High	Stormwater and road infrastructure should be designed in such a way that it will have minimal impact on the environmental, especially the wetland area. The proposed layout with reduced FAR is preferred as it reduces the disruption of ecological life cycles as the full extent of Road B is not required.	High	Low	No Loss	Reversible
			Sewer Alternative 1			Site	Permanent	Low-Medium	Definite	Medium	High		High	Low	No Loss	Reversible
			Layout Proposal			Site	Permanent	Low-Medium	Definite	Medium	High		High	Low	No Loss	Reversible
			Layout Alternative			Site	Permanent	Medium-High	Definite	Medium-High	High		High	Low-Medium	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable
	Negative	Disruption of ecological life cycles due to noise and lighting - Noise during construction	Sewer Proposal	Yes	Direct	Site	Short-term	Low-Medium	Highly Likely	Low	High	Construction must be restricted to hours of 07:00 and 17:00. Should construction activities need to continue over a weekend/public holiday or is expected to be excessively noisy, all Interested and Affected Parties and the ECO must be notified in advance.	Medium	Low	No Loss	Reversible
			Sewer Alternative 1			Site	Short-term	Low-Medium	Highly Likely	Low	High		Medium	Low	No Loss	Reversible
			Layout Proposal			Site	Short-term	Low-Medium	Highly Likely	Low	High		Medium	Low	No Loss	Reversible
			Layout Alternative			Site	Short-term	Low-Medium	Highly Likely	Low	High		Medium	Low	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable
Negative	Disruption of ecological life cycles due to noise and lighting - Noise during construction	Sewer Proposal	Yes	Direct	Site	Incidental	Medium-High	Highly Likely	Low-Medium	High	Construction must be restricted to hours of 07:00 and 17:00. Should construction activities need to continue after hours is, all Interested and Affected Parties and the ECO must be notified in advance. Excessive lighting during construction should be avoided.	Medium	Low	No Loss	Reversible	
		Sewer Alternative 1			Site	Short-term	Medium-High	Highly Likely	Low-Medium	High		Medium	Low	No Loss	Reversible	
		Layout Proposal			Site	Incidental	Medium-High	Highly Likely	Low-Medium	High		Medium	Low	No Loss	Reversible	
		Layout Alternative			Site	Short-term	Medium-High	Highly Likely	Low-Medium	High		Medium	Low	No Loss	Reversible	
		No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable	None

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Negative	Introduction of alien flora affecting native faunal assemblages - Vehicles and machinery	Sewer Proposal	Yes	Direct	Site	Short-term	Medium	Likely	Low	High	Alien, invasive species found within the construction area should be eradicated as far as possible and disposed of at a registered site. Measures to prevent siltation from entering the wetland area, should be implemented throughout the construction phase.	High	Low	No Loss	Reversible	
		Sewer Alternative 1			Site	Short-term	Medium	Likely	Low	High		High	Low	No Loss	Reversible	
		Layout Proposal			Site	Short-term	Medium	Likely	Low	High		High	Low	No Loss	Reversible	
		Layout Alternative			Site	Short-term	Medium	Likely	Low	High		High	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Introduction of alien flora affecting native faunal assemblages - soil disturbances	Sewer Proposal	Yes	Direct	Site	Short-term	Medium-High	Likely	Low	High	As the sewer proposal and alternative are similar, impacts are expected to be similar. However with the alternative layout, Road B is required and due to the larger development footprint, a greater impact is expected. The following measures must be implemented. Alien, invasive species found within the construction area should be eradicated as far as possible and disposed of at a registered site. Measures to prevent siltation from entering the wetland area, should be implemented throughout the construction phase.	High	Low	No Loss	Reversible	
		Sewer Alternative 1			Site	Permanent	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible	
		Layout Proposal			Site	Short-term	Medium-High	Likely	Low	High		High	Low	No Loss	Reversible	
		Layout Alternative			Site	Permanent	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Pollution incidents	Sewer Proposal	No	Direct	Site	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> Spill kits to be located in strategic areas for when needed Regular site and plant inspection must be conducted Environmental awareness training 	Low	Low	No Loss	Reversible	
		Sewer Alternative 1			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Proposal			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Alternative			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Health and safety	Sewer Proposal	No	Direct	Site	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> 24 hour security and access control. Health and Safety awareness training. Contractor to submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for approval prior to the commencement of work. A Safety Agent should be appointed A Dedicated Occupational Health and Safety system to be implemented by Contractor's Safety Officer. To be monitored and audited by the Client's Safety Agent, in terms of the Construction Regulations (2003). 	Low	Low	No Loss	Reversible	
		Sewer Alternative 1			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Proposal			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Alternative			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Storage of hydrocarbons	Sewer Proposal	No	Direct	Site	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> Best practice regarding storage of substances Spill kits to be located in strategic areas for when needed Environmental awareness training Firefighting equipment must be accessible on site at all times. Display of emergency numbers 	Low	Low	No Loss	Reversible	
		Sewer Alternative 1			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Proposal			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Alternative			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Fire	Sewer Proposal	No	Direct	Neighbouring	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> Adhere to the appropriate emergency procedures Firefighting equipment must be accessible on site at all times. Display of emergency numbers In addition, designated smoking areas should be provided and there should be zero tolerance to smoking outside these areas. Cooking over open flames is not allowed. 	Low	Low	No Loss	Reversible	
		Sewer Alternative 1			Neighbouring	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Proposal			Neighbouring	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		Layout Alternative			Neighbouring	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible	
		No-Go Option	No	Direct	Neighbouring	Incidental	Low-Medium	Possible	Low	High	The site is currently unoccupied and the risk for fire remains.	None	Low	No Loss	Reversible	

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Social	Negative	Visual impact	Yes	Direct	Neighbouring	Short-term	Low	Possible	Low	High	The Heritage Impact Assessment noted "Visual impacts to scenic routes and sense of place are also considered to be low due to the existing developments in the greater area. However, during construction, the site will be screened or walled off to reduce visual impacts."	High	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low	Possible	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low	Possible	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low	Possible	Low	High		High	Low	No Loss	Reversible	
					No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None
	Negative	Safety and security	No	Direct	Neighbouring	Short-term	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> 24 hour access control to the site and 24 hour security. Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be disciplined. During the public review of the BAR, affected landowners raised concerns regarding safety and security of their property and stud sheep. A number of measures are therefore included in the EMPR including: All workers must be easily identifiable with name tags and appropriate safety vests etc. Access to private property must be by agreement only. A landowner liaison officer should be appointed and contact with the landowners must be made before any entry to the private property is made. The sewer pipeline should be phased so that the impact is localised to one property at a time and once completed, access to the site by workers will not be permitted. 	Medium	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low-Medium	Possible	Low	High		Medium	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low-Medium	Possible	Low	High		Medium	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low-Medium	Possible	Low	High		Medium	Low	No Loss	Reversible	
					No-Go Option	No	Direct	Neighbouring	Long-term	Low-Medium	Possible	Low	High	The site is currently unoccupied. Should the develop not take place, there may be further safety and security issues in the area.	None	Low
	Negative	Traffic disruptions	No	Direct	Neighbouring	Short-term	Low-Medium	Highly Likely	Low	High	<ul style="list-style-type: none"> Traffic calming measures and appropriate signage to be implemented. New roads and road/intersection upgrades to be implemented as per the TIA. Speed limits on all existing roads must be adhered to at all times. 	High	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low-Medium	Highly Likely	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low-Medium	Highly Likely	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low-Medium	Highly Likely	Low	High		High	Low	No Loss	Reversible	
					No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None
	Negative	Loss of cultural and palaeontological heritage	No	Direct	Local	Permanent	Low	Improbable	Low	High	<p>A Heritage Impact Assessment was undertaken and the following mitigation measures recommended:</p> <ul style="list-style-type: none"> A heritage walkdown of linear infrastructure should be conducted prior to construction; Confirmation of any burial sites within the study area during the public participation process; It is recommended that a Chance Find Procedure should be implemented for the project should any heritage resources be identified during the construction phase of the project. <p>The site does not occur in a significant palaeontological area. There was no preference between either the proposal or alternative sewer line or layout alternatives.</p>	High	Low	Irreplaceable	Irreversible	
					Local	Permanent	Low	Improbable	Low	High		High	Low	Irreplaceable	Irreversible	
					Local	Permanent	Low	Improbable	Low	High		High	Low	Irreplaceable	Irreversible	
					Local	Permanent	Low	Improbable	Low	High		High	Low	Irreplaceable	Irreversible	
					No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None
				Direct	Neighbouring	Short-term	Low	Possible	Low	High		Low	Low	No Loss	Reversible	
					Neighbouring	Short-term	Low	Possible	Low	High		Low	Low	No Loss	Reversible	

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Negative	Loss of sense of place	Layout Proposal	No	Direct	Neighbouring	Short-term	Low	Possible	Low	High	<ul style="list-style-type: none"> No mitigation to be shown. Good housekeeping practices to be followed 	Low	Low	No Loss	Reversible	
		Layout Alternative			Neighbouring	Short-term	Medium	Likely	Low	High		Low	Low	No Loss	Reversible	
		No-Go Option	Not Applicable		Not Applicable	None	None	None	None	None		High	None required	Not Applicable	None	Not Applicable
	Positive	Change of land use	Sewer Proposal	Yes	Direct	Neighbouring	Permanent	Low-Medium	Definite	+ Medium	High	<p>A Townplanning process is currently being undertaken to change the land use associated with the site. The proposed change in land use is in line with the Muldersdrift Precinct Plan. The proposed sewer lines will not affect land use.</p> <p>The proposed layout is preferred as it does not require the development of road B on adjacent properties and therefore does not change the land use of adjacent properties.</p> <p>No mitigation measures other than the townplanning process is required.</p>	Low	+ Medium	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Permanent	Low-Medium	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
			Layout Proposal			Neighbouring	Permanent	Low-Medium	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
Layout Alternative			Neighbouring			Permanent	Medium	Definite	Medium	High	Very Low		Low-Medium	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable		
Negative	Impact to private infrastructure and property (including livestock)	Sewer Proposal	No	Direct	Neighbouring	Short-term	Low-Medium	Definite	Low	High	<p>During the public review of the BAR, affected landowners raised concerns regarding the impact of the services (Road B and the sewer line) on electric fencing, existing outbuildings and expensive stud sheep. A number of measures are therefore included in the EMPR to mitigate potential impacts including:</p> <ul style="list-style-type: none"> - All workers must be easily identifiable with name tags and appropriate safety vests etc. - Access to private property must be by agreement only. - A landowner liaison officer should be appointed and contact with the landowners must be made before any entry to the private property is made. - The sewer pipeline should be phased so that the impact is localised to one property at a time and once completed, access to the site by workers will not be permitted. - Should electric fencing or fencing need to be removed this must be agreed to by affected landowners. - All electric fencing/fencing must be replaced as soon as construction in the property is completed. - An Issues Register should be set up and all comments, queries and complaints should be noted. Details on how these issues have been resolved should be noted. <p>Due to the fact that the FAR is lower, the full extent of Road B is not required as part of the proposed layout. This therefore reduces the impact on affected properties (including outbuildings, irrigated land etc). It is therefore preferred from this perspective.</p>	Medium	Low	No Loss	Reversible	
		Sewer Alternative 1			Neighbouring	Short-term	Low-Medium	Definite	Low	High		Medium	Low	No Loss	Reversible	
		Layout Proposal			Neighbouring	Short-term	Low-Medium	Definite	Low	High		Medium	Low	No Loss	Reversible	
		Layout Alternative			Neighbouring	Long-term	Medium	Definite	Medium	High		Medium	Low-Medium	No Loss	Reversible	
		No-Go Option			No	Direct	Neighbouring	Long-term	Low-Medium	Possible		Low	High	The site is currently unoccupied. Should the develop not take place, there may be further safety and security issues in the area.	None	Low
	Positive	Decline/increase in economy	Sewer Proposal	Yes	Direct	Local	Short-term	Medium-High	Definite	+ Medium	High	<p>The proposed CAPEX value of the development is R15 000 000.00. This will have numerous multiplier effects in the local community. In order to ensure that this benefits the local community, it is recommended that local labour and suppliers are used where possible.</p>	Low	+ Medium	No Loss	Reversible
			Sewer Alternative 1			Local	Short-term	Medium-High	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
			Layout Proposal			Local	Short-term	Medium-High	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
			Layout Alternative			Local	Short-term	Medium-High	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
			No-Go Option			Local	Long-term	Medium	Definite	Medium	High	Should the development not proceed, the benefits to the local community will be long term and negative. Further, the goals of the Muldersdrift Precinct Plan will also not be met. There are no mitigation measures available.	None	Medium	Partial	High Degree
Positive	Decline/increase in property value	Sewer Proposal	No	Direct	Neighbouring	Permanent	Medium	Definite	+ Medium	High	<p>The development of the proposed development will increase the property value of the site overall. Further, it will have a knock on effect and is likely to increase the value of neighbouring properties as well. No mitigation measures are required.</p>	None	+ Medium	No Loss	Reversible	
		Sewer Alternative 1			Neighbouring	Permanent	Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible	
		Layout Proposal			Neighbouring	Permanent	Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible	
		Layout Alternative			Neighbouring	Permanent	Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible	
			No-Go Option			Neighbouring	Long-term	Medium	Definite	Medium	High	The site was vacant and is degraded and without development, the property value is likely to decrease. This will have knock on effects on the surrounding properties. No mitigation, save for development of the site, is available.	None	Medium	No Loss	Reversible

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Positive	Employment	Sewer Proposal	Yes	Direct	Local	Short-term	Medium-High	Definite	+ Medium	None	The proposed development will result in approximately 150 construction related employment opportunities for the local community. Local labour should be utilised as far as possible.	None	+ Medium	No Loss	Reversible	
		Sewer Alternative 1			Local	Short-term	Medium-High	Definite	+ Medium	None		+ Medium	No Loss	Reversible		
		Layout Proposal			Local	Short-term	Medium-High	Definite	+ Medium	None		+ Medium	No Loss	Reversible		
		Layout Alternative			Local	Short-term	Medium-High	Definite	+ Medium	None		+ Medium	No Loss	Reversible		
		Negative	No-Go Option	Local	Long-term	Medium	Definite	Medium	None	Medium	None	Should the development not proceed, the benefits to the local community will be long term and negative as potential employment opportunities will be lost. No mitigation measures are available.	None	Medium	No Loss	Reversible
OPERATIONAL PHASE																
Atmospheric Emissions	Not Applicable	Dust emissions	Not Applicable	Not Applicable	None	None	None	Highly Likely	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Emissions from vehicles and equipment (CO2, NOx, SOx, VOC's etc.)	Yes	Direct	None	None	None	Highly Likely	None	High	Impacts not applicable to the operational phase as the development will not result in more cars being produced. No mitigation required.	Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		Not Applicable	None	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Noise	No	Direct	Neighbouring	Long-term	Low	Possible	Low	High	Noise increases are expected to be more significant with Road B (Alternative Layout). Therefore the proposed layout is preferred. The Body corporate/Management Board should develop rules and regulations to manage noise in line with applicable by-laws.	High	Low	No Loss	Reversible	
					Neighbouring	Long-term	Low	Possible	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Long-term	Low	Possible	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Long-term	Low	Possible	Low	High		High	Low	No Loss	Reversible	
					None	None	None	None	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Water quality	No	Direct	Neighbouring	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> A Outline Scheme Report has been undertaken and noted that sewer will connect to an existing sewer line approximately 1.1km away from the site. This new sewer pipeline must be implemented. Due to the decreased length of pipeline in the wetland and thus the decreased potential for sewer spills, the proposal should be implemented. Further, the proposed layout is preferred as it decreases traffic and as such Road B is not required at this stage. Maintenance and management of the sewer connection must be undertaken as per Mogale's requirements In addition, the following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management. 	High	Low	No Loss	Reversible		
				Neighbouring	Incidental	Medium-High	Possible	Low	High		High	Low	No Loss	Reversible		
				Neighbouring	Incidental	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible		
				Neighbouring	Incidental	Medium-High	Possible	Low	High		High	Low	No Loss	Reversible		
				None	None	None	None	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable	
	Not Applicable	Flow regime	No	Direct	Neighbouring	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management. Further, Alternative 1 is not preferred as the impacts to flow would be greater due to the deeper pond. Due to the decreased length of pipeline in the wetland and thus the decreased impact on the flow regime, the proposed layout should be implemented. Further due to the smaller extent of Road B required, the proposed layout should also be implemented. 	High	Low	No Loss	Reversible	
					Neighbouring	Incidental	Medium-High	Possible	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Incidental	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible	
					Neighbouring	Incidental	Medium-High	Possible	Low	High		High	Low	No Loss	Reversible	
					None	None	None	Highly Likely	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
		Sewer Proposal			Site	Incidental	Low-Medium	Improbable	Low	High	High	Low	No Loss	Reversible		

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)		
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility		
Impacts to Wetlands	Negative	Habitat	Sewer Alternative 1	Yes	Indirect	Site	Incidental	Medium-High	Improbable	Low	High	<ul style="list-style-type: none"> The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management. Due to the decreased length of pipeline in the wetland and thus the decreased impact on the wetland habitat, the proposal should be implemented. Further due to the smaller extent of Road B required, the proposed layout should also be implemented. 	High	Low	No Loss	Reversible	
			Layout Proposal			Site	Incidental	Low-Medium	Improbable	Low	High		High	Low	No Loss	Reversible	
			Layout Alternative			Site	Incidental	Medium-High	Improbable	Low	High		High	Low	No Loss	Reversible	
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable	None
	Negative	Biota	Sewer Proposal	No	Indirect	Neighbouring	Incidental	Low-Medium	Possible	Low	High	<ul style="list-style-type: none"> The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management. Due to the decreased length of pipeline in the wetland and thus the decreased impact on the wetland habitat, flow regime and associated biota, the proposal should be implemented. Further due to the smaller extent of Road B required, the proposed layout should also be implemented. 	High	Low	No Loss	Reversible	
			Sewer Alternative 1			Neighbouring	Incidental	Medium-High	Possible	Low	High		High	Low	No Loss	Reversible	
			Layout Proposal			Neighbouring	Incidental	Low-Medium	Possible	Low	High		High	Low	No Loss	Reversible	
			Layout Alternative			Neighbouring	Incidental	Medium-High	Possible	Low	High		High	Low	No Loss	Reversible	
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Not Applicable	Geomorphology	Sewer Proposal	No	Indirect	Site	Incidental	Low	Improbable	Low	High	<ul style="list-style-type: none"> The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area. Due to the decreased length of pipeline in the wetland and thus the decreased impact on the geomorphology, the proposal should be implemented. Further due to the smaller extent of Road B required, the proposed layout should also be implemented. 	High	Low	No Loss	Reversible	
			Sewer Alternative 1			Site	Incidental	Low	Improbable	Low	High		High	Low	No Loss	Reversible	
			Layout Proposal			Site	Incidental	Low	Improbable	Low	High		High	Low	No Loss	Reversible	
			Layout Alternative			Site	Incidental	Low	Improbable	Low	High		High	Low	No Loss	Reversible	
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	Not Applicable	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Waste Generation	Negative	Domestic waste	Sewer Proposal	Yes	Direct	Local	Long-term	Low-Medium	Definite	Medium	High	<ul style="list-style-type: none"> There is no difference between the proposed and alternative sewer line in terms of domestic waste. However with the alternative layout, road users may through litter when using Road B and therefore contribute to domestic waste. The proposed layout is therefore preferred. Recyclable waste streams must be separated from other waste streams. Waste to be separated into recyclable and non-recyclable waste. Waste separation needs to occur before waste is collected. Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable. All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site if no municipal services are available. Avoidance, reduction, re-use and recycling should be practiced wherever possible. 	Medium	Low	No Loss	Reversible
				Sewer Alternative 1			Local	Long-term	Low-Medium	Definite	Medium	High		Medium	Low	No Loss	Reversible
Layout Proposal				Local			Long-term	Low-Medium	Definite	Medium	High	Medium		Low	No Loss	Reversible	
Layout Alternative				Local			Long-term	Medium	Definite	Medium	High	Medium		Low	No Loss	Reversible	
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Not Applicable		Construction waste	Sewer Proposal	Not Applicable	Not Applicable	None	None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable	
			Sewer Alternative 1			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
			Layout Proposal			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
			Layout Alternative			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
			No-Go Option			None	None	None	None	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
Negative		Hazardous waste	Sewer Proposal	Not Applicable	Not Applicable	None	None	None	None	None	High	No hazardous waste is expected during operation.	Not Applicable	None	Not Applicable	Not Applicable	
			Sewer Alternative 1			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
			Layout Proposal			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
			Layout Alternative			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
			No-Go Option			None	None	None	None	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
			Sewer Proposal			None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	

	IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)				
	Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility				
Soil Alteration	Negative	Loss of topsoil	Sewer Alternative 1	Not Applicable	Not Applicable	None	None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable				
			Layout Proposal			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable				
			Layout Alternative			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable				
			No-Go Option			Yes	Direct	Site	Long-term	Low-Medium	Definite		Low-Medium	High	The site is highly degraded by historic land use. It is likely that there will be a continued loss of topsoil should the development not proceed as the site will remain in its degraded state.	None	Low-Medium	Partial	High Degree	
	Not Applicable	Loss of land capability	Sewer Proposal	Not Applicable	Not Applicable	None	None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	None	None	No Loss	Reversible				
			Sewer Alternative 1			None	None	None	None	None	High		None	None	No Loss	Reversible				
			Layout Proposal			None	None	None	None	None	High		None	None	No Loss	Reversible				
			Layout Alternative			None	None	None	None	None	High		None	None	No Loss	Reversible				
	Not Applicable	Alteration of topography	Sewer Proposal	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	None	None	Not Applicable	Not Applicable				
			Sewer Alternative 1			None	None	None	None	None	High		None	None	No Loss	Reversible				
			Layout Proposal			None	None	None	None	None	High		None	None	No Loss	Reversible				
			Layout Alternative			None	None	None	None	None	High		None	None	No Loss	Reversible				
	Not Applicable	Alteration of topography	No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	None	None	Not Applicable	Not Applicable				
			Sewer Proposal			None	None	None	None	None	High		None	None	No Loss	Reversible				
			Sewer Alternative 1			None	None	None	None	None	High		None	None	No Loss	Reversible				
			Layout Proposal			None	None	None	None	None	High		None	None	No Loss	Reversible				
Negative	Soil pollution	Layout Alternative	Not Applicable	Not Applicable	None	None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	None	None	No Loss	Reversible					
		No-Go Option			None	None	None	None	None	High		None	None	No Loss	Reversible					
		Sewer Proposal			None	None	None	None	None	High		None	None	No Loss	Reversible					
		Sewer Alternative 1			None	None	None	None	None	High		None	None	No Loss	Reversible					
Resource Consumption	Negative	Electricity consumption	Sewer Proposal	Yes	Direct	Local	Long-term	Low-Medium	Definite	Medium	High	• Promote effective electricity consumption. In terms of energy usage, there is no difference between the sewer line alternatives. However, the proposed layout has a lower FAR and thus energy usage will likely be less.	Low	Low-Medium	No Loss	Reversible				
			Sewer Alternative 1			Local	Long-term	Low-Medium	Definite	Medium	High		Low	Low-Medium	No Loss	Reversible				
			Layout Proposal			Local	Long-term	Low-Medium	Definite	Medium	High		Low	Low-Medium	No Loss	Reversible				
			Layout Alternative			Local	Long-term	Medium	Definite	Medium	High		Low	Low-Medium	No Loss	Reversible				
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Water consumption	Sewer Proposal	Yes	Direct	Local	Long-term	Low-Medium	Definite	Medium	High	• Promote effective water conservation measures. In terms of water consumption, there is no difference between the sewer line alternatives. However, the proposed layout has a lower FAR and thus energy usage will likely be less.	Medium	Low	No Loss	Reversible				
			Sewer Alternative 1			Local	Long-term	Low-Medium	Definite	Medium	High		Medium	Low	No Loss	Reversible				
			Layout Proposal			Local	Long-term	Low-Medium	Definite	Medium	High		Medium	Low	No Loss	Reversible				
			Layout Alternative			Local	Long-term	Medium	Definite	Medium	High		Medium	Low	No Loss	Reversible				
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Fuel consumption	Sewer Proposal	Not Applicable	Not Applicable	None	None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable				
			Sewer Alternative 1			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable				
			Layout Proposal			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable				
			Layout Alternative			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable				
			No-Go Option			None	None	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Raw materials consumption	Sewer Proposal	Yes	Direct	Local	Incidental	Low-Medium	Definite	Low-Medium	High	• Promote effective use of raw material. In terms of raw material, there is no difference between the sewer line alternatives. However, the proposed layout has a lower FAR and thus energy usage will likely be less.	Low	Low	No Loss	Reversible				
Sewer Alternative 1			Local			Incidental	Low-Medium	Definite	Low-Medium	High	Low		Low	No Loss	Reversible					
Layout Proposal			Local			Incidental	Low-Medium	Definite	Low-Medium	High	Low		Low	No Loss	Reversible					
Layout Alternative			Local			Incidental	Medium	Definite	Low-Medium	High	Low		Low	No Loss	Reversible					
No-Go Option			Not Applicable			Not Applicable	None	None	None	None	None		None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Effects on Biodiversity	Negative	Loss of existing habitat due to loss of vegetation - stochastic events like fire	Sewer Proposal	No	Direct	Site	Incidental	Medium	Likely	Low	High	Fire extinguishers must be placed on the property.	Medium	Low	No Loss	Reversible				
			Sewer Alternative 1			Site	Incidental	Medium	Likely	Low	High		Medium	Low	No Loss	Reversible				
			Layout Proposal			Site	Incidental	Medium	Likely	Low	High		Medium	Low	No Loss	Reversible				
			Layout Alternative			Site	Incidental	Medium	Likely	Low	High		Medium	Low	No Loss	Reversible				
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
			Sewer Proposal			Site	Incidental	Low	Improbable	Low	High		Medium	Low	No Loss	Reversible				
	Negative	Loss of fauna - Intentional killing of fauna	Sewer Alternative 1	No	Direct	Site	Incidental	Low	Improbable	Low	High	It is not expected that any fauna will be found on site during operation. The Body Corporate must include the requirement in their rule book that should any be found that the relevant organisation be called to safely remove the species.	Medium	Low	No Loss	Reversible				
			Layout Proposal			Site	Incidental	Low	Improbable	Low	High		Medium	Low	No Loss	Reversible				
			Layout Alternative			Site	Incidental	Low	Improbable	Low	High		Medium	Low	No Loss	Reversible				
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
			Sewer Proposal			Site	Permanent	Low	Highly Likely	Low-Medium	High		Stormwater infrastructure should be designed in such a way that it will have minimal impact on the environmental, especially the wetland area. Maintenance should be undertaken as per the requirements of the stormwater management plan. Due to the fact that the proposed layout has a reduced FAR, the full extent of Road B is not required and thus the impact is reduced. The alternative layout is not preferred.	Medium	Low	No Loss	Reversible			
			Sewer Alternative 1			Site	Permanent	Low	Highly Likely	Low-Medium	High			Medium	Low	No Loss	Reversible			
Layout Proposal	Site	Permanent	Low	Highly Likely	Low-Medium	High	Medium	Low	No Loss	Reversible										
Layout Alternative	Site	Permanent	Medium-High	Highly Likely	Medium	High	Medium	Low-Medium	No Loss	Reversible										
No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	None	High	None required	Not Applicable	None		Not Applicable	Not Applicable					
Sewer Proposal	Neighbouring	Incidental	Low-Medium	Possible	Low	High	Low	Low	No Loss	Reversible										

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Incidents, accidents and potential emergency situations	Negative	Pollution incidents	Sewer Alternative 1	No	Direct	Neighbouring	Incidental	Low-Medium	Possible	Low	High	Sewer connection pipe must be managed and maintained in line with Mogale's requirements.	Low	Low	No Loss	Reversible
		Layout Proposal	Neighbouring			Incidental	Low-Medium	Possible	Low	High	Low		Low	No Loss	Reversible	
		Layout Alternative	Neighbouring			Incidental	Low-Medium	Possible	Low	High	Low		Low	No Loss	Reversible	
		No-Go Option	Not Applicable			Not Applicable	None	None	None	None	None		None	High	None required	Not Applicable
	Negative	Health and safety	Sewer Proposal	No	Direct	Site	Incidental	Low-Medium	Possible	Low	High	24 hour security and access control.	Low	Low	No Loss	Reversible
			Sewer Alternative 1			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible
			Layout Proposal			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible
			Layout Alternative			Site	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Storage of hydrocarbons	Sewer Proposal	No	Direct	None	None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable
			Sewer Alternative 1			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable
			Layout Proposal			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable
			Layout Alternative			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable
			No-Go Option	Not Applicable	Not Applicable	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Fire	Sewer Proposal	No	Direct	Neighbouring	Incidental	Low-Medium	Possible	Low	High	Adhere to the appropriate emergency procedures Firefighting equipment must be accessible on site at all times. Display of emergency numbers	Low	Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Incidental	Low-Medium	Possible	Low	High		Low	Low	No Loss	Reversible
Layout Proposal			Neighbouring			Incidental	Low-Medium	Possible	Low	High	Low		Low	No Loss	Reversible	
Layout Alternative			Neighbouring			Incidental	Low-Medium	Possible	Low	High	Low		Low	No Loss	Reversible	
No-Go Option			Neighbouring			Incidental	Low-Medium	Possible	Low	High	Low		Low	No Loss	Reversible	
			Not Applicable	Not Applicable	None	None	None	None	High	The site is currently unoccupied. Should the develop not take place, the potential for fires on site and on neighbouring properties remains as is.	None	Low	No Loss	Reversible		
Social	Negative	Visual impact	Sewer Proposal	No	Direct	Neighbouring	Long-term	Low	Improbable	Low	High	As the development is in line with the development goals of the area, no mitigation measures are required or recommended.	None	Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Long-term	Low	Improbable	Low	High		None	Low	No Loss	Reversible
			Layout Proposal			Neighbouring	Long-term	Low	Improbable	Low	High		None	Low	No Loss	Reversible
			Layout Alternative			Neighbouring	Long-term	Low	Improbable	Low	High		None	Low	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable
	Positive	Safety and security	Sewer Proposal	No	Direct	Neighbouring	Long-term	Low-Medium	Likely	+Low	High	Due to the development of the site, safety and security in the area is likely to improve. In addition, the following will be implemented which will assist with this: 24 hour access control to the site and 24 hour security.	Low	+Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Long-term	Low-Medium	Likely	+Low	High		Low	+Low	No Loss	Reversible
			Layout Proposal			Neighbouring	Long-term	Low-Medium	Likely	+Low	High		Low	+Low	No Loss	Reversible
			Layout Alternative			Neighbouring	Long-term	Low-Medium	Likely	+Low	High		Low	+Low	No Loss	Reversible
	Negative		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	High	The site is currently unoccupied. Should the develop not take place, there may be further safety and security issues in the area.	None	Low	No Loss	Reversible	
Negative	Traffic disruptions	Sewer Proposal	No	Direct	Neighbouring	Long-term	Low-Medium	Definite	Low-Medium	High	As part of the proposed layout, Road A, small section of Road B, intersection upgrades and Access road to be put in place as discussed in the TIA to be implemented. This will ensure that there is no impact to traffic during operation.	High	Low	No Loss	Reversible	
		Sewer Alternative 1			Neighbouring	Long-term	Low-Medium	Definite	Low-Medium	High		High	Low	No Loss	Reversible	
		Layout Proposal			Neighbouring	Long-term	Low-Medium	Definite	Low-Medium	High		High	Low	No Loss	Reversible	
		Layout Alternative			Neighbouring	Long-term	Low-Medium	Definite	Low-Medium	High		High	Low	No Loss	Reversible	
		No-Go Option			Not Applicable	Not Applicable	None	None	None	None		None	High	None required	Not Applicable	None
		Sewer Proposal			None	None	None	None	High	Impacts not applicable to the operational phase. No mitigation required.	None	None	No Loss	Reversible		
		Sewer Alternative 1			None	None	None	None	High		None	None	No Loss	Reversible		

IMPACTS					CONSEQUENCE			PROBABILITY	RANKING WITHOUT MITIGATION	CONFIDENCE IMPLEMENTATION OF MANAGEMENT MEASURES				RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)	
Nature	Description	Alternative	Cumulative	Type	Extent (A)	Duration (B)	Intensity (C)	Probability (P)	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Not Applicable	heritage	Layout Proposal	Not Applicable	Not Applicable	None	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
		Layout Alternative			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
		No-Go Option			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Loss of sense of place	Sewer Proposal	No	Direct	Neighbouring	Long-term	Low	Improbable	Low	High	Impacts to sense of place are not expected, due to the extensive developments that already occur in the area. As the development is in line with the development goals of the area, no mitigation measures are required or recommended.	None	Low	No Loss	Reversible
			Sewer Alternative 1			Neighbouring	Long-term	Low	Improbable	Low	High		None	Low	No Loss	Reversible
			Layout Proposal			Neighbouring	Long-term	Low	Improbable	Low	High		None	Low	No Loss	Reversible
			Layout Alternative			Neighbouring	Long-term	Low	Improbable	Low	High		None	Low	No Loss	Reversible
			No-Go Option			None	None	None	None	None	High		Not Applicable	None	Not Applicable	Not Applicable
	Positive	Change of land use	Sewer Proposal	No	Direct	Site	Permanent	Low-Medium	Definite	+ Medium	High	A Townplanning process is currently being undertaken to change the land use associated with the site. The proposed change in land use is in line with the Muldersdrift Precinct Plan. No mitigation measures other than the townplanning process is required.	Low	+ Medium	No Loss	Reversible
			Sewer Alternative 1			Site	Permanent	Low-Medium	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
			Layout Proposal			Site	Permanent	Low-Medium	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
			Layout Alternative			Site	Permanent	Low-Medium	Definite	+ Medium	High		Low	+ Medium	No Loss	Reversible
	N/A		No-Go Option	Not Applicable	Not Applicable	None	None	None	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Economic	Positive	Decline/increase in economy	Yes	Direct	Local	Long-term	Low-Medium	Definite	+ Medium	High	Once operational the development will provide will contribute to the economy as it will provide business and commercial space. This will have an economic multiplier effect in the local community. No mitigation measures are required. Whilst the proposed layout does provide a lower FAR, and therefore reduces the development capacity, it is not expected that there will be a significant difference between the layout and proposed alternative.	None	+ Medium-High	No Loss	Reversible
						Local	Long-term	Low-Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible
Local						Long-term	Low-Medium	Definite	+ Medium	High	None		+ Medium-High	No Loss	Reversible	
Local						Long-term	Low-Medium	Definite	+ Medium	High	None		+ Medium	No Loss	Reversible	
Negative			No-Go Option	Local	Long-term	Medium	Definite	Medium	High	None	Medium	Partial	High Degree			
Positive		Decline/increase in property value	No	Direct	Neighbouring	Permanent	Medium	Definite	+ Medium	High	The development of the site and services will increase the property value of the site overall. Further, it will have a knock on effect and is likely to increase the value of neighbouring properties as well. No mitigation measures are required.	None	+ Medium	No Loss	Reversible	
					Neighbouring	Permanent	Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible	
					Neighbouring	Permanent	Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible	
					Neighbouring	Permanent	Medium	Definite	+ Medium	High		None	+ Medium	No Loss	Reversible	
Negative		No-Go Option	Neighbouring	Long-term	Medium	Definite	Medium	High	None	Medium	No Loss	Reversible				
Positive		Employment	Yes	Direct	Local	Short-term	Medium-High	Definite	+ Medium	None	The proposed development will result in approximately 100 permanent full time operation related employment opportunities for the local community. Local labour should be utilised as far as possible.	None	+ Medium	No Loss	Reversible	
					Local	Short-term	Medium-High	Definite	+ Medium	None		None	+ Medium	No Loss	Reversible	
					Local	Short-term	Medium-High	Definite	+ Medium	None		None	+ Medium	No Loss	Reversible	
					Local	Short-term	Medium-High	Definite	+ Medium	None		None	+ Medium	No Loss	Reversible	
			Negative	No-Go Option	Local	Long-term	Medium	Definite	Medium	None	None	Medium	No Loss	Reversible		