

APPENDIX F – COMPLETE IMPACT ASSESSMENT

According to Appendix 1 (3) of the EIA Regulations (GN R.982 of 2014), a Basic Assessment Report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—

- (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated;
- (viii) the possible mitigation measures that could be applied and level of residual risk;
- (j) an assessment of each identified potentially significant impact and risk, including
 - (i) cumulative impacts;
 - (ii) the nature, significance and consequences of the impact and risk;
 - (iii) the extent and duration of the impact and risk;
 - (iv) the probability of the impact and risk occurring;
 - (v) the degree to which the impact and risk can be reversed;
 - (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
 - (vii) the degree to which the impact and risk can be avoided, managed or mitigated;

This appendix provides a summary of the key findings, impact assessments and recommended mitigation measures identified for the Dwarsrug access road Basic Assessment project and includes Specialist findings where applicable.

Table 1: Impact and mitigations associated with the Construction Phase: Alternative 1 (preferred alternative)

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
GENERAL						
2.1	<p>Poor Stormwater management</p> <p>During the construction phase, unsuitable road design will have an impact on stormwater at the site.</p>	<p>Direct impacts: Unsuitable road design may cause traffic safety risks due to insufficient storm water drainage planning.</p>	NONE	<p>Extent: Study area (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (30) MEDIUM -</p>	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (3) Probability: Improbable (2) Reversibility: High Significance: (14) LOW -</p>	<ul style="list-style-type: none"> » Storm water management plans must be compiled by an engineer approved by DEA, DWS and the ECO for the project. » All stormwater structures must comply with DWS and SANRAL requirements. » The road engineer must ensure that suitable stormwater structures are included in the road design in order to minimise erosion and sedimentation of watercourses.
		<p>Indirect impacts: Unsuitable road design may lead to increased levels of erosion, sedimentation and pollution of the water courses.</p>		<p>Extent: Surrounding area (2) Duration: Medium term (4) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (36) MEDIUM -</p>	<p>Extent: Local (1) Duration: Medium term (2) Magnitude: Low (4) Probability: Improbable (2) Reversibility: High Significance: (14) LOW -</p>	
		<p>Cumulative impacts: Unsuitable road design and erosion impacts may aggravate sedimentation into local drainage lines and rivers.</p>		<p>Extent: Surrounding area (2) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (33) MEDIUM -</p>	<p>Extent: Local (1) Duration: Medium term (2) Magnitude: Minor (3) Probability: Improbable (1) Reversibility: High Significance: (6) LOW -</p>	
2.1	<p>Noise Impacts:</p> <p>Impacts from increased noise levels will occur during construction of the proposed activity.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Increased noise levels by machinery during the construction of the road. 	NONE	<p>Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: High</p>	<p>Extent: Local (1) Duration: Short term (1) Magnitude: Minor (3) Probability: Probable (3) Reversibility: High</p>	<ul style="list-style-type: none"> » Machinery and equipment are to be switched off when not used. » Construction activities should take place during work hours, these are to be known and agreed upon with all contractors. » Retro-fit some equipment with dampening measures » All labourers to wear PPE

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Significance: (24) LOW-	Significance: (15) LOW-	
		<i>Indirect impacts:</i> None anticipated	-	-	-	
		<i>Cumulative impacts:</i> None anticipated	-	-	-	
2.2	Increased sedimentation, contamination of soils and soil erosion: Increase in sedimentation and erosion within the development area as a result of frequent movements of machinery and clearing of vegetation is expected to occur.	Direct impacts: <ul style="list-style-type: none"> » Frequent movement of heavy machinery may lead to the compaction of soils. » Compaction will lead to increased runoff and removal of vegetation » Disturbance and removal of soils may lead to erosion. » Soils may become contaminated by hydrocarbons leaking from construction equipment and machinery. 	NONE	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (24) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High Significance: (18) LOW-	<ul style="list-style-type: none"> » All soils compacted as a result of construction activities should be profiled and monitored to ensure establishment of natural vegetation. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the construction phase. » Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. » A road/civil engineer must ensure that stormwater structures are included in the road design, in order to minimise erosion. » All stormwater structures must be designed to comply with DWS and SANRAL requirements.
		Indirect impacts: Compaction will lead to increased runoff and removal of vegetation	-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Medium Significance: (24) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (3) Probability: Probable (3) Reversibility: Medium Significance: (15) LOW-	
		Cumulative impacts: Valuable topsoil losses, sedimentation and soil erosion.		Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (24) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High Significance: (18) LOW-	
2.3	Dust generation Dust generated by clearing and of vegetation and earthworks will impact on air quality in the vicinity of the site as well as impede photosynthesis and	Direct impacts: <ul style="list-style-type: none"> » Dust generation will affect air quality in the vicinity of the site as well as respiration of plants. 	NONE	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Highly Probable (3) Reversibility: High	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High	<ul style="list-style-type: none"> » Dust suppression methods should be undertaken during clearing, such as sprinkling and wind breaks. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the construction phase. » Dust generation must comply with the National Dust Control Regulations (GN No. R. 827) of 1 November 2013, promulgated in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	respiration of plants on the project site.			Significance: (24) LOW-	Significance: (18) LOW-	» Limit vegetation clearing as far as possible.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
2.4	Traffic impacts During construction, an increase in construction vehicles will increase traffic in the vicinity of the project site.	Direct impacts: » More construction vehicles will be utilising the Granaatboskolk road.		Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (7) Probability: Definite (3) Reversibility: Medium Significance: (27) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	» Where possible, heavy vehicle traffic should be discouraged from using roads during peak traffic hours. » Road signs and speed limits should be adhered to at all times. » Transport of material and waste should comply with the necessary road regulations.
		Indirect impacts: None anticipated		-	-	
		Cumulative impacts: The construction vehicles that will be using the Granaatboskolk road will place additional pressure on the roads in the area.	-	Extent: Local (2) Duration: Short term (1) Magnitude: Moderate (7) Probability: Definite (3) Reversibility: Medium Significance: (30) MEDIUM-	Extent: Local (2) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: High Significance: (27) LOW-	
2.5	Safety and health Impacts: Safety and security impacts are expected to occur during the construction of an access road	Direct impacts: Negative health impacts on the health of construction workers.		Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Improbable (1) Reversibility: Medium Significance: (8) LOW -	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (3) Probability: Improbable (1) Reversibility: Medium Significance: (7) LOW -	» All construction staff must have the appropriate Personal Protective Equipment (PPE) and safety equipment before being allowed to carry construction activities. » The construction staff handling chemicals or hazardous materials must be trained in the use of the substances and the environmental, health and safety consequences of incidents. » Appoint Health, Safety and Environment (HSE) Officer to ensure monitoring of safety conditions during construction activities. » Classify all Hazardous waste and dispose of appropriately. » Adhere to the Occupational Health and Safety Act (OHSA) (Act 85 of 1993).

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
		Indirect impacts: None anticipated				
		Cumulative impacts: None anticipated				
2.6	Social During construction, temporary and medium-term employment will be created.	Direct opportunities: » Employment opportunities for local workers.	NONE	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (4) Reversibility: Medium Significance: (32) MEDIUM+	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (4) Reversibility: Medium Significance: (32) MEDIUM+	» Where possible local labour should be utilised. » Where possible training schemes should be used.
		Indirect opportunities: The employment opportunities will enable transfer of skills to local people. The local economy will also be stimulated through new employment opportunities created for people.	-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Medium Significance: (12) LOW+	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Medium Significance: (12) LOW+	
		Cumulative impacts: None anticipated	-	-	-	
2.7	Waste storage Improper storage of waste will adversely affect the environment	Direct impacts: Improper storage of waste could lead to contamination and will adversely affect the environment		Extent: Local (1) Duration: Short term (2) Magnitude: Moderate (7) Probability: Probable (3) Reversibility: Medium Significance: (30) MEDIUM-	Extent: Local (1) Duration: Short term (2) Magnitude: Moderate (5) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	» A Waste Management Plan will be required for the site. » Construction waste must be disposed of at a licenced dump/landfill (on a regular basis) » Initiate recycling programmes at the construction site. » The waste management hierarchy must be adopted at the construction site where waste is prevented, if it cannot be prevented it should be minimised. If waste can't be minimised it must be reused or recycled. If this is not an option it should be used for energy recovery. This may involve selling waste to third part recovery organisations. Lastly if energy recovery is not possible waste should be disposal of. » Should waste be stored on site, it cannot be temporarily stored for longer than 80 days.
		Indirect impacts: None anticipated		-	-	
		Cumulative impacts: None anticipated		-	-	
ECOLOGICAL						
2.8	Disturbance and vegetation clearing:	Direct impacts: » Clearing of plants during construction will lead to loss of individuals of plants of SCC.	NONE	Extent: Local (1) Duration: Long-term (4)	Extent: Local (1) Duration: Long-term (4)	» The final route should be subject to a preconstruction walk-through before construction commences and adjusted where required to reduce impacts on SCC and habitats of concern.

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	Impacts on vegetation will occur due to disturbance and vegetation clearing associated with the construction of the access road. In addition, it is possible that some loss of individuals of plants of SCC will occur.			Magnitude: Medium (4) Probability: Certain (5) Reversibility: High (Irreversible) Significance: (45) MEDIUM-	Magnitude: Low (2) Probability: Likely (4) Reversibility: Moderate Significance: (28) LOW-	<ul style="list-style-type: none"> » Search and Rescue of SCCs should be conducted prior to clearing activities. » Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within the demarcated construction areas etc. » All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving is to be allowed once the site has been pegged for construction.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: » The development will contribute to cumulative impacts on habitat loss and transformation in the area.	-	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Certain (5) Reversibility: High (Irreversible) Significance: (45) MEDIUM-	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (2) Probability: Likely (4) Reversibility: Moderate Significance: (28) LOW-	
2.9	Loss of habitat and impacts on local fauna: Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction.	Direct impacts: » Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction.	NONE	Extent: Local (1) Duration: Short-term (1) Magnitude: Medium (4) Probability: Highly probable (4) Reversibility: High (Irreversible) Significance: (24) LOW-	Extent: Local (1) Duration: Short-term (1) Magnitude: Low (34) Probability: Highly probable (4) Reversibility: Moderate Significance: (20) LOW-	<ul style="list-style-type: none"> » Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. » The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the demarcated construction site. » Fires should not be allowed on site. » All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. » All construction vehicles should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.
		Indirect impacts: None anticipated	-			
		Cumulative impacts: During the construction phase the activity would contribute to cumulative fauna disturbance and disruption in the area, but as there are large tracts of intact habitat in the area, it is likely that displaced fauna will have space to move about the site to avoid areas of high activity.		Extent: Local (1) Duration: Short-term (1) Magnitude: Medium (4) Probability: Highly probable (4) Reversibility: Moderate Significance: (24) LOW-	Extent: Local (1) Duration: Short-term (1) Magnitude: Low (34) Probability: Highly probable (4) Reversibility: Moderate Significance: (20) LOW-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
2.10	Soil erosion: Disturbance created during construction will leave the site vulnerable to erosion.	Direct impacts: Disturbance could result in soil erosion.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Probable (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: Low Significance: (12) LOW-	<ul style="list-style-type: none"> » Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. » All roads should have runoff control features which redirects water flow and dissipate any energy in the water that may pose an erosion risk. » Regular monitoring for erosion during construction to ensure that no erosion problems are developing as a result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project. » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » All cleared areas should be revegetated with indigenous perennial species from the local area.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: Erosion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	- - -	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Probable (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: Low Significance: (12) LOW-	
FRESHWATER IMPACTS						
2.11	Vegetation clearance in the watercourse: Vegetation clearance in the riparian habitat and in-stream habitat of the watercourses for the proposed access road. Potential for pioneer and alien invasive species to encroach on watercourses during and after disturbance caused during vegetation clearance.	Direct impacts: Loss of vegetation in the in-stream habitat of the watercourses.		Extent: Immediate area (1) Duration: Medium-term (3) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (40) MEDIUM-	Extent: Immediate area (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (35) MEDIUM-	<ul style="list-style-type: none"> » Vegetation clearance must be limited as far as possible and only within the servitude and course of the proposed access road. No unnecessary clearance is to be undertaken. » Cleared vegetation stockpiles are to be removed as soon as possible to limit disturbance. » No cleared vegetation stockpiles are to be placed in any of the watercourses. » Movement of workers within the watercourse must be limited to the servitude of the road. Workers are not allowed to wonder freely in the watercourse. This will cause unnecessary degradation of the watercourse. » Construction of the access road in the watercourse is to take place preferably in the summer and spring months (September to March) as these are the drier months in which rainfall is likely to be limited. Construction in the autumn and winter months (April to August) is to be avoided as far as possible, as this is when rainfall can be expected and the watercourses are likely to be in flow after rainfall events. » An alien invasive monitoring and control management programme must be compiled to manage encroachment of alien species within the watercourses and along the entire course of the road. Control along the entire route of the access road is required is to ensure that
		Indirect impacts: Pioneer and alien invasive species will possibly encroach on watercourses during and after disturbance caused during vegetation clearance.		Extent: Immediate area (1) Duration: Medium-term (3) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (40) MEDIUM-	Extent: Immediate area (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (35) MEDIUM-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
		<p>Cumulative impacts: None anticipated</p>		-	-	<p>vegetation disturbance is managed and alien vegetation establishment does not take place high or lower along the road route which could result in encroachment on the watercourses at a later stage. Control along the entire access route is also important since catchment level drainage may also result in the dispersion of seeds from alien species into the watercourses should alien establish along the route of the access road outside of the watercourses. Importantly, the alien invasive monitoring and control management programme is also to be implemented post-construction for approximately two (2) years to ensure alien invasives do not encroach following construction.</p>
2.12	<p>Excavation impacts in the watercourse:</p> <p>Clearance of substrate and infill of materials during road construction. Vehicle movement and compaction in the watercourses. Possible soil contamination from vehicle oils and fuels. General erosion impacts to the watercourses.</p>	<p>Direct opportunities: Possible soil erosion and contamination of soils as well as compaction in the watercourses.</p>	NONE	<p>Extent: Local (1) Duration: Short-term (2) Magnitude: Moderate (6) Probability: Definite (5) Reversibility: Moderate Significance: (50) MEDIUM-</p>	<p>Extent: Immediate site (1) Duration: Very short-term (2) Magnitude: Low (6) Probability: Definite (5) Reversibility: Moderate Significance: (30) MEDIUM-</p>	<ul style="list-style-type: none"> » Crossing points must be perpendicular to the watercourses, as far as possible, to prevent the onset of erosion along the length of the watercourse. Aligning the road in parallel will induce a preferential flow path altering the hydrology, which can erode away the substrate along the length of the watercourse, thereby threatening the structural integrity of the geomorphology of the watercourse. Erosion will also cause additional sedimentation impacts. » Ideally, ford crossings are to be implemented through the watercourses for the width and length of the proposed road through the watercourse. The ford crossing should either be concrete based or comprise of geotextile topped with coarse aggregate. Care must be taken when pouring concrete into the watercourses during the construction of the fords, so that no cement is spilt outside of the designated construction area within the watercourse. The ford crossings will have a relatively minimal impact on the hydrology of the watercourses. However, if ford crossings cannot be implemented, any other suitable crossing can be implemented following approval from the Department of Water and Sanitation. » Vehicle movement must be limited as far as possible through watercourses to minimise compaction impacts. » All vehicles and machinery to be used within the watercourses during construction must be checked for oil and fuel leaks before being allowed to cross or work in the watercourses. Should a leak be detected, the vehicle is to be prohibited from working within or crossing through the watercourses until repaired. » Soil stockpiles are to be removed as soon as possible to limit disturbance. » No soil stockpiles are to be placed within 50m of any watercourse. Soil stockpiles within 100m of a watercourse must be bunded with suitable materials (such as bricks or planks), to prevent sedimentation.
		<p>Indirect opportunities: None anticipated</p>	-			
		<p>Cumulative impacts: None anticipated</p>	-	-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
						<ul style="list-style-type: none"> » During construction, silt netting must be erected on the downstream side, along the length of the road crossing, through the watercourse and riparian habitat (as delineated) during the dry season to contain sediment as far as possible. However, the silt nets are to be removed during the autumn and winter months (April to August) should construction need to take place at this time, as the silt nets will act as physical barriers to the watercourses altering the hydrology somewhat, and are likely to be washed away during or after rainfall events. » An appointed environmental control officer (ECO) must monitor the structural integrity of the watercourses when undertaking inspections. Should any erosion be detected, mitigation measures are to be implemented to repair erosion as advised. The environmental control officer must have some experience in erosion rehabilitation to proposed adequate measures, should this be required.
2.13	<p>Decrease in water quality of the watercourses:</p> <p>Water contamination due to vehicle oil and fuel leakages temporary chemical toilets. General sedimentation impacts are anticipated following clearance of vegetation in the watercourses.</p>	<p>Direct impacts: Possible water contamination in the watercourses.</p>		<p>Extent: Local (2) Duration: Medium-term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Moderate</p> <p>Significance: (33) MEDIUM-</p>	<p>Extent: Local (1) Duration: Very short-term (1) Magnitude: Low (2) Probability: Improbable (2) Reversibility: Moderate</p> <p>Significance: (4) LOW-</p>	<ul style="list-style-type: none"> » No fuels, oils or any other hazardous materials are to be brought into the watercourse or stored within 100m from the edge of the watercourses. » During the construction phase, no vehicles are to cross through the watercourses when the watercourses are in flow. Additionally, no work is to take place in the watercourses when in flow. » Temporary chemical sanitation facilities must not be placed in the watercourses. Rather these will need to be placed at least 100m away from the watercourses. » Temporary chemical sanitation facilities must also be checked regularly for maintenance purposes and cleaned often to prevent spills.
		<p>Indirect opportunities: None anticipated</p>		-	-	
		<p>Cumulative impacts: None anticipated</p>		-	-	
HERITAGE						
2.14	<p>Damage of heritage sites:</p> <p>The Stone Age heritage sites could be impacted upon by construction activities.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Construction activities could result in damage to heritage sites. 	NONE	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: Low (4) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (30) MEDIUM-</p>	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: Minor (2) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (24) LOW-</p>	<ul style="list-style-type: none"> » Develop a chance finds protocol for the mitigation of possible heritage finds, to be implemented as part of the EMP for the construction phase of the project. » If any artefacts are identified during construction, the chance finds protocol must be implemented
		<p>Indirect impacts: None anticipated</p>	-	-	-	
		<p>Cumulative impacts: None anticipated</p>	-	-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
2.15	<p>Damage of seal-in fossils:</p> <p>Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface that are then no longer available for scientific study.</p>	<p>Direct impacts: Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface.</p>	NONE	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: High (8) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (42) MEDIUM-</p>	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: Low (4) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (30) MEDIUM-</p>	<ul style="list-style-type: none"> » The EAP as well as the ECO for this project must be made aware of the fact that the Ecca Group sediments contains significant fossil remains, albeit mostly trace fossil assemblages. Several types of fossils have been recorded from this Group in the Karoo Basin of South Africa, with special mention of the very important Whitehill Formation. The Whitehill Formation outcrops are however very restricted in this study area. » In areas that are allocated a Very High and High Palaeontological sensitivity and specifically where deep excavation into bedrock is envisaged (following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to assess and record fossils at specific footprints of infrastructure developments (Phase 1 PIA). » If significant fossil finds (e.g. vertebrate teeth, bones, burrows, petrified wood) are recorded during excavations for infrastructure such as road developments, the palaeontologist must apply for a collection permit to collect the fossils according to the SAHRA specifications.
		<p>Indirect impacts: None anticipated</p>	-	-	-	
		<p>Cumulative impacts: None anticipated</p>	-	-	-	

Table 2: Impact and mitigations associated with the Operation Phase: Alternative 1 (preferred alternative)

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
GENERAL						
2.2	<p>Increased sedimentation, contamination of soils and soil erosion:</p> <p>Increase in sedimentation and erosion due to the access road and the frequent movement of vehicles.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Frequent movement of vehicles may lead to the compaction of soils. » Compaction will lead to increased runoff and removal of vegetation » Disturbance and removal of soils may lead to erosion. » Soils may become contaminated by hydrocarbons leaking from vehicles and trucks using the access road. 	NONE	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Likely (3) Reversibility: Low</p> <p>Significance: (30) MEDIUM-</p>	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Likely (3) Reversibility: Low</p> <p>Significance: (24) LOW-</p>	<ul style="list-style-type: none"> » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. » A road/civil engineer must ensure that stormwater structures are included in the road design, in order to minimise erosion. » All stormwater structures implemented must be designed to comply with DWS and SANRAL requirements.
		<p>Indirect impacts: None anticipated</p>	-	-	-	
		<p>Cumulative impacts: None anticipated</p>	-	-	-	
2.3	<p>Dust generation</p> <p>Dust generated by vehicles will impact on air quality in the vicinity of the</p>	<p>Direct impacts: Dust generation will affect air quality in the vicinity of the site as well as respiration of plants.</p>	NONE	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6)</p>	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4)</p>	<ul style="list-style-type: none"> » Dust suppression methods should be undertaken during clearing, such as sprinkling and wind breaks. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase.

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	site as well as impede photosynthesis and respiration of plants on the project site.			Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	» Dust generation must comply with the National Dust Control Regulations (GN No. R. 827) of 1 November 2013, promulgated in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).
	Indirect impacts: None anticipated	-	-	-		
	Cumulative impacts: None anticipated	-	-	-		
2.4	Traffic impacts During the operational phase, an increase in vehicles will increase traffic in the vicinity of the project site.	Direct impacts: More construction vehicles will be utilising the Granaatboskolk road, this will also be associated with stop and go's where necessary.		Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor(4) Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	» Where possible, heavy vehicle traffic should be discouraged from using roads during peak traffic hours. » Road signs and speed limits should be adhered to at all times. » Transport of material and waste should comply with the necessary road regulations.
	Indirect impacts: None anticipated					
	Cumulative impacts: None anticipated	-	-	-		
2.5	Social During the operational phase, temporary and medium term employment will be created.	Direct opportunities: Employment opportunities for local workers.	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (5) Probability: Probable (4) Reversibility: Low Significance: (36) MEDIUM+	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (5) Probability: Probable (4) Reversibility: Low Significance: (36) MEDIUM+	» Where possible local labour should be utilised. » Where possible training schemes should be used.
	Indirect opportunities: The employment opportunities will enable transfer of skills to local people. The local economy will also be stimulated through new employment opportunities created for people.	-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Low Significance: (12) LOW+	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Low Significance: (12) LOW+		

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
		Cumulative impacts: None anticipated	-	-	-	
2.6	Waste storage Improper storage of waste during the operational phase will adversely affect the environment	Direct impacts: Improper storage of waste could lead to contamination and will adversely affect the environment Indirect impacts: None anticipated Cumulative impacts: None anticipated		Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (7) Probability: Probable (3) Reversibility: Low Significance: (33) MEDIUM-	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	<ul style="list-style-type: none"> » A Waste Management Plan will be required for the site. » Waste generated during the operational phase must be disposed of at a licenced dump/landfill (on a regular basis) » Initiate recycling programmes at the construction site. » The waste management hierarchy must be adopted at the construction site where waste is prevented, if it cannot be prevented it should be minimised. If waste can't be minimised it must be reused or recycled. If this is not an option it should be used for energy recovery, this may involve selling waste to third part recovery organisations. Lastly if energy recovery is not possible waste should be disposal of. » Should waste be stored on site, it cannot be temporarily stored for longer than 80 days.
ECOLOGICAL						
2.7	Impacts on fauna: The road will generate some long-term impact on fauna due to habitat fragmentation as a result of the presence of the road and disturbance and mortality due to collisions with vehicles.	Direct impacts: » Impacts on fauna in and around the site. Indirect impacts: None anticipated Cumulative impacts: The development would contribute to the cumulative disturbance for fauna.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (4) Magnitude: Minor (2) Probability: Probable (4) Reversibility: High Significance: (21) LOW-	<ul style="list-style-type: none"> » All vehicles using the road should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.
2.8	Soil erosion: Disturbance created during construction will leave the site vulnerable to erosion for several years	Direct impacts: The soil erosion created in the construction phase will remain several years into the operational phase.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Likely (4) Reversibility: Low	Extent: Local (1) Duration: Long-term (1) Magnitude: Low (4) Probability: Likely (3) Reversibility: High	<ul style="list-style-type: none"> » Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. » The road should have runoff control features which redirects water flow and dissipate any energy in the water which may pose an erosion risk. » Regular monitoring for erosion during operation to ensure that no erosion problems have developed as result of the disturbance, as

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	into the operational phase.			Significance: (32) MEDIUM-	Significance: (24) LOW-	<p>per the Erosion Management and Rehabilitation Plans for the project.</p> <ul style="list-style-type: none"> » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » There should be follow-up rehabilitation and revegetated of any remaining bare areas with indigenous perennial shrubs and succulents from the local area.
		Indirect impacts: -	-			
		Cumulative impacts: Erosion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.		Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (2) Probability: Probable (3) Reversibility: High Significance: (21) LOW-	
2.9	The site will be vulnerable to the invasion of alien plant species: Disturbance created during construction will leave the site vulnerable to alien plant invasion for several years into the operational phase.	Direct impacts: Disturbance created during construction will leave the site vulnerable to alien plant invasion for several years into the operational phase.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Likely (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (4) Probability: Unlikely (2) Reversibility: High Significance: (16) LOW-	<ul style="list-style-type: none"> » Alien management at the site should take place according to the Alien Invasive Management Plan. » Regular monitoring for alien plant during operation to ensure that no erosion problems have developed as result of the disturbance, as per the Alien Management Plan for the project. » Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: Alien plant invasion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	- - -	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Likely (3) Reversibility: Low Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: High Significance: (12) LOW-	
FRESHWATER IMPACTS						
2.9	Water contamination due to oil, fuel and chemical leakages: Water contamination due to vehicle oil and fuel leakages. General sedimentation impacts are anticipated following clearance of vegetation in	Direct impacts: Water contamination due to vehicle oil and fuel leakages. Sedimentation due to activities in the construction phase will continue for several years into the operational phase.		Extent: Immediate area (1) Duration: Medium-term (3) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate	Extent: Immediate area (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate	<ul style="list-style-type: none"> » No fuels, oils or any other hazardous materials are to be brought into the watercourse or stored within 100m from the edge of the watercourses. » During the operational phase, no vehicles are to cross through the watercourses when the watercourses are in flow.

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	the watercourses, this will continue for several years into the operational phase.			Significance: (40) MEDIUM-	Significance: (35) MEDIUM-	
		Indirect impacts: None anticipated		-	-	
		Cumulative impacts: None anticipated		-	-	
2.10	Vegetation clearance in the watercourse: Vegetation clearance in the riparian habitat and in-stream habitat of the watercourses for the proposed access road. Potential for pioneer and alien invasive species to encroach on watercourses during and after disturbance caused during vegetation clearance in the construction phase will continue for several years into the operational phase.	Direct opportunities: Potential for pioneer and alien invasive species to encroach on watercourses during the operational phase.	NONE	Extent: Local (2) Duration: Medium-term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Moderate Significance: (33) MEDIUM-	Extent: Local (1) Duration: Very short-term (1) Magnitude: Low (2) Probability: Improbable (2) Reversibility: Moderate Significance: (4) LOW-	» An alien invasive monitoring and control management programme must be compiled to manage encroachment of alien species within the watercourses and along the entire course of the road. Control along the entire route of the access road is required to ensure that vegetation disturbance is managed and alien vegetation establishment does not take place high or lower along the road route which could result in encroachment on the watercourses at a later stage. Control along the entire access route is also important since catchment level drainage may also result in the dispersion of seeds from alien species into the watercourses should alien establish along the route of the access road outside of the watercourses. Importantly, the alien invasive monitoring and control management programme is also to be implemented post-construction for approximately two (2) years to ensure alien invasives do not encroach following construction.
		Indirect impacts: None anticipated	-			
		Cumulative impacts: None anticipated	-	-	-	
HERITAGE						
2.12	Damage of heritage sites: The Stone Age heritage sites could be impacted upon during the operational phase.	Direct impacts: » Construction activities could result in damage to heritage sites.	NONE	Extent: Low (1) Duration: Permanent (5) Magnitude: Low (4) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Low (1) Duration: Permanent (5) Magnitude: Minor (2) Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	» Develop a chance finds protocol for the mitigation of possible heritage finds, to be implemented as part of the EMP for the operational phase of the project. » If any artefacts are identified during the operational, the chance finds protocol must be implemented
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
2.13	Damage of seal-in fossils:	Direct impacts:	NONE	Extent: Low (1) Duration: Permanent (5)	Extent: Low (1) Duration: Permanent (5)	» The EAP as well as the ECO for this project must be made aware of the fact that the Ecca Group sediments contains significant fossil

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface that are then no longer available for scientific study.	<ul style="list-style-type: none"> » Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface. 		Magnitude: High (8) Probability: Probable (3) Reversibility: Low Significance: (42) MEDIUM-	Magnitude: Low (4) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	<p>remains, albeit mostly trace fossil assemblages. Several types of fossils have been recorded from this Group in the Karoo Basin of South Africa, with special mention of the very important Whitehill Formation. The Whitehill Formation outcrops are however very restricted in this study area.</p> <ul style="list-style-type: none"> » If significant fossil finds (e.g. vertebrate teeth, bones, burrows, petrified wood) are recorded during excavations for infrastructure such as road developments, the palaeontologist must apply for a collection permit to collect the fossils according to the SAHRA specifications.
		Indirect impacts: None anticipated	-			
		Cumulative impacts: None anticipated				

Table 3: Impact and mitigations associated with the Decommissioning Phase: Alternative 1 (preferred alternative)

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
GENERAL						
2.2	Increased sedimentation, contamination of soils and soil erosion: Increase in sedimentation and erosion due to the access road and the frequent movement of vehicles.	Direct impacts: <ul style="list-style-type: none"> » Frequent movement of vehicles may lead to the compaction of soils. » Compaction will lead to increased runoff and removal of vegetation » Disturbance and removal of soils may lead to erosion. » Soils may become contaminated by hydrocarbons leaking from vehicles and trucks using the access road. 	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Likely (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Likely (3) Reversibility: Low Significance: (24) LOW-	<ul style="list-style-type: none"> » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. » A road/civil engineer must ensure that stormwater structures are included in the road design, in order to minimise erosion. » All stormwater structures implemented must be designed to comply with DWS and SANRAL requirements.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated		-	-	
2.3	Dust generation Dust generated by vehicles will impact on air quality in the vicinity of the site as well as impede photosynthesis and	Direct impacts: Dust generation will affect air quality in the vicinity of the site as well as respiration of plants.	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Low	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Probable (3) Reversibility: Low	<ul style="list-style-type: none"> » Dust suppression methods should be undertaken during clearing, such as sprinkling and wind breaks. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Dust generation must comply with the National Dust Control Regulations (GN No. R. 827) of 1 November 2013, promulgated in

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	respiration of plants on the project site.			Significance: (30) MEDIUM-	Significance: (24) LOW-	terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
ECOLOGICAL						
2.7	Disturbance of fauna: The decommissioning of the facility may lead to disturbance or persecution of fauna within or the areas adjacent to the facility.	Direct impacts: » Impacts on fauna in and around the site.	NONE	Extent: Local (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Probable (3) Reversibility: Moderate Significance: (21) LOW-	Extent: Local (1) Duration: Short-term (2) Magnitude: Minor (2) Probability: Probable (3) Reversibility: High Significance: (15) LOW-	<ul style="list-style-type: none"> » Any potentially dangerous fauna such as snakes or fauna threatened by the decommissioning activities should be removed to a safe location. » The collection, hunting or harvesting of any plants or animals at the site or in the surrounding areas should be strictly forbidden. » All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. » All vehicles accessing the site should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: The development would contribute to the cumulative disturbance for fauna.	-	Extent: Local (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Probable (3) Reversibility: Moderate Significance: (21) LOW-	Extent: Local (1) Duration: Short-term (2) Magnitude: Minor (2) Probability: Probable (3) Reversibility: High Significance: (15) LOW-	
2.8	Soil erosion: Decommissioning of the site will leave the site vulnerable to soil erosion from earthwork (levelling), which may be accelerated for a short period until vegetation settles.	Direct impacts: The soil erosion from earthwork (levelling) may be accelerated for a short period until vegetation settles and embankment reshaping and levelling has been completed.	NONE	Extent: Local (1) Duration: Short-term (2) Magnitude: Medium (4) Probability: Probable (4) Reversibility: High Significance: (28) LOW-	Extent: Local (1) Duration: Short-term (2) Magnitude: Minor (3) Probability: Improbable (3) Reversibility: High Significance: (18) LOW-	<ul style="list-style-type: none"> » Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. » Regular monitoring for erosion after decommissioning for at least 5 years to ensure that no erosion problems have developed as a result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project. » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » All cleared areas resulting from decommissioning should be revegetated with indigenous perennial species from the local area.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts:	-	-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
		None anticipated				
2.9	<p>The site will be vulnerable to the invasion of alien plant species:</p> <p>Disturbance created during decommissioning will leave the site vulnerable to alien plant invasion for several years after site clearing and decommissioning.</p>	<p>Direct impacts: Disturbance created during construction will leave the site vulnerable to alien plant invasion for several years into the operational phase.</p>	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Likely (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (4) Probability: Unlikely (2) Reversibility: High Significance: (16) LOW-	<ul style="list-style-type: none"> » Alien management at the site should take place according to the Alien Invasive Management Plan. » Regular monitoring for alien plant invasion following decommissioning to ensure that no erosion problems have developed as result of the disturbance, as per the Alien Management Plan for the project. » Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present. Follow-up monitoring should occur for at least 5 years after decommissioning.
		<p>Indirect impacts: None anticipated</p>	-	-	-	
		<p>Cumulative impacts: Alien plant invasion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.</p>	- - -	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Likely (3) Reversibility: Low Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: High Significance: (12) LOW-	

Table 4: Impact and mitigations associated with the Construction Phase: Alternative 2

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
GENERAL						
2.1	<p>Poor Stormwater management</p> <p>During the Construction phase, unsuitable road design will have an impact on stormwater at the site.</p>	<p>Direct impacts: Unsuitable road design may cause traffic safety risks due to insufficient storm water drainage planning.</p>	NONE	<p>Extent: Study area (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (30) MEDIUM -</p>	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (3) Probability: Improbable (2) Reversibility: High Significance: (14) LOW -</p>	<ul style="list-style-type: none"> » Storm water management plans must be compiled by an engineer approved by DEA, DWS and the ECO for the project. » All stormwater structures must comply with DWS and SANRAL requirements. » The road engineer must ensure that suitable stormwater structures are included in the road design in order to minimise erosion and sedimentation of watercourses.
		<p>Indirect impacts: Unsuitable road design may lead to increased levels of erosion, sedimentation and pollution of the water courses.</p>		<p>Extent: Surrounding area (2) Duration: Medium term (4) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (36) MEDIUM -</p>	<p>Extent: Local (1) Duration: Medium term (2) Magnitude: Low (4) Probability: Improbable (2) Reversibility: High Significance: (14) LOW -</p>	
		<p>Cumulative impacts: Unsuitable road design and erosion impacts may aggravate sedimentation into local drainage lines and rivers.</p>		<p>Extent: Surrounding area (2) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (33) MEDIUM -</p>	<p>Extent: Local (1) Duration: Medium term (2) Magnitude: Minor (3) Probability: Improbable (1) Reversibility: High Significance: (6) LOW -</p>	
2.1	<p>Noise Impacts:</p> <p>Impacts from increased noise levels will occur during construction of the proposed activity.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Increased noise levels by machinery during the construction of the road. 	NONE	<p>Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: High</p>	<p>Extent: Local (1) Duration: Short term (1) Magnitude: Minor (3) Probability: Probable (3) Reversibility: High</p>	<ul style="list-style-type: none"> » Machinery and equipment are to be switched off when not used. » Construction activities should take place during work hours, these are to be known and agreed upon with all contractors. » Retro-fit some equipment with dampening measures » All labourers to wear PPE

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Significance: (24) LOW-	Significance: (15) LOW-	
		<i>Indirect impacts:</i> None anticipated	-	-	-	
		<i>Cumulative impacts:</i> None anticipated	-	-	-	
2.2	Increased sedimentation, contamination of soils and soil erosion: Increase in sedimentation and erosion within the development area as a result of frequent movements of machinery and clearing of vegetation is expected to occur.	Direct impacts: <ul style="list-style-type: none"> » Frequent movement of heavy machinery may lead to the compaction of soils. » Compaction will lead to increased runoff and removal of vegetation » Disturbance and removal of soils may lead to erosion. » Soils may become contaminated by hydrocarbons leaking from construction equipment and machinery. 	NONE	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (24) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High Significance: (18) LOW-	<ul style="list-style-type: none"> » All soils compacted as a result of construction activities should be profiled and monitored to ensure establishment of natural vegetation. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the construction phase. » Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. » A road/civil engineer must ensure that stormwater structures are included in the road design, in order to minimise erosion. » All stormwater structures must be designed to comply with DWS and SANRAL requirements.
		Indirect impacts: Compaction will lead to increased runoff and removal of vegetation	-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Medium Significance: (24) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (3) Probability: Probable (3) Reversibility: Medium Significance: (15) LOW-	
		Cumulative impacts: Valuable topsoil losses, sedimentation and soil erosion.		Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Medium Significance: (24) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High Significance: (18) LOW-	
2.3	Dust generation Dust generated by clearing and of vegetation and earthworks will impact on air quality in the vicinity of the site as well as impede photosynthesis and	Direct impacts: <ul style="list-style-type: none"> » Dust generation will affect air quality in the vicinity of the site as well as respiration of plants. 	NONE	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Highly Probable (3) Reversibility: High	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High	<ul style="list-style-type: none"> » Dust suppression methods should be undertaken during clearing, such as sprinkling and wind breaks. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the construction phase. » Dust generation must comply with the National Dust Control Regulations (GN No. R. 827) of 1 November 2013, promulgated in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	respiration of plants on the project site.			Significance: (24) LOW-	Significance: (18) LOW-	» Limit vegetation clearing as far as possible.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
2.4	Traffic impacts During construction, an increase in construction vehicles will increase traffic in the vicinity of the project site.	Direct impacts: » More construction vehicles will be utilising the Granaatboskolk road.		Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (7) Probability: Definite (3) Reversibility: Medium Significance: (27) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	» Where possible, heavy vehicle traffic should be discouraged from using roads during peak traffic hours. » Road signs and speed limits should be adhered to at all times. » Transport of material and waste should comply with the necessary road regulations.
		Indirect impacts: None anticipated		-	-	
		Cumulative impacts: The construction vehicles that will be using the Granaatboskolk road will place additional pressure on the roads in the area.	-	Extent: Local (2) Duration: Short term (1) Magnitude: Moderate (7) Probability: Definite (3) Reversibility: Medium Significance: (30) LOW-	Extent: Local (2) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: High Significance: (27) LOW-	
2.5	Safety and health Impacts: Safety and security impacts are expected to occur during the construction of an access road	Direct impacts: Negative health impacts on the health of construction workers.		Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Improbable (1) Reversibility: Medium Significance: (8) LOW -	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (3) Probability: Improbable (1) Reversibility: Medium Significance: (7) LOW -	» All construction staff must have the appropriate Personal Protective Equipment (PPE) and safety equipment before being allowed to carry construction activities. » The construction staff handling chemicals or hazardous materials must be trained in the use of the substances and the environmental, health and safety consequences of incidents. » Appoint Health, Safety and Environment (HSE) Officer to ensure monitoring of safety conditions during construction activities. » Classify all Hazardous waste and dispose of appropriately. » Adhere to the Occupational Health and Safety Act (OHSA) (Act 85 of 1993).

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
		Indirect impacts: None anticipated				
		Cumulative impacts: None anticipated				
2.6	Social During construction, temporary and medium-term employment will be created.	Direct opportunities: » Employment opportunities for local workers.	NONE	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (4) Reversibility: Medium Significance: (32) MEDIUM+	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (6) Probability: Probable (4) Reversibility: Medium Significance: (32) MEDIUM+	» Where possible local labour should be utilised. » Where possible training schemes should be used.
		Indirect opportunities: The employment opportunities will enable transfer of skills to local people. The local economy will also be stimulated through new employment opportunities created for people.	-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Medium Significance: (12) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Medium Significance: (12) LOW-	
		Cumulative impacts: None anticipated	-	-	-	
2.7	Waste storage Improper storage of waste will adversely affect the environment	Direct impacts: Improper storage of waste could lead to contamination and will adversely affect the environment		Extent: Local (1) Duration: Short term (2) Magnitude: Moderate (7) Probability: Probable (3) Reversibility: Medium Significance: (30) MEDIUM-	Extent: Local (1) Duration: Short term (2) Magnitude: Moderate (5) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	» A Waste Management Plan will be required for the site. » Construction waste must be disposed of at a licenced dump/landfill (on a regular basis) » Initiate recycling programmes at the construction site. » The waste management hierarchy must be adopted at the construction site where waste is prevented, if it cannot be prevented it should be minimised. If waste can't be minimised it must be reused or recycled. If this is not an option it should be used for energy recovery. This may involve selling waste to third part recovery organisations. Lastly if energy recovery is not possible waste should be disposal of. » Should waste be stored on site, it cannot be temporarily stored for longer than 80 days.
		Indirect impacts: None anticipated		-	-	
		Cumulative impacts: None anticipated		-	-	
ECOLOGICAL						
2.8	Disturbance and vegetation clearing:	Direct impacts: » Clearing of plants during construction will lead to loss of individuals of plants of SCC.	NONE	Extent: Local (1) Duration: Long-term (4)	Extent: Local (1) Duration: Long-term (4)	» The final route should be subject to a preconstruction walk-through before construction commences and adjusted where required to reduce impacts on SCC and habitats of concern.

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
	Impacts on vegetation will occur due to disturbance and vegetation clearing associated with the construction of the access road. In addition, it is possible that some loss of individuals of plants of SCC will occur.			Magnitude: Medium (4) Probability: Certain (5) Reversibility: High (Irreversible) Significance: (45) MEDIUM-	Magnitude: Low (2) Probability: Likely (4) Reversibility: Moderate Significance: (28) LOW-	<ul style="list-style-type: none"> » Search and Rescue of SCCs should be conducted prior to clearing activities. » Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within the demarcated construction areas etc. » All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving is to be allowed once the site has been pegged for construction.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: » The development will contribute to cumulative impacts on habitat loss and transformation in the area.	-	-	-	
2.9	Loss of habitat and impacts on local fauna: Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction.	Direct impacts: » Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction.	NONE	Extent: Local (1) Duration: Short-term (1) Magnitude: Moderate (7) Probability: Highly probable (4) Reversibility: High (Irreversible) Significance: (36) MEDIUM-	Extent: Local (1) Duration: Short-term (1) Magnitude: Low (3) Probability: Highly probable (4) Reversibility: Moderate Significance: (20) LOW-	<ul style="list-style-type: none"> » Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. » The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the demarcated construction site. » Fires should not be allowed on site. » All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. » All construction vehicles should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.
		Indirect impacts: -	-			
		Cumulative impacts: During the construction phase the activity would contribute to cumulative fauna disturbance and disruption in the area, but as there are large tracts of intact habitat in the area, it is likely that displaced fauna will have space to move about the site to avoid areas of high activity.		Extent: Local (1) Duration: Short-term (1) Magnitude: Moderate (7) Probability: Highly probable (4) Reversibility: High (Irreversible) Significance: (36) MEDIUM-	Extent: Local (1) Duration: Short-term (1) Magnitude: Low (3) Probability: Highly probable (4) Reversibility: Moderate Significance: (20) LOW-	
2.10	Soil erosion: Disturbance created during construction will leave the site vulnerable to erosion.	Direct impacts: Disturbance could result in soil erosion.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Probable (3) Reversibility: Low	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: Low	<ul style="list-style-type: none"> » Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. » All roads should have runoff control features which redirects water flow and dissipate any energy in the water that may pose an erosion risk. » Regular monitoring for erosion during construction to ensure that no erosion problems are developing as a result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project.

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Significance: (27) LOW-	Significance: (12) LOW-	<ul style="list-style-type: none"> » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » All cleared areas should be revegetated with indigenous perennial species from the local area.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: Erosion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	- - -	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Probable (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: Low Significance: (12) LOW-	
FRESHWATER IMPACTS						
2.11	<p>Vegetation clearance in the watercourse:</p> <p>Vegetation clearance in the riparian habitat and in-stream habitat of the watercourses for the proposed access road. Potential for pioneer and alien invasive species to encroach on watercourses during and after disturbance caused during vegetation clearance.</p>	<p>Direct impacts: Loss of vegetation in the in-stream habitat of the watercourses.</p> <p>Indirect impacts: Pioneer and alien invasive species will possibly encroach on watercourses during and after disturbance caused during vegetation clearance.</p> <p>Cumulative impacts: None anticipated</p>		Extent: Immediate area (1) Duration: Medium-term (3) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (40) MEDIUM-	Extent: Immediate area (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (35) MEDIUM-	<ul style="list-style-type: none"> » Vegetation clearance must be limited as far as possible and only within the servitude and course of the proposed access road. No unnecessary clearance is to be undertaken. » Cleared vegetation stockpiles are to be removed as soon as possible to limit disturbance. » No cleared vegetation stockpiles are to be placed in any of the watercourses. » Movement of workers within the watercourse must be limited to the servitude of the road. Workers are not allowed to wonder freely in the watercourse. This will cause unnecessary degradation of the watercourse. » Construction of the access road in the watercourse is to take place preferably in the summer and spring months (September to March) as these are the drier months in which rainfall is likely to be limited. Construction in the autumn and winter months (April to August) is to be avoided as far as possible, as this is when rainfall can be expected and the watercourses are likely to be in flow after rainfall events. » An alien invasive monitoring and control management programme must be compiled to manage encroachment of alien species within the watercourses and along the entire course of the road. Control along the entire route of the access road is required is to ensure that vegetation disturbance is managed and alien vegetation establishment does not take place high or lower along the road route which could result in encroachment on the watercourses at a later stage. Control along the entire access route is also important since catchment level drainage may also result in the dispersion of seeds from alien species into the watercourses should alien establish along the route of the access road outside of the watercourses.
				Extent: Immediate area (1) Duration: Medium-term (3) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (40) MEDIUM-	Extent: Immediate area (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (35) MEDIUM-	
				-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
						Importantly, the alien invasive monitoring and control management programme is also to be implemented post-construction for approximately two (2) years to ensure alien invasives do not encroach following construction.
2.12	<p>Excavation impacts in the watercourse:</p> <p>Clearance of substrate and infill of materials during road construction. Vehicle movement and compaction in the watercourses. Possible soil contamination from vehicle oils and fuels. General erosion impacts to the watercourses.</p>	<p>Direct opportunities: Possible soil erosion and contamination of soils as well as compaction in the watercourses.</p>	NONE	<p>Extent: Local (1) Duration: Short-term (2) Magnitude: Moderate (6) Probability: Definite (5) Reversibility: Moderate</p> <p>Significance: (50) MEDIUM-</p>	<p>Extent: Immediate site (1) Duration: Very short-term (2) Magnitude: Low (6) Probability: Definite (5) Reversibility: Moderate</p> <p>Significance: (30) MEDIUM-</p>	<ul style="list-style-type: none"> » Crossing points must be perpendicular to the watercourses, as far as possible, to prevent the onset of erosion along the length of the watercourse. Aligning the road in parallel will induce a preferential flow path altering the hydrology, which can erode away the substrate along the length of the watercourse, thereby threatening the structural integrity of the geomorphology of the watercourse. Erosion will also cause additional sedimentation impacts. » Ideally, ford crossings are to be implemented through the watercourses for the width and length of the proposed road through the watercourse. The ford crossing should either be concrete based or comprise of geotextile topped with coarse aggregate. Care must be taken when pouring concrete into the watercourses during the construction of the fords, so that no cement is spilt outside of the designated construction area within the watercourse. The ford crossings will have a relatively minimal impact on the hydrology of the watercourses. However, if ford crossings cannot be implemented, any other suitable crossing can be implemented following approval from the Department of Water and Sanitation. » Vehicle movement must be limited as far as possible through watercourses to minimise compaction impacts. » All vehicles and machinery to be used within the watercourses during construction must be checked for oil and fuel leaks before being allowed to cross or work in the watercourses. Should a leak be detected, the vehicle is to be prohibited from working within or crossing through the watercourses until repaired. » Soil stockpiles are to be removed as soon as possible to limit disturbance. » No soil stockpiles are to be placed within 50m of any watercourse. Soil stockpiles within 100m of a watercourse must be bunded with suitable materials (such as bricks or planks), to prevent sedimentation. » During construction, silt netting must be erected on the downstream side, along the length of the road crossing, through the watercourse and riparian habitat (as delineated) during the dry season to contain sediment as far as possible. However, the silt nets are to be removed during the autumn and winter months (April to August) should construction need to take place at this time, as the silt nets will act as physical barriers to the watercourses altering the hydrology
		<p>Indirect opportunities: None anticipated</p>	-			
		<p>Cumulative impacts: None anticipated</p>	-	-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
						<p>somewhat, and are likely to be washed away during or after rainfall events.</p> <ul style="list-style-type: none"> » An appointed environmental control officer (ECO) must monitor the structural integrity of the watercourses when undertaking inspections. Should any erosion be detected, mitigation measures are to be implemented to repair erosion as advised. The environmental control officer must have some experience in erosion rehabilitation to proposed adequate measures, should this be required.
2.13	<p>Decrease in water quality of the watercourses:</p> <p>Water contamination due to vehicle oil and fuel leakages temporary chemical toilets. General sedimentation impacts are anticipated following clearance of vegetation in the watercourses.</p>	<p>Direct impacts: Possible water contamination in the watercourses.</p>		<p>Extent: Local (2) Duration: Medium-term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Moderate</p> <p>Significance: (33) MEDIUM-</p>	<p>Extent: Local (1) Duration: Very short-term (1) Magnitude: Low (2) Probability: Improbable (2) Reversibility: Moderate</p> <p>Significance: (4) LOW-</p>	<ul style="list-style-type: none"> » No fuels, oils or any other hazardous materials are to be brought into the watercourse or stored within 100m from the edge of the watercourses. » During the construction phase, no vehicles are to cross through the watercourses when the watercourses are in flow. Additionally, no work is to take place in the watercourses when in flow. » Temporary chemical sanitation facilities must not be placed in the watercourses. Rather these will need to be placed at least 100m away from the watercourses. » Temporary chemical sanitation facilities must also be checked regularly for maintenance purposes and cleaned often to prevent spills.
		<p>Indirect opportunities: None anticipated</p>		-	-	
		<p>Cumulative impacts: None anticipated</p>		-	-	
HERITAGE						
2.14	<p>Damage of heritage sites:</p> <p>The Stone Age heritage sites could be impacted upon by construction activities.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Construction activities could result in damage to heritage sites. 	NONE	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: Moderate (7) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (39) MEDIUM-</p>	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (30) MEDIUM-</p>	<ul style="list-style-type: none"> » Develop a chance finds protocol for the mitigation of possible heritage finds, to be implemented as part of the EMP for the construction phase of the project. » If any artefacts are identified during construction, the chance finds protocol must be implemented
		<p>Indirect impacts: None anticipated</p>	-	-	-	
		<p>Cumulative impacts: None anticipated</p>	-	-	-	
2.15	<p>Damage of seal-in fossils:</p> <p>Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface that are then no longer available for scientific study.</p>	<p>Direct impacts: Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface.</p>	NONE	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: High (8) Probability: Probable (3) Reversibility: Low</p>	<p>Extent: Low (1) Duration: Permanent (5) Magnitude: Low (4) Probability: Probable (3) Reversibility: Low</p>	<ul style="list-style-type: none"> » The EAP as well as the ECO for this project must be made aware of the fact that the Ecca Group sediments contains significant fossil remains, albeit mostly trace fossil assemblages. Several types of fossils have been recorded from this Group in the Karoo Basin of South Africa, with special mention of the very important Whitehill Formation. The Whitehill Formation outcrops are however very restricted in this study area. » In areas that are allocated a Very High and High Palaeontological sensitivity and specifically where deep excavation into bedrock is

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Significance: (42) MEDIUM-	Significance: (30) MEDIUM-	<p>envisaged (following the geotechnical investigation), or where fossils are recorded during the geotechnical investigations, a qualified palaeontologist must be appointed to assess and record fossils at specific footprints of infrastructure developments (Phase 1 PIA).</p> <p>» If significant fossil finds (e.g. vertebrate teeth, bones, burrows, petrified wood) are recorded during excavations for infrastructure such as road developments, the palaeontologist must apply for a collection permit to collect the fossils according to the SAHRA specifications.</p>
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	

Table 5: Impact and mitigations associated with the Operation Phase: Alternative 2

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
GENERAL						
2.2	<p>Increased sedimentation, contamination of soils and soil erosion:</p> <p>Increase in sedimentation and erosion due to the access road and the frequent movement of vehicles.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Frequent movement of vehicles may lead to the compaction of soils. » Compaction will lead to increased runoff and removal of vegetation » Disturbance and removal of soils may lead to erosion. » Soils may become contaminated by hydrocarbons leaking from vehicles and trucks using the access road. <p>Indirect impacts: None anticipated</p> <p>Cumulative impacts: None anticipated</p>	NONE	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Likely (3) Reversibility: Low</p> <p>Significance: (30) MEDIUM-</p>	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Likely (3) Reversibility: Low</p> <p>Significance: (24) LOW-</p>	<ul style="list-style-type: none"> » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. » A road/civil engineer must ensure that stormwater structures are included in the road design, in order to minimise erosion. » All stormwater structures implemented must be designed to comply with DWS and SANRAL requirements.
2.3	<p>Dust generation</p> <p>Dust generated by vehicles will impact on air quality in the vicinity of the site as well as impede photosynthesis and respiration of plants on the project site.</p>	<p>Direct impacts: Dust generation will affect air quality in the vicinity of the site as well as respiration of plants.</p> <p>Indirect impacts: None anticipated</p> <p>Cumulative impacts: None anticipated</p>	NONE	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (30) MEDIUM-</p>	<p>Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Probable (3) Reversibility: Low</p> <p>Significance: (24) LOW-</p>	<ul style="list-style-type: none"> » Dust suppression methods should be undertaken during clearing, such as sprinkling and wind breaks. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Dust generation must comply with the National Dust Control Regulations (GN No. R. 827) of 1 November 2013, promulgated in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
2.4	Traffic impacts During the operational phase, an increase in vehicles will increase traffic in the vicinity of the project site.	Direct impacts: More construction vehicles will be utilising the Granaatboskolk road, this will also be associated with stop and go's where necessary.		Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor(4) Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	<ul style="list-style-type: none"> » Where possible, heavy vehicle traffic should be discouraged from using roads during peak traffic hours. » Road signs and speed limits should be adhered to at all times. » Transport of material and waste should comply with the necessary road regulations.
		Indirect impacts: None anticipated				
		Cumulative impacts: None anticipated	-	-	-	
2.5	Social During the operational phase, temporary and medium term employment will be created.	Direct opportunities: Employment opportunities for local workers.	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (5) Probability: Probable (4) Reversibility: Low Significance: (36) MEDIUM+	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (5) Probability: Probable (4) Reversibility: Low Significance: (36) MEDIUM+	<ul style="list-style-type: none"> » Where possible local labour should be utilised. » Where possible training schemes should be used.
		Indirect opportunities: The employment opportunities will enable transfer of skills to local people. The local economy will also be stimulated through new employment opportunities created for people.	-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Low Significance: (12) LOW-	Extent: Local (1) Duration: Short term (1) Magnitude: Moderate (4) Probability: Probable (2) Reversibility: Low Significance: (12) LOW-	
		Cumulative impacts: None anticipated	-	-	-	
2.6	Waste storage Improper storage of waste during the operational phase will adversely affect the environment	Direct impacts: Improper storage of waste could lead to contamination and will adversely affect the environment		Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (7) Probability: Probable (3) Reversibility: Low	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: Low	<ul style="list-style-type: none"> » A Waste Management Plan will be required for the site. » Waste generated during the operational phase must be disposed of at a licenced dump/landfill (on a regular basis) » Initiate recycling programmes at the construction site. » The waste management hierarchy must be adopted at the construction site where waste is prevented, if it cannot be prevented it should be minimised. If waste can't be minimised it must be reused or recycled. If this is not an option it should be used for energy recovery, this may involve selling waste to third part

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Significance: (33) MEDIUM-	Significance: (24) LOW-	recovery organisations. Lastly if energy recovery is not possible waste should be disposal of. » Should waste be stored on site, it cannot be temporarily stored for longer than 80 days.
		Indirect impacts: None anticipated				
		Cumulative impacts: None anticipated				
ECOLOGICAL						
2.7	Impacts on fauna: The road will generate some long-term impact on fauna due to habitat fragmentation as a result of the presence of the road and disturbance and mortality due to collisions with vehicles.	Direct impacts: » Impacts on fauna in and around the site.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (4) Probability: Probable (4) Reversibility: High Significance: (32) MEDIUM-	Extent: Local (1) Duration: Long-term (4) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	» All vehicles using the road should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: The development would contribute to the cumulative disturbance for fauna.	-	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Probable (3) Reversibility: High Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (4) Magnitude: Minor (2) Probability: Probable (4) Reversibility: High Significance: (21) LOW-	
2.8	Soil erosion: Disturbance created during construction will leave the site vulnerable to erosion for several years into the operational phase.	Direct impacts: The soil erosion created in the construction phase will remain several years into the operational phase.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Likely (4) Reversibility: Low Significance: (32) MEDIUM-	Extent: Local (1) Duration: Long-term (1) Magnitude: Low (4) Probability: Likely (3) Reversibility: High Significance: (24) LOW-	» Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. » The road should have runoff control features which redirects water flow and dissipate any energy in the water which may pose an erosion risk. » Regular monitoring for erosion during operation to ensure that no erosion problems have developed as result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project. » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » There should be follow-up rehabilitation and revegetated of any remaining bare areas with indigenous perennial shrubs and succulents from the local area.
		Indirect impacts: -	-			
		Cumulative impacts: Erosion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.		Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3)	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (2)	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	Probability: Probable (3) Reversibility: High Significance: (21) LOW-	
2.9	The site will be vulnerable to the invasion of alien plant species: Disturbance created during construction will leave the site vulnerable to alien plant invasion for several years into the operational phase.	Direct impacts: Disturbance created during construction will leave the site vulnerable to alien plant invasion for several years into the operational phase.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Likely (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (4) Probability: Unlikely (2) Reversibility: High Significance: (16) LOW-	<ul style="list-style-type: none"> » Alien management at the site should take place according to the Alien Invasive Management Plan. » Regular monitoring for alien plant during operation to ensure that no erosion problems have developed as result of the disturbance, as per the Alien Management Plan for the project. » Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: Alien plant invasion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	- - -	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Likely (3) Reversibility: Low Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: High Significance: (12) LOW-	
FRESHWATER IMPACTS						
2.9	Water contamination due to oil, fuel and chemical leakages: Water contamination due to vehicle oil and fuel leakages. General sedimentation impacts are anticipated following clearance of vegetation in the watercourses, this will continue for several years into the operational phase.	Direct impacts: Water contamination due to vehicle oil and fuel leakages. Sedimentation due to activities in the construction phase will continue for several years into the operational phase.		Extent: Immediate area (1) Duration: Medium-term (3) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (40) MEDIUM-	Extent: Immediate area (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Definite (5) Reversibility: Moderate Significance: (35) MEDIUM-	<ul style="list-style-type: none"> » No fuels, oils or any other hazardous materials are to be brought into the watercourse or stored within 100m from the edge of the watercourses. » During the operational phase, no vehicles are to cross through the watercourses when the watercourses are in flow.
		Indirect impacts: None anticipated		-	-	
		Cumulative impacts: None anticipated		-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
2.10	Vegetation clearance in the watercourse: Vegetation clearance in the riparian habitat and in-stream habitat of the watercourses for the proposed access road. Potential for pioneer and alien invasive species to encroach on watercourses during and after disturbance caused during vegetation clearance in the construction phase will continue for several years into the operational phase.	Direct opportunities: Potential for pioneer and alien invasive species to encroach on watercourses during the operational phase.	NONE	Extent: Local (2) Duration: Medium-term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Moderate Significance: (33) MEDIUM-	Extent: Local (1) Duration: Very short-term (1) Magnitude: Low (2) Probability: Improbable (2) Reversibility: Moderate Significance: (4) LOW-	» An alien invasive monitoring and control management programme must be compiled to manage encroachment of alien species within the watercourses and along the entire course of the road. Control along the entire route of the access road is required to ensure that vegetation disturbance is managed and alien vegetation establishment does not take place high or lower along the road route which could result in encroachment on the watercourses at a later stage. Control along the entire access route is also important since catchment level drainage may also result in the dispersion of seeds from alien species into the watercourses should alien establish along the route of the access road outside of the watercourses. Importantly, the alien invasive monitoring and control management programme is also to be implemented post-construction for approximately two (2) years to ensure alien invasives do not encroach following construction.
		Indirect impacts: None anticipated	-			
		Cumulative impacts: None anticipated	-	-	-	
HERITAGE						
2.11	Damage of heritage sites: The Stone Age heritage sites could be impacted upon during the operational phase.	Direct impacts: » Construction activities could result in damage to heritage sites.	NONE	Extent: Low (1) Duration: Permanent (5) Magnitude: Low (4) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Low (1) Duration: Permanent (5) Magnitude: Moderate (4) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	» Develop a chance finds protocol for the mitigation of possible heritage finds, to be implemented as part of the EMP for the operational phase of the project. » If any artefacts are identified during the operational, the chance finds protocol must be implemented
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
2.12	Damage of seal-in fossils: Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface that are then no longer available for scientific study.	Direct impacts: » Disturb, damage, destroy or permanently seal-in fossils at or below the ground surface.	NONE	Extent: Low (1) Duration: Permanent (5) Magnitude: High (8) Probability: Probable (3) Reversibility: Low Significance: (42) MEDIUM-	Extent: Low (1) Duration: Permanent (5) Magnitude: Low (4) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	» The EAP as well as the ECO for this project must be made aware of the fact that the Ecca Group sediments contains significant fossil remains, albeit mostly trace fossil assemblages. Several types of fossils have been recorded from this Group in the Karoo Basin of South Africa, with special mention of the very important Whitehill Formation. The Whitehill Formation outcrops are however very restricted in this study area. » If significant fossil finds (e.g. vertebrate teeth, bones, burrows, petrified wood) are recorded during excavations for infrastructure such as road developments, the palaeontologist must apply for a collection permit to collect the fossils according to the SAHRA specifications.
		Indirect impacts: None anticipated	-			
		Cumulative impacts: None anticipated				

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
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Table 6: Impact and mitigations associated with the Decommissioning Phase: Alternative 2

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
GENERAL						
2.1	Increased sedimentation, contamination of soils and soil erosion: Increase in sedimentation and erosion due to the access road and the frequent movement of vehicles.	Direct impacts: <ul style="list-style-type: none"> » Frequent movement of vehicles may lead to the compaction of soils. » Compaction will lead to increased runoff and removal of vegetation » Disturbance and removal of soils may lead to erosion. » Soils may become contaminated by hydrocarbons leaking from vehicles and trucks using the access road. 	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Likely (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Likely (3) Reversibility: Low Significance: (24) LOW-	<ul style="list-style-type: none"> » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Any erosion problems observed to be associated with the project infrastructure should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur. » A road/civil engineer must ensure that stormwater structures are included in the road design, in order to minimise erosion. » All stormwater structures implemented must be designed to comply with DWS and SANRAL requirements.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated		-	-	
2.2	Dust generation Dust generated by vehicles will impact on air quality in the vicinity of the site as well as impede photosynthesis and respiration of plants on the project site.	Direct impacts: Dust generation will affect air quality in the vicinity of the site as well as respiration of plants.	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	Extent: Local (1) Duration: Medium term (3) Magnitude: Minor (4) Probability: Probable (3) Reversibility: Low Significance: (24) LOW-	<ul style="list-style-type: none"> » Dust suppression methods should be undertaken during clearing, such as sprinkling and wind breaks. » Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads associated with the project during the operation phase. » Dust generation must comply with the National Dust Control Regulations (GN No. R. 827) of 1 November 2013, promulgated in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
ECOLOGICAL						
2.3	Disturbance of fauna: The decommissioning of the facility may lead to disturbance or persecution of fauna within or the areas adjacent to the facility.	Direct impacts: <ul style="list-style-type: none"> » Impacts on fauna in and around the site. 	NONE	Extent: Local (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Probable (3)	Extent: Local (1) Duration: Short-term (2) Magnitude: Minor (2) Probability: Probable (3) Reversibility: High	<ul style="list-style-type: none"> » Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location. » The collection, hunting or harvesting of any plants or animals at the site or in the surrounding areas should be strictly forbidden. » All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
				Reversibility: Moderate Significance: (21) LOW-	Significance: (15) LOW-	and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. » All vehicles accessing the site should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: The development would contribute to the cumulative disturbance for fauna.	-	Extent: Local (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Probable (3) Reversibility: Moderate Significance: (21) LOW-	Extent: Local (1) Duration: Short-term (2) Magnitude: Minor (2) Probability: Probable (3) Reversibility: High Significance: (15) LOW-	
2.4	Soil erosion: Decommissioning of the site will leave the site vulnerable to soil erosion from earthwork (levelling), which may be accelerated for a short period until vegetation settles.	Direct impacts: The soil erosion from earthwork (levelling) may be accelerated for a short period until vegetation settles and embankment reshaping and levelling has been completed.	NONE	Extent: Local (1) Duration: Short-term (2) Magnitude: Medium (4) Probability: Probable (4) Reversibility: High Significance: (28) LOW-	Extent: Local (1) Duration: Short-term (2) Magnitude: Minor (3) Probability: Improbable (3) Reversibility: High Significance: (18) LOW-	» Erosion management at the site should take place according to the Erosion Management Plan and Rehabilitation Plan. » Regular monitoring for erosion after decommissioning for at least 5 years to ensure that no erosion problems have developed as a result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project. » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » All cleared areas resulting from decommissioning should be revegetated with indigenous perennial species from the local area.
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated	-	-	-	
2.5	The site will be vulnerable to the invasion of alien plant species: Disturbance created during decommissioning will leave the site vulnerable to alien plant invasion for several years after site clearing and decommissioning.	Direct impacts: Disturbance created during construction will leave the site vulnerable to alien plant invasion for several years into the operational phase.	NONE	Extent: Local (1) Duration: Long-term (4) Magnitude: Medium (4) Probability: Likely (3) Reversibility: Low Significance: (27) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (4) Probability: Unlikely (2) Reversibility: High Significance: (16) LOW-	» Alien management at the site should take place according to the Alien Invasive Management Plan. » Regular monitoring for alien plant invasion following decommissioning to ensure that no erosion problems have developed as result of the disturbance, as per the Alien Management Plan for the project. » Woody aliens should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present. Follow-up monitoring should occur for at least 5 years after decommissioning.
		Indirect impacts: None anticipated	-	-	-	

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	MITIGATION MEASURES
		Cumulative impacts: Alien plant invasion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	- - -	Extent: Local (1) Duration: Long-term (4) Magnitude: Low (3) Probability: Likely (3) Reversibility: Low Significance: (24) LOW-	Extent: Local (1) Duration: Long-term (3) Magnitude: Low (2) Probability: Unlikely (2) Reversibility: High Significance: (12) LOW-	

Table 7: Impact associated with The No-go option

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	NO MITIGATION MEASURES
GENERAL						
7.1	Access road for the Dwarsrug WEF	Direct impacts: The Dwarsrug WEF will have no access road and this will affect the operation aspect of the WEF.	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Likely (3) Reversibility: Low Significance: (30) MEDIUM-	NA	NA
		Indirect impacts: None anticipated	-	-	-	
		Cumulative impacts: None anticipated		-	-	
7.2	Continuation of current land use	Direct impacts: The farm portion is currently zoned for agricultural use, should this development not be authorised the site will remain unchanged and will continue to be used for agricultural purposes.	NONE	Extent: Local (1) Duration: Short-term (2) Magnitude: Low (4) Probability: Probable (3) Reversibility: Moderate Significance: (21) LOW-	NA	NA

No.	ISSUE	DESCRIPTION OF IMPACT	SIGNIFICANCE NO-GO OPTION	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION	NO MITIGATION MEASURES
		<i>Indirect impacts:</i> None anticipated	-	-	-	
		<i>Cumulative impacts:</i> None anticipated	-	-	-	
7.3	Employment opportunities	<p>Direct impacts:</p> <ul style="list-style-type: none"> » If the proposed development does not materialize, no employment opportunities will be created in the construction of this access road. 	NONE	Extent: Local (1) Duration: Medium term (3) Magnitude: Moderate (6) Probability: Probable (3) Reversibility: Low Significance: (30) MEDIUM-	NA	NA
		<i>Indirect impacts:</i> None anticipated	-	-	-	
		<i>Cumulative impacts:</i>	-			