

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS										
ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (PROBABILITY/ LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	REVERSABILITY/ MITIGATION	SIGNIFICANCE POST-MITIGATION
PLANNING & DESIGN PHASE										
<i>It is important to note that specialist planning and design phase impacts were not expected since the developer designed the layout presented in the BAR on sensitivity data and constraints provided by the various specialists. The planning and design impacts were therefore mitigated at Planning Phase.</i>										
AQUATIC IMPACT ASSESSMENT										
None identified by specialist										
AVIFAUNAL IMPACT ASSESSMENT										
None identified by specialist										
BAT IMPACT ASSESSMENT										
None identified by specialist										
ECOLOGICAL IMPACT ASSESSMENT										
None identified by specialist										
HERITAGE IMPACT ASSESSMENT										
None identified by specialist										
NOISE IMPACT ASSESSMENT										
None identified by specialist										
PALAENTOLOGICAL IMPACT ASSESSMENT										
None identified by specialist										
SOCIAL IMPACT ASSESSMENT										
None identified by specialist										
TRAFFIC IMPACT ASSESSMENT										
None identified by specialist										
VISUAL IMPACT ASSESSMENT										
None identified by specialist										
CONSTRUCTION PHASE										
AGRICULTURAL IMPACT ASSESSMENT										
REDUCTION OF LAND WITH NATURAL VEGETATION FOR LIVESTOCK GRAZING	The availability of grazing land that can be used for small stock farming will be reduced during the construction phase. It is anticipated that the impact will remain as long the infrastructure is present, and the impact will only cease once all surface infrastructure has been decommissioned and vegetation has re-established in these areas.	DIRECT	STUDY AREA	SHORT TERM	DEFINITE	SLIGHT	LOW -	<ul style="list-style-type: none">✦ Vegetation clearance must be restricted to infrastructure and access road areas.✦ Materials and equipment must only be stored in the pre-determined laydown areas.✦ Prior arrangements must be made with the landowner and neighbouring landowners to ensure that farm and game animals are moved to areas where they cannot be injured by vehicles traversing the area.✦ No boundary fence must be opened without the landowner or neighbouring landowners' permission.✦ No open fires made by the construction teams are allowable during the construction phase.✦ The supporting infrastructure must be constructed as closely as possible together to avoid fragmentation of the entire project site.	ACHIEVABLE	LOW -
SOIL EROSION	The clearing and levelling of a limited area of land within the proposed project site will increase the risk of soil erosion in the area. It is anticipated that the risk will naturally reduce as grass and lower shrubs re-establishes in the area once the construction has been completed and the operation phase commences.	DIRECT	STUDY AREA	MEDIUM TERM	POSSIBLE	MODERATE	MODERATE -	<ul style="list-style-type: none">✦ Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude;✦ Unnecessary land clearance must be avoided;✦ Level any remaining soil	ACHIEVABLE	LOW -

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								<i>removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.</i> ✦ Regularly monitor the site to check for areas where signs of soil erosion may start to appear. ✦ Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques		
SOIL EROSION	Any additional wind energy facilities or other renewable projects to be developed in the area, will result in additional areas where exposed to soil erosion through wind and water movement.	CUMULATIVE	REGIONAL	MEDIUM TERM	POSSIBLE	MODERATE	MODERATE -	✦ Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude; ✦ Unnecessary land clearance must be avoided; ✦ Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface. ✦ Regularly monitor the site to check for areas where signs of soil erosion may start to appear. ✦ Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques	ACHIEVABLE	LOW -
SOIL POLLUTION	The following construction activities can result in the chemical pollution of the soil: 1. Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation. 2. Spills from vehicles transporting workers, equipment, and construction material to and from the construction site. 3. The accidental spills from temporary chemical toilets used by construction workers. 4. The generation of domestic waste by construction workers. 5. Spills from fuel storage tanks during construction. 6. Pollution from concrete mixing. 7. Any construction material remaining within the construction area once construction is completed.	DIRECT	STUDY AREA	SHORT TERM	MAY OCCUR	SLIGHTLY	LOW -	✦ Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills; ✦ Any waste generated during construction, must be stored in designated containers, and removed from the site by the construction teams; and ✦ Any left-over construction materials must be removed from site.	ACHIEVABLE	LOW-
SOIL POLLUTION	Increase in areas susceptible to soil pollution.	CUMULATIVE	REGIONAL	SHORT TERM	MAY OCCUR	SLIGHTLY	LOW -	✦ Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills; ✦ Any waste generated during construction, must be stored in	ACHIEVABLE	LOW -

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								<i>designated containers and removed from the site by the construction teams; and</i> <i>✦ Any left-over construction materials must be removed from site.</i>		
SOIL COMPACTION	The clearing and levelling of land for the wind turbines and supporting infrastructure as well as the access roads, will result in soil compaction. In the area where the access road will be constructed, topsoil will be removed and the remaining soil material will be deliberately compacted to ensure a stable road surface.	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE	MODERATE -	<i>✦ Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint;</i> <i>✦ Unnecessary land clearance must be avoided;</i> <i>✦ Where possible, conduct the construction activities outside of the rainy season; and</i> <i>✦ Vehicles and equipment must park in designated parking areas.</i>	ACHIEVABLE	LOW -
SOIL COMPACTION	Increase in areas with compacted soils.	CUMULATIVE	REGIONAL	MEDIUM TERM	PROBABLE	MODERATE	MODERATE -	<i>✦ Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint;</i> <i>✦ Unnecessary land clearance must be avoided;</i> <i>✦ Where possible, conduct the construction activities outside of the rainy season; and</i> <i>✦ Vehicles and equipment must park in designated parking areas.</i>	ACHIEVABLE	LOW -
AQUATIC IMPACT ASSESSMENT										
DIRECT ECOSYSTEM MODIFICATION OR DESTRUCTION / LOSS IMPACTS	Direct, permanent modification and/or loss of up to 0.04 ha of a moderately-high EIS watercourse (A06) for the construction of one satellite camp.	DIRECT	STUDY AREA	PERMANENT	DEFINITE	SLIGHT	LOW -	<u>Avoid/prevent:</u> <i>✦ The following buffers should be applied to all watercourses and wetlands (i.e. channelled drainage lines and longitudinal washes) based on their EIS rating:</i> ○High EIS – 50 m; ○Moderate to moderately-high EIS – 30 m; and ○Moderately-low EIS – 15 m. <i>✦ No turbines or pylons should be placed within these watercourses or their buffers.</i> <i>✦ In accordance with the best practice guidelines, unnecessary watercourse powerline and road crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided.</i> <i>✦ Construction materials must not be stored within the moderate to high EIS areas or their buffers.</i> <i>✦ Stockpiles must not be stored within the moderate to high sensitivity areas or their buffers.</i>	IRREVERSIBLE	VERY LOW -
	Direct, permanent modification and/or loss of up to 0.54 ha of moderately-low to high EIS watercourses for the construction of 12 m wide access roads through six watercourses (A02, A04, A06, F09, F15 and a dam).	DIRECT	STUDY AREA	PERMANENT	DEFINITE	SLIGHT	LOW -		ACHIEVABLE, PARTIALLY LOST	LOW -
ALTERATION OF HYDROLOGICAL AND GEOMORPHOLOGICAL PROCESSES	Localised, long-term alteration of hydrology and geomorphology of watercourses moderately-high EIS watercourse (A06) in the vicinity of the proposed satellite camp due to construction. This will include localised infilling, surface compaction and hardening, as well as changes to local run-off, erosion and sedimentation.	INDIRECT, CUMULATIVE	LOCALISED	LONG TERM	DEFINITE	SLIGHT	LOW -		ACHIEVABLE	VERY LOW -
	Localised, permanent alteration of hydrological and geomorphological processes within moderate to high EIS watercourses (A02, A04, A06, F09, F15 and a dam) at and downstream of the new and/or upgraded access road crossings during construction.	INDIRECT, CUMULATIVE	LOCALISED	LONG TERM	DEFINITE	SLIGHT	LOW -		ACHIEVABLE	LOW -
ECOLOGICAL CONNECTIVITY AND EDGE DISTURBANCE IMPACTS	Temporary reduction of ecological connectivity between up- and downstream sections of moderate to high EIS watercourses (A02, A04, A06, F09, F15 and a dam) during construction of access road crossings.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	LOW -		ACHIEVABLE	VERY LOW -

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								<p><u>Minimize/reduce:</u></p> <ul style="list-style-type: none">✦ Construction activities should be undertaken during the driest part of the year to minimize erosion and downstream sedimentation due to excavation, etc.✦ Appropriate stormwater structures must be implemented during construction to control run-off and minimize erosion.✦ Vegetation clearing must be kept a minimum and only to the site footprint.✦ Erosion controls and sediment trapping measures must be put in place.✦ Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses.✦ Stockpiles must not exceed 1.5m in height. Stockpiles must be covered during windy periods.✦ Best practice powerline and access road crossing alignment measures must be implemented (refer to Sections Error! Reference source not found. and Error! Reference source not found.). Where watercourse crossings are required, every effort should be made to minimize the impacts by considering the following:<ul style="list-style-type: none">○ Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing road crossings.○ The length of watercourse at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow. <p><u>Remediate/rehabilitate:</u></p> <ul style="list-style-type: none">✦ Disturbed areas must be monitored for erosion channels and these must be rehabilitated.✦ All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.✦ Road crossings should be used to assist in re-instating some of the lost base level as a result of historical		

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								<i>erosional incision. The proposed access roads should serve a dual function, namely as a crossing of the washes and a means of stabilising the longitudinal slope of the watercourses.</i> <ul style="list-style-type: none"> ✦ <i>Anchored brush packs should be used in Badlands to assist with their rehabilitation.</i> ✦ <i>Within Soyuz 5, targeted rehabilitation at road crossings should be concentrated within unit A04 in particular. Several other assessment units within the broader WEF cluster can also be targeted for rehabilitation.</i> 		
WATER POLLUTION IMPACTS	Pollution of watercourses due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.	DIRECT	LOCALISED	LONG TERM	POSSIBLE	SLIGHT	LOW -	Avoid/prevent: <ul style="list-style-type: none"> ✦ No concrete mixing must take place within 50 m of any watercourse. ✦ No machinery must be parked overnight within 50 m of the watercourses. ✦ All stationary machinery must be equipped with a drip tray to retain any oil leaks. ✦ Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp. ✦ No ablution facilities must be located within 50 m of any watercourse. ✦ Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution. ✦ Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it. ✦ All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site. Remediate/rehabilitate: <ul style="list-style-type: none"> ✦ Emergency plans must be in place in case of spillages onto bare soil or within watercourses. 	ACHIEVABLE	VERY LOW -
CUMULATIVE DIRECT IMPACTS	Cumulative direct modification and/or loss of up to 16.78 ha of watercourse units across the entire Soyuz WEF Cluster during the construction phase. This includes 0.31 ha to turbine foundations, 1.50 ha to hardstands, 14.46 ha to 12 m wide access roads and 0.51 ha to satellite camps.	DIRECT, CUMULATIVE	MUNICIPAL	PERMANENT	PROBABLE	MODERATE	MODERATELY HIGH -	✦ Application of all recommended mitigation measures to avoid, minimize and rehabilitate impacts across all WEF projects within the Soyuz Cluster.	ACHIEVABLE, PARTIALLY LOST	MODERATELY LOW -
CUMULATIVE INDIRECT IMPACTS	Cumulative widespread, permanent alteration of hydrological and geomorphological processes within watercourses across the entire	INDIRECT, CUMULATIVE	MUNICIPAL	PERMANENT	POSSIBLE	MODERATE	MODERATE -		ACHIEVABLE, PARTIALLY LOST	LOW -

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	Soyuz WEF Cluster at and downstream of the proposed infrastructure.									
NO-GO: ALTERATION OF HYDROLOGICAL GEOMORPHOLOGICAL PROCESSES	NO-GO IMPACT: Ongoing alteration and disturbance of the watercourses over the long-term, due to widespread overgrazing, cultivation and other land uses, as well as more localised disturbances such as the use of existing access roads, collectively leading to decreased vegetation cover and increased run-off, erosion and sedimentation, particularly during storm and flood events	NO-GO: INDIRECT, CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	MODERATE	LOW -	✚ Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	N/A	
NO-GO: ECOLOGICAL CONNECTIVITY AND EDGE DISTURBANCE IMPACTS	Reduction of ecological connectivity between sections of watercourse units at and downstream over the long-term due to existing land uses.	NO-GO: INDIRECT, CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	SLIGHT	LOW -	✚ Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	N/A	
NO-GO: WATER POLLUTION IMPACTS	Reduction of water quality over the long-term due to existing land uses (particularly livestock grazing and cultivation), as well as ongoing erosion and sedimentation of watercourses.	NO-GO: INDIRECT, CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	SLIGHT	LOW -	✚ Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	N/A	
AVIFAUNAL IMPACT ASSESSMENT										
DIRECT HABITAT DESTRUCTION	Direct habitat destruction associated with WEFs is generally low relative to the overall size of the project area. This impact is largely unavoidable, resulting in some birds being displaced from the project site.	DIRECT	STUDY AREA	LONG TERM	DEFINITE	SLIGHT	LOW -	✚ <i>The footprint within Medium and High Sensitivity areas must be minimized and avoided wherever possible;</i> ✚ <i>Laydown and other temporary infrastructure to be placed outside of Medium and High sensitivity areas, preferably within previously transformed areas, wherever possible;</i> ✚ <i>Appropriate run-off and erosion control measures must be implemented where required;</i> ✚ <i>A site-specific Environmental Management Programme (EMPr) must be developed and implemented. The EMPr must give appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat (e.g. no open fires outside of designated areas);</i> ✚ <i>All contractors are to adhere to the</i>	ACHIEVABLE	LOW -

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								<p><i>EMPr and must apply good environmental practice during construction;</i></p> <p>✦ <i>All hazardous materials must be stored in the appropriate manner to prevent contamination of the site and downstream environments. Any accidental chemical, fuel and oil spills that occur at the site must be cleared as appropriate for the nature of the spill;</i></p> <p>✦ <i>Existing roads and farm tracks must be used where possible;</i></p> <p>✦ <i>The minimum footprint areas of infrastructure must be used wherever possible, including road widths and lengths;</i></p> <p>✦ <i>No off-road driving must be permitted in areas not identified for clearing;</i></p> <p>✦ <i>An Environmental Officer (EO) must form part of the on-site team to ensure that the EMPr is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to oversee the implementation activities and monitor compliance for the duration of the construction phase; and</i></p> <p>✦ <i>Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken.</i></p>		
DISTURBANCE AND DISPLACEMENT	Indirect loss of habitat from disturbance during the construction phase is temporary in nature and is expected to result largely from the presence of heavy machinery and increased activity of construction personnel.	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	SLIGHT	LOW -	<p>✦ <i>A site specific EMPr must be developed and implemented. The EMPr must give appropriate and detailed description of how construction activities must be conducted;</i></p> <p>✦ <i>All contractors are to adhere to the EMPr and must apply good environmental practice during construction;</i></p> <p>✦ <i>The ECO must oversee activities and ensure that the site specific EMPr is implemented and enforced;</i></p> <p>✦ <i>Maximum use of existing access road and servitudes;</i></p>	ACHIEVABLE	LOW -

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								<ul style="list-style-type: none">✦ Existing and novel access roads are to be suitably upgraded or constructed to prevent damage and erosion resulting from increased vehicular traffic and construction vehicles;✦ No off-road driving in undesignated areas;✦ Speed limits (50 km/h) must be strictly enforced on site to reduce unnecessary noise;✦ COnstruction camps must be lit with as little light as practically possible, with the lights directed downwards where appropriate;✦ The movement of construction personnel must be restricted to the construction areas on the project site;✦ No dogs or cats other than those of the landowners must be allowed on site;✦ The appointed ECO must be trained to identify the potential Red Data species, as well as the signs that indicate possible breeding by these species;✦ The ECO must during audits/site visits make a concerted effort to look out for such breeding activities of SCCs (e.g. cranes, Secretarybird). Additional efforts must include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species; and✦ If any avifaunal SCCs are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.		
DIRECT MORTALITY	Fatalities of avifaunal species can occur through collision with vehicles as traffic in the area increases due to construction activity.	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	LOW -	<ul style="list-style-type: none">✦ Maximum use of existing access road and servitudes;	IRREVERSIBLE	LOW -

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	<p>Large-bodied and ground dwelling species (e.g. korhaans, cranes and bustards) are at increased risk, but this impact can be effectively mitigated against.</p> <p>Temporary fencing can result in collisions, entrapment or entanglement if not suitably installed. Similarly ground dwelling avifauna (particularly chicks) can fall into uncovered excavations and become entrapped.</p>							<p>✧ No off-road driving in undesignated areas;</p> <p>✧ Speed limits (50 km/h) must be strictly enforced on site to reduce probability of vehicle collisions;</p> <p>✧ The movement of construction personnel must be restricted to the construction areas on the project site;</p> <p>✧ NO dogs or cats other than those of the landowners must be allowed on site;</p> <p>✧ Any holes dug e.g. for foundations of pylons must not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter;</p> <p>✧ Temporary fencing must be suitably constructed, e.g. if double layers of fencing are required for security purposes, they must be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences; and</p> <p>✧ Roadkill must be reported to the ECO and removed as soon as possible to reduce attracting crows to the area.</p>		
CUMULATIVE IMPACT ON AVIFAUNAL HABITAT, DISPLACEMENT AND DIRECT MORTALITY	<p>At least 6 onshore wind facilities and onshore wind/solar PV combined facilities are being considered according to the DFFE Renewable Energy database (Q3 2022) within 50 km of the proposed development site, mostly towards the town of De Aar the north-east.</p> <p>In addition to these, the Britstown WEF Complex comprises 5 WEFs on the neighbouring properties.</p>	INDIRECT, CUMUALTIVE	NATIONAL	LONG TERM	PROBABLE	SEVERE	HIGH -	<p>✧ All appropriate mitigation measures listed above should be implemented;</p> <p>✧ Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</p>	ACHIEVABLE, PARTLY LOST	MODERATE -
BAT IMPACT ASSESSMENT										
HABITAT MODIFICATION	Bats can be impacted indirectly through the modification or removal of habitats, and can also be displaced from foraging habitat by the construction of wind turbines and associated infrastructures. The removal of vegetation during the construction phase can impact bats by removing vegetation cover and linear features that some bats use for foraging and commuting. This modification could subsequently also create favourable conditions for insects upon which bats feed which would in turn attract bats to the proposed WEF area.	INDIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	MODERATE -	<p>✧ The removal of vegetation and man-made buildings should be avoided in all high sensitive areas, as far as possible, and reduced across the project site in all other areas.</p>	ACHIEVABLE	LOW -
		NO-GO	NO IMPACT							N/A
DISTURBANCE /	WEF’s have the potential to impact bats indirectly during the	INDIRECT	STUDY	SHORT	PROBABLE	MODERATE	MODERATE -	<p>✧ Limit construction activities to</p>	ACHIEVABLE	LOW -

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DISPLACEMENT	construction phase through the disturbance of roosts or when conducting activities during hours of important bat foraging activities. Relevant activities include the construction of roads, O&M buildings, sub-station(s), internal transmission lines and the installation of wind turbines. Excessive noise and dust during the construction phase could result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.		AREA	TERM				daylight hours where possible.		
		NO-GO	NO IMPACT					✦ Avoid all construction activities within potential roosting habitats, if identified at the time when construction activities (for wind turbines and associated infrastructures) take place. No confirmed roosts have been identified on site to date, although it is recommended for a final specialist site walk-through to take place prior to construction to confirm this.	N/A	
ECOLOGICAL IMPACT ASSESSMENT										
LOSS OF FAUNAL HABITAT	The clearing of habitat for the project infrastructure will result in the loss of faunal habitat. Vegetation such as trees and shrubs will be removed and earthworks and heavy machinery will impact microhabitats such as burrows, fallen trees and rocks that will be removed or relocated. The faunal species that may utilise the habitat within the project footprint will no longer have access to these habitats for the life of the project and are considered negatively impacted by the project. However, ample suitable faunal habitat is present within the project area for these species.	DIRECT	STUDY AREA	PERMANENT	DEFINITE	MODERATE	MODERATE -	<ul style="list-style-type: none">The development must consolidate road networks to minimise the loss of faunal habitat.All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint.Microhabitats (e.g. rock stacks and logs) in the clearing footprint must be relocated to the same habitat immediately adjacent to the removal site. E.g. Rock stacks should be restacked.	DIFFICULT	MODERATE -
	NO IMPACT	NO-GO	NO IMPACT					<ul style="list-style-type: none">✦ Temporary infrastructure (laydown areas, widened roads, etc.) must be rehabilitated and efforts must provide habitat for faunal species by placing logs and rocks at strategic sites to provide shelter for small mammals and reptiles.	NO IMPACT	
LOSS OF FAUNAL SPECIES OF CONSERVATION CONCERN	The grassland associated with the Black-footed Cat (VU) habitat was found to be of medium sensitivity but the shrubland (rocky outcrops and slopes) associated with the Southern Mountain Reedbuck and Dwarf Karoo Tortoise (EN) was determined to have a High SEI.	DIRECT	NATIONAL	PERMANENT	MAY OCCUR	SEVERE	HIGH -	<ul style="list-style-type: none">A clause must be included in contracts for ALL personnel (i.e. including contractors) working on site stating that: “no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass.”	DIFFICULT	MODERATE -
	The Riverine Rabbit is unlikely to occur due to lack of habitat availability.							<ul style="list-style-type: none">In addition, a clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.		
	NO IMPACT	NO-GO	NO IMPACT						NO IMPACT	

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ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (PROBABILITY/ LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	REVERSABILITY/ MITIGATION	SIGNIFICANCE POST-MITIGATION
								⚠️ A search and rescue should be conducted for the Dwarf Karoo Tortoise and if found must be relocated to suitable habitat immediately adjected to where it was found.		
DISTURBANCE TO FAUNAL SPECIES AND THEIR LIVELIHOOD DUE TO CONSTRUCTION RELATED ACTIVITIES	Construction activities (earthworks, blasting, night lighting) create noise, dust and vibrations that fauna experience for the duration of the construction phase. It is unlikely that animals in the area are habituated to these activities and their livelihood activities are likely to be disturbed to some extent. The construction activities may cause individuals to move away from the immediate area into surrounding areas, increasing competition for food and shelter in those areas, and may even disrupt their current breeding cycle causing them to skip a season.	DIRECT	MUNICIPAL	SHORT TERM	PROBABLE	MODERATE	MODERATE -	<ul style="list-style-type: none">Dust suppression measures must be implemented in the dry and/or windy months.All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.	ACHIEVABLE	LOW -
	NO IMPACT	NO-GO	NO IMPACT					<ul style="list-style-type: none">A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided.No construction night lighting must be allowed. If required, Minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.Steep sided drains, gutters, canals and open pits/trenches must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck. No unnecessary structures that would act as pitfall traps for animals must be constructed.	NO IMPACT	
MORTALITY OF FAUNAL SPECIES DUE TO EARTHWORKS, ROADKILL AND PERSECUTION	Removal of faunal habitat and land levelling machinery may cause mortalities of faunal species sheltering or taking refuge within the habitat, such as reptiles, amphibians and small rodents that shelter in rocky crevices. Contractor vehicles may cause faunal mortalities due to collision. In addition, species perceived as a threat are known to be persecuted e.g. snakes.	DIRECT	REGIONAL	LONG TERM	PROBABLE	MODERATE	MODERATE-	<ul style="list-style-type: none">Speed restrictions within the residential development for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.	ACHIEVABLE	MODERATE -
	NO IMPACT	NO-GO	NO IMPACT					<ul style="list-style-type: none">Any faunal species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and if somewhat intact preserved and donated to the nearest university, museum or SANBI.A trained snake handler must be on call during construction to remove any snakes within construction areas.A clause relating to fines, possible dismissal and legal	NO IMPACT	

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								<i>prosecution must be included in all contracts for ALL personnel (i.e. including contractors) working on site should any speeding or persecution of animals occur.</i>		
INCREASED REDUCTION IN FAUNAL HABITAT AND INCREASE DISTURBANCE OF FAUNAL SPECIES	The cumulative impact associated with all six WEF will result in the combined loss of faunal habitat across all six sites and faunal species that will move due to the disturbance may have to move further as adjacent habitat will be impacted on as well.	CUMULATIVE	MUNICIPAL	PERMANENT	DEFINITE	SEVERE	HIGH -	Refer to mitigation measures above.	<i>IRREVERSIBLE</i>	MODERATE -
INCREASED FAUNAL MORTALITY	Removal of faunal habitat and land levelling machinery may cause mortalities of faunal species sheltering or taking refuge within the habitat, such as reptiles, amphibians and small rodents that shelter in rocky crevices. Contractor vehicles may cause faunal mortalities due to collision. In addition, species perceived as a threat are known to be persecuted e.g. snakes.	CUMULATIVE	MUNICIPAL	PERMANENT	PROBABLE	SEVERE	HIGH -		<i>IRREVERSIBLE</i>	MODERATE-
LOSS OF EASTERN UPPER KAROO	The clearing of vegetation for the construction of the WEF and associated infrastructure will result in the permanent loss of approximately 179ha of Eastern Upper Karoo. The extent of vegetation that will be impacted equates to 0.004% of the remaining extent of this vegetation unit. The loss of this vegetation type, which is listed as Least Concern, will have an overall impact of moderate significance. This impact is difficult to mitigate as the loss of vegetation is definite and permanent and as such the impact will remain of moderate significance even after mitigation measures have been implemented.	DIRECT	STUDY AREA	PERMANENT	DEFINITE	MODERATE	MODERATE -	<ul style="list-style-type: none"> Construction vehicles and machinery must not encroach into identified ‘no-go’ areas or areas outside the project footprint. Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas). 	<i>DIFFICULT</i>	MODERATE -
	The cumulative impact associated with all 6 WEFs will result in the combined loss of 1002 ha of Eastern Upper Karoo which is 0.2% of the remaining extent of this vegetation type. This is compounded by an additional 15 known WEFs in the 100 km radius of the proposed project. It has been assumed that these 15 known WEF will each result in an estimated loss of 0.1% of this vegetation type per WEF. Combined with the 6 Soyuz WEF this equates to approximately 1.7%. Given how widespread this vegetation type is, and that a large portion still remains intact, the loss of 2% (rounded up from 1.7%) of this vegetation type is still within the limit of acceptable change.	CUMULATIVE, DIRECT	NATIONAL	PERMANENT	DEFINITE	MODERATE	MODERATE -	<ul style="list-style-type: none"> Only indigenous species must be used for rehabilitation. Where possible, lay down areas must be located within previously disturbed sites. Employees must be prohibited from making open fires during the construction phase. Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring. 	<i>DIFFICULT</i>	MODERATE -
	No-Go: If the project does not proceed, the property would continue to be grazed by small livestock resulting in the continued degradation of the site. The impact associated with the no-go alternative would be low.	NO-GO	LOCALISED	LONG TERM	PROBABLE	LOW	LOW -	<ul style="list-style-type: none"> An alien invasive management plan for the site must be created. An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site. Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant. In such cases that this is not feasible, any requirement for translocation 	N/A	

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								must be discussed with the relative authorities prior to translocation taking place.		
LOSS OF UPPER KAROO HARDEVELD	The clearing of vegetation for the construction of the WEF and associated infrastructure will result in the permanent loss of approximately 15 ha of Upper Karoo Hardeveld. The extent of vegetation that will be impacted equates to 0.0012% of the remaining extent of this vegetation unit. The loss of this vegetation type, which is listed as Least Concern, will have an overall impact of moderate significance. This impact is difficult to mitigate as the loss of vegetation is definite and permanent and as such the impact will remain of moderate significance even after mitigation measures have been implemented.	DIRECT	STUDY AREA	PERMANENT	DEFINITE	MODERATE	MODERATE -	⚡ All mitigation measures listed under LOSS OF EASTERN UPP KARROO above must be implemented.	DIFFICULT	MODERATE -
	The cumulative impact associated with all 6 WEFs will result in the combined loss of 4035 ha of Upper Karoo Hardeveld which is 0.34% of the remaining extent of this vegetation type. This is compounded by an additional 15 known WEFs in the 100 km radius of the proposed project site. It has been assumed that these 15 known WEF will each result in an estimated loss of 0.1% of this vegetation type per WEF. Combined with the 6 Soyuz WEF, this equates to approximately 1.84%. Given how widespread, this vegetation type is and that a large portion still remains intact, the loss of approximately 2% (rounded up from 1.84%) of this vegetation is still within the limit of acceptable change.	CUMULATIVE, DIRECT	STUDY AREA	PERMANENT	DEFINITE	MODERATE	MODERATE -		IRREVERSIBLE	MODERATE -
	No-Go: If the project does not proceed, the property would continue to be grazed by small livestock, such as sheep, resulting in the continued degradation of the site. The no-go alternative would be low.	NO-GO	LOCALISED	LONG TERM	PROBABLE	LOW	LOW -		N/A	
LOSS OF PLANT SPECIES OF CONSERVATION CONCERN	No restricted range species or CR, EN or VU species were recorded within the site during the field survey. However, two SCC were identified during the desktop assessment. One species, <i>Tridentia virescens</i> , has a high likelihood of occurrence within the washes and the second species, <i>Hereroa concava</i> , has a moderate likelihood of occurrence. If the species are present within the infrastructure footprint, the impact will be of high significance. However, if the recommended mitigation measures are implemented, the impact can be reduced to moderate significance.	DIRECT	LOCALISED	LONG TERM	MAY OCCUR	SEVERE	HIGH -	All mitigation measures listed under LOSS OF EASTERN UPPER KARROO above must be implemented in addition to the following: ⚡ An ecological walk-through must be undertaken prior to construction and where Threatened (i.e. Critically Endangered, Endangered and Vulnerable) species are recorded, project infrastructure must be moved to avoid these populations. If this is not feasible, then a translocation plan for the population must be designed and implemented with input from an experienced horticulturalist with knowledge on how to move these species to ensure the best chance of survival.	ACHIEVABLE	MODERATE -
	The cumulative impact associated with all 6 WEFs as well as the additional additional 15 known WEFs in the 100 km radius of the proposed project will have an impact on this vegetation type. This vegetation type is a plant community that falls under the Eastern Upper Karoo Vegetation type and is difficult to assess as its extent within South Africa is not known. However, given its high sensitivity, it is assumed that all WEF within the area have minimised placing infrastructure within this vegetation type.	CUMULATIVE, DIRECT	NATIONAL	LONG TERM	PROBABLE	LOW	MODERATE -		DIFFICULT	MODERATE -
	No-Go: If the project does not proceed, the property would continue to be grazed by small livestock. Impacts on SCC are likely to be negligible	NO-GO	NEGLEGIBLE							
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS	Fragmentation is one of the most important impacts on vegetation as it creates breaks in previously continuous vegetation, causing a reduction in the gene pool and a decrease in species richness and diversity. This impact occurs when more and more areas are cleared, resulting in the isolation of functional ecosystems, which results in reduced biodiversity and reduced movement due to the absence of ecological corridors.	DIRECT	STUDY AREA	PERMANENT	PROBABLE	MODERATE	MODERATE -	All mitigation measures listed under LOSS OF EASTERN UPP KARROO above must be implemented in addition to the following: ⚡ Rehabilitate laydown areas ⚡ Use existing access roads and upgrade these where necessary.	ACHIEVABLE	LOW -

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	The infrastructure associated with the WEF, particularly the roads, will increase habitat fragmentation by creating breaks in the environment. However, the movement of species (fauna and seeds) will not be entirely prohibited due to the nature of the infrastructure and the ecological functioning of the site can still be maintained.									
	The cumulative impact associated with all known WEF in the area will increase the probability that SCC will be impacted. However, it is assumed that each WEF will implement sufficient mitigation measures to avoid impacting populations of SCC where feasible.The cumulative impact associated with all known WEF in the area will increase the probability that SCC will be impacted	CUMULATIVE, DORECT	NATIONAL	LONG TERM	MAY OCCUR	VERY SEVERE	HIGH -	it is assumed that the DFFE will not authorise any projects that severely impact SCC and that each WEF will implement measures to reduce these impacts. If this is implemented, the impact will be reduced to MODERTE -	ACHIEVABLE	MODERATE -
	No-Go: If the project does not go ahead, the vegetation would remain intact and there will be limited impacts to ecosystem function and process. The impact associated with this will be of low significance.	NO-GO	LOCAL	MAY OCCUR	DEFINITE	MODERATE	LOW -	N/A	N/A	
HERITAGE IMPACT ASSESSMENT										
LOSS OF HERITAGE RESOURCE FOR S5WEF01 - S5WEF34	Construction activities pose the greatest threat to tangible heritage resources within the cultural landscape and it is often during this Phase that heritage sites are lost. An array of archaeological areas occurs across the project landscape, many of which have been excluded from infrastructure development zones at Scoping Level. Still, Stone Age localities of low significance and not conservation-worthy occur in project footprints even though the resources may be destroyed during construction, the impact is inconsequential. Previously undetected cultural (archaeological) layers are usually superficial, subsoil layers and that makes them easily vulnerable to destruction and the likelihood for encountering additional cultural heritage sites as the land clearing process commences, or during construction of infrastructure should be considered. It should be noted that graves and cemeteries do not only occur around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements in the rural areas of the Northern Cape Province. The probability of informal human burials encountered during the construction phase should thus not be excluded. Monitoring activities will be required throughout the construction phase of the Project in order to avoid the destruction of previously undetected heritage sites and human burials.	DIRECT	SHORT TERM	STUDY AREA	UNLIKELY	SLIGHT / SLIGHTLY BENEFICIAL	LOW + /-	No further action / Monitoring Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO AND/OR ESCO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed. Site Monitoring: General Site Monitoring in order to detect the presence of and limit impact on previously undocumented heritage receptors during construction / site clearing / earth moving Avoidance This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.	IRREVERSIBLE	LOW +/ -
CUMULATIVE IMPACTS	It is the opinion of the Specialist that the proposed Soyuz 5 Wind Energy Facility and its associated power line connection will have a low negative cumulative impact on the heritage value of the area for the following reasons:	CUMULATIVE	LOCALISED	LONG TERM	UNLIKELY	LOW	LOW -	high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. Mitigation This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of	REVERSIBLE	LOW -

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	<ul style="list-style-type: none">- The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads.- The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.- The proposed Soyuz 5 WEF is situated in region which has seen the rapid development of vast and large-scale renewable energy facilities such as the Maanhaarberg WEF, the Great Karoo Renewable Energy Facility, the Modderfontein WEF and many Solar PV Developments around the town of De Aar. The developments cumulatively add to a transformed landscape and sense of place where the character of this portion of the Karoo is evolving into a centre for renewable power generation.- It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.							<i>medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.</i> <i>Compensation</i> <i>Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.</i> <i>Rehabilitation</i> <i>Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:</i> <ul style="list-style-type: none">- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.		
NOISE IMPACT ASSESSMENT										
CONSTRUCTION OF ACCESS ROADS	Daytime ambient sound levels could range from less than 20 dBA to more than 89 dBA, averaging at 33.9 dBA. Daytime ambient sound levels are thus low and typical of a rural noise district. It is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions). Road construction activities will increase ambient sound levels due to air-borne noise. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 2(pre-mitigation) of the Specialist Noise Report.	DIRECT	LOCALISED	TEMPORARY	POSSIBLE	VERY HIGH	LOW -	⚡ While projected noise levels may be very high, it relates to the low ambient sound levels measured during the day as well as strict assessment criteria. The significance of the noise impact remains low for access road construction activities and no additional mitigation is required or recommended. ⚡ There is no risk of any residual noise.	HIGHLY REVERSIBLE	LOW -
		CUMULATIVE	LOCALISED	TEMPORARY	POSSIBLE	VERY HIGH	LOW -		HIGHLY REVERSIBLE	LOW -
		NO-GO	NO IMPACT						NO IMPACT	
DAYTIME WTG CONSTRUCTION ACTIVITIES	Daytime ambient sound levels could range from less than 20 dBA to more than 89 dBA, averaging at 33.9 dBA. Daytime ambient sound levels are thus low and typical of a rural noise district. It is	DIRECT	LOCALISED	SHORT TERM	POSSIBLE	VERY HIGH	LOW -	While projected noise levels may be very high, it relates to the low ambient sound levels measured during the day as well as	HIGHLY REVERSIBLE	LOW -
		CUMULATIVE	LOCALISED	SHORT	POSSIBLE	VERY HIGH	LOW -		HIGHLY	LOW -

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	<p>expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions).</p> <p>Various construction activities (development of laydown areas and the hard standing areas, excavation of foundations, concreting of foundations and the assembly of the wind turbines tower and components, as well as construction of other infrastructure) taking place simultaneously during the day will increase ambient sound levels due to air-borne noise.</p> <p>The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 4 (pre-mitigation) of the Specialist Noise Report.</p>			TERM				<p>strict assessment criteria. The significance of the noise impact is low for daytime construction activities and no additional mitigation is required or recommended.</p> <p>There is no risk of any residual noises.</p>	REVERSIBLE	
		NO-GO	NO IMPACT						NO IMPACT	
NIGHT-TIME WTG CONSTRUCTION ACTIVITIES	<p>Night-time ambient sound levels could range from less than 20 dBA to more than 51 dBA, averaging at 23 dBA. Night-time ambient sound levels are very low during period of low winds and it is expected that introduced noises will be audible over significant distances during quiet periods (during low and no wind conditions).</p> <p>Various construction activities (likely limited to the pouring of concrete as well as erection of WTG components) taking place simultaneously at night will increase ambient sound levels due to air-borne noise, using the criteria of the author. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 5 (pre-mitigation) of the Specialist Noise Report.</p>	DIRECT	REGIONAL	SHORT TERM	HIGHLY LIKELY	VERY HIGH	HIGH -	<p>The significance of the noise impact is High and additional mitigation is required and recommended. Potential mitigation measures should include the following:</p> <ul style="list-style-type: none">Minimize night-time activities when working within 2,000m from any NSR. Work should only take place at one WTG location to minimize potential night-time cumulative noises (when working at night within 2,000m from NSR);An agreement should be signed between the applicant and the land owner that the structures near NSR19 will not be used for residential purposes once the project proceeds;The applicant must notify the NSR when night-time activities will be taking place within 1,000m from the NSR;The applicant must plan the completion of noisiest activities (such a pile driving, rock breaking and excavation) during the daytime period (even though it is expected that it is highly unlikely that this may take place at night);Construction of the B3-10 and B3-09 WTG should only take place during the daytime due to their close proximity to NSR19 (630 and 510m away from NSR19 respectively). This is only applicable should the location be used for residential purposes during the construction phase. <p>There is no risk of residual noise.</p>	HIGHLY REVERSIBLE	LOW -
		CUMULATIVE	REGIONAL	SHORT TERM	HIGHLY LIKELY	VERY HIGH	HIGH -		HIGHLY REVERSIBLE	LOW -
		NO-GO	NO IMPACT						NO IMPACT	
CONSTRUCTION TRAFFIC NOISES	<p>Daytime ambient sound levels could range from less than 20 dBA to more than 89 dBA, averaging at 33.9 dBA. Daytime ambient sound levels are thus low and typical of a rural noise district. It is expected that introduced noises will be audible over large distances during quiet periods (during low wind conditions).</p>	DIRECT	LOCALISED	SHORT TERM	POSSIBLE	VERY HIGH	LOW -	<p>The significance of noises due to construction traffic is low no additional mitigation is required or recommended.</p> <p>There is no risk of any residual noise.</p>	HIGHLY REVERSIBLE	LOW -
		CUMULATIVE	LOCALISED	SHORT TERM	POSSIBLE	VERY HIGH	LOW -		HIGHLY REVERSIBLE	LOW -
		NO-GO	NO IMPACT						NO IMPACT	

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	Construction traffic will increase ambient sound levels due to air-borne noise. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 3 (pre-mitigation) of the Specialist Noise Report.									
PALAENTOLOGICAL IMPACT ASSESSMENT										
LOSS OF FOSSIL HERITAGE	<p>The Soyuz 5 WEF is underlain by Late Caenozoic alluvium, Jurassic Karoo dolerite, and the Middle Permian Abrahamskraal Formation of the Beaufort Group (Karoo Supergroup). This part of the basin is extensively intruded by dolerite dykes and sills and the surrounding Beaufort sediments have been baked, thus compromising the fossil heritage of the area through thermal metamorphism. According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the alluvium is Moderate, while that of the Abrahamskraal Formation (Beaufort Group) is Very High. The Palaeontological Sensitivity of the Jurassic dolerite is Zero as it is igneous in origin (Almond and Pether, 2009; Almond et al., 2013). The Very High Palaeontological Sensitivity of the Abrahamskraal Formation triggers a site investigation.</p> <p>Although extensive research and fossil collecting have been conducted by palaeontologists in the last few decades, the Britstown area have been largely neglected. A 6-day overall comprehensive site-specific field survey of the Soyuz WEF Cluster was conducted on foot and by motor vehicle in October 2022. Weathered to fairly- well preserved in situ and loose vertebrate bone fragments, plant impressions and trace fossils were observed in the proposed development SOYUS 5 WEF development.</p> <p>The Cumulative impacts of the Soyuz 5 WEF development near Britstown is considered to be high pre- mitigation and Low post mitigation and falls within the acceptable limits for the project.</p>	DIRECT	STUDY SITE	LONG TERM/ PERMANENT	HIGHLY PROBABLE	HIGH	HIGH -	<p>✧ It is therefore considered that the proposed development will not lead to damaging impacts on the palaeontology of the area. The construction of the development may thus be authorized in its whole extent, as the development footprint is not considered sensitive from a palaeontological point of view. It is thus recommended that no further palaeontological heritage studies, ground truthing or specialist mitigation are required pending the discovery of new fossil assemblages.</p> <p>✧ The ECO AND/OR ESCO for this project must be informed that the Abrahamskraal Formation, Adelaide Subgroup, Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity.</p> <p>✧ Basic training in identifying fossil heritage is recommended for the ECO AND/OR ESCO and relevant staff. If any fossil remains or trace fossils are discovered during any phase of construction or operation, either on the surface or exposed by excavations, the ECO and/or ESCO in charge of this development should implement the Chance find Protocol immediately. These discoveries should be protected (if possible, in situ) and the ECO and/or ESCO must report such discoveries to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). Suitable mitigation (e.g. recording and collection) will consequently be undertaken by a palaeontologist.</p> <p>✧ Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet</p>	IRREVERSIBLE, ACHIEVABLE	LOW
		CUMULATIVE	STUDY SITE	LONG TERM/ PERMANENT	HIGHLY PROBABLE	HIGH	HIGH -		IRREVERSIBLE, ACHIEVABLE	LOW -

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								<i>the minimum standards for palaeontological impact studies proposed by SAHRA (2012).</i>		
SOCIAL IMPACT ASSESSMENT										
POSITIVE ATTITUDE TOWARDS THE DEVELOPMENT	Overall feelings in the town were overwhelmingly positive, and in the surrounding farms feelings were generally positive towards the WEF.	DIRECT	MUNICIPAL	SHORT TO MID TERM	DEFINITE	MODERATE	MODERATE +	<ul style="list-style-type: none"> ✦ <i>Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.</i> ✦ <i>Ensure that notice is given and landowners and locals are properly informed throughout the project.</i> 	ACHIEVABLE	MODERATE +
HIGH COMMUNITY EXPECTATIONS FOR BENEFITS RESULTING FROM THE PROJECT	Expectations are high among members of the local community in terms of what the development will offer and contribute, especially where it may improve their livelihoods.	DIRECT	MUNICIPAL	LONG TERM	DEFINITE	MODERATE	MODERATE +	<ul style="list-style-type: none"> ✦ <i>Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.</i> ✦ <i>Ensure that notice is given and landowners and locals are properly informed throughout the project.</i> ✦ <i>A positive relationship must be established and maintained with affected landowners. There should always be an open line of communication and grievances must be addressed satisfactorily and promptly.</i> ✦ <i>Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners. Disruptions to directly affected and adjacent landowners must be kept to a minimum.</i> ✦ <i>Complaints and concerns must be addressed promptly, and feedback must be given to complainants.</i> 	ACHIEVABLE	MODERATE +
JOB CREATION: CONSTRUCTION	A number of employment opportunities will be created during the construction phase.	DIRECT, INDIRECT AND CUMULATIVE	REGIONAL	SHORT TERM	DEFINITE	SEVERE (BENEFICIAL)	HIGH +	<ul style="list-style-type: none"> ✦ <i>Employment opportunities and criteria should be communicated to the community before being advertised outside the municipal area.</i> ✦ <i>Hiring should focus on the nearest and surrounding community. If not, jealousy and disdain or resentment for the project may develop.</i> ✦ <i>Unreasonable expectations with regards to employment opportunities should not be created, and the developers should be transparent about the limited number of employment opportunities that will be created.</i> 	ACHIEVABLE	HIGH +
SMME DEVELOPMENT	As part of the WEF's LED programme, development of SMMEs may	DIRECT,	MUNCIPAL	LONG TERM	POSSIBLE	SEVERE	HIGH +	<ul style="list-style-type: none"> ✦ <i>Ensure local SMME's are utilised</i> 	ACHIEVABLE	HIGH +

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	be supported.	INDIRECT AND CUMULATIVE				(BENEFICIAL)		<i>throughout the project, as far as possible.</i> ✦ <i>The creation of secondary opportunities for income generation, such as supplying meals to employees, should be investigated and implemented if possible.</i> ✦ <i>External contractors and suppliers from within the local municipality must be given preference.</i> ✦ <i>Source materials and products locally, as far as possible.</i>		
SUPPORT OF LOCAL/REGIONAL BUSINESSES: CONSTRUCTION	Personnel that come to the area during the construction phase will likely support local businesses, such as hospitality facilities, food outlets, etc. Local or regional businesses may also be able to supply some of the construction materials.	DIRECT, INDIRECT AND CUMULATIVE	REGIONAL	SHORT TERM	PROBABLE	MODERATE	MODERATE +	✦	ACHIEVABLE	MODERATE +
POSSIBILITY FOR TRAINING AND UPSKILLING OF LOCAL COMMUNITY DURING CONSTRUCTION, OPERATION AND THROUGH LED PROJECTS	There may be an opportunity to provide training and develop skills during both construction and operation phases. It is anticipated that there may also be such opportunities arising from the WEF’s LED programme subsequent to commencement of operation.	DIRECT	MUNICIPAL	LONG TERM	POSSIBLE	MODERATE	MODERATE +	✦ <i>It is recommended that these be maximised whenever possible, and that the local community, especially, be the beneficiaries of this.</i>	ACHIEVABLE	MODERATE +
IN-MIGRATION OF JOB SEEKERS	A large-scale in-migration of people in search of work is often a concern associated with new developments. However, this usually applies to larger developments, and is not expected to happen in a large scale in the instance of the WEF.	DIRECT	MUNICIPAL	LONG TERM	UNSURE	SLIGHT	LOW -	✦ <i>No mitigation possible.</i>	N/A	LOW -
INCREASE IN TRAFFIC DURING CONSTRUCTION	There will likely be an increase in traffic, especially construction vehicles, during the construction phase. However, this will be temporarily, and the Traffic Department did not express a concern in that regard, as the N12 is already used, and therefore able to accommodate, heavy duty traffic including trucks.	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	MODERATE -	✦ <i>Steps must be taken to minimise road accidents, including the use of clear signage, reducing speed limits and visible policing.</i>	ACHIEVABLE	LOW -
NOISE FROM CONSTRUCTION ACTIVITIES	Construction activities will create some noise disturbance, but since the development will be located outside town boundaries, it will likely not have much impact on residents of Britstown.	DIRECT	LOCAL	SHORT TERM	POSSIBLE	SLIGHT	LOW -	✦ <i>Measures should be taken to reduce noise. Noise generating activities should be limited to regular business hours.</i>	ACHIEVABLE	LOW -
THERE MAY BE SENSITIVE HERITAGE FEATURES ON THE SITE THAT MAY BE IMPACTED	There may be sensitive heritage features on the site that may be impacted.	DIRECT	LOCAL	PERMANENT	POSSIBLE	MODERATE	MODERATE -	✦ <i>Recommendations and mitigation measures contained in the Heritage Impact Assessment must be adhered to.</i>	EASILY ACHIEVABLE	MODERATE -
POSSIBLE REDUCTION IN CRIME RATES	The presence of the project could possibly reduce the rate of petty theft and stock theft in the area. People may also resort less to crime if they obtain legitimate incomes through employment or business opportunities.	DIRECT, INDIRECT, CUMULATIVE	LOCAL	LONG TERM	POSSIBLE	SLIGHT	LOW +	✦ <i>Measures should be taken to ensure security around any construction site, including maintaining access control onto affected farms.</i> ✦ <i>Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners.</i>	ACHIEVABLE	LOW +
LOSS OF AGRICULTURAL LAND	A small amount of agricultural land (used for grazing currently) will be lost to the wind turbines and access roads, but this will not be significant.	DIRECT	SUTDY AREA	LONG TERM	POSSIBLE	SLIGHT	LOW -	✦ <i>N/A</i>	N/A	LOW -
NEGATIVE VISUAL IMPACT ANDLOSS OF SENSE OF PLACE	WEFs invariably have a visual impact on an area. Many people perceive this as negative, and as spoiling the sense of place.	DIRECT	SUTDY AREA	LONG TERM	POSSIBLE	MODERATE	MODERATE -	✦ <i>Mitigation measures suggested by the visual impact specialist must be adhered to.</i>	N/A	MODERATE -
LOSS OF INCOME DUE TO VISUAL IMPACTS	The presence of the WEF may negatively impact a hunting establishment in that international clientele seek the specific aesthetic of the desolate landscape, which will change as a result	DIRECT, INDIRECT AND CUMULATIVE	LOCAL	LONG TERM	POSSIBLE	SLIGHT	LOW -	✦ <i>N/A</i>	N/A	LOW -

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	of the WEF.									
TRAFFIC IMPACT ASSESSMENT										
NOISE AND POLLUTION	During the construction phase, some dust and noise pollution will be generated through heave vehicles travelling toward and from the site.	DIRECT	STUDY AREA	SHORT TERM	DEFINITE	MODERATE	MODERATE -	⚡ Stagger turbine component delivery to site ⚡ Reduce the construction period	REVERSIBLE, ACHIEVABLE	LOW -
TRAFFIC IMPACTS	Trips will increase during the construction period, which is of temporary nature (for the duration of the construction period).	DIRECT	REGIONAL	SHORT TERM	DEFINITE	MODERATE	MODERATE -	⚡ Stagger the construction of the turbines ⚡ The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network. ⚡ Maintenance of haulage routes. ⚡ Design and maintenance of internal roads. ⚡ Schedule abnormal loads to outside peak traffic periods.	REVERSIBLE, ACHIEVABLE	LOW -
CUMULATIVE IMPACT: TRAFFIC IMPACTS AND ASSOCIATED NOISE AND DUST POLLUTION	The cumulative impact assumes that all approved developments will be constructed at the same time, which would increase noise, pollution and traffic on surrounding roads for the construction period.	CUMULATIVE	REGIONAL	LONG TERM	POSSIBLE	MODERATE	HIGH -	⚡ Only some of these developments will be successful at the respective bidding round and then constructed in agreement with the road authorities. ⚡ Scheduling of heavy and abnormal vehicles for the developments need to be planned and agreed upon between developers of any projects located within a 50km radius. ⚡ Stagger turbine component delivery to site ⚡ Reduce the construction period ⚡ Stagger the construction of the turbines ⚡ The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network. ⚡ Maintenance of haulage routes. ⚡ Design and maintenance of internal roads. ⚡ Schedule abnormal loads to outside peak traffic periods.	IRREVERSIBLE	MODERATE -
VISUAL IMPACT ASSESSMENT										
POTENTIAL VISUAL IMPACT OF CONSTRUCTION ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE FACILITY	During the construction period, there will be an increase in heavy vehicles utilising the roads to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity (within 5km). Within the region, dust as a result of construction activities may also be visible, as such it will result in a visual impact occurring during construction. Sensitive receptors in this zone consist of observers travelling along the N12, various secondary and internal farm roads, as well as residents of various homesteads (refer to Section 6.6 of the Specialist report for a full list).	DIRECT	NEIGHBOUR HOOD	SHORT TERM	DEFINITE	VERY HIGH	HIGH -	Mitigation / Management:	ACHIEVABLE	MODERATE -
		CUMULATIVE	No cumulative impacts as a result of the construction activities are expected.					⚡ Ensure that vegetation is not unnecessarily removed during the construction period.	N/A	
		NO-GO	NO IMPACT					⚡ Reduce the construction period through careful logistical planning and productive implementation of resources. ⚡ Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible. ⚡ Restrict the activities and movement	NO IMPACT	

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								<i>of construction workers and vehicles to the immediate construction site and existing access roads.</i> <i>✦ Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.</i> <i>✦ Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).</i> <i>✦ Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.</i> <i>✦ Rehabilitate all disturbed areas immediately after the completion of construction works.</i>		
OPERATIONAL PHASE										
AGRICULTURAL IMPACT ASSESSMENT										
SOIL EROISON	The areas where vegetation was cleared, will remain at risk of soil erosion, especially during a rainfall event when runoff from the cleared surfaces will increase the risk of soil erosion in the areas directly surrounding the wind turbines and buildings.	DIRECT	STUDY AREA	MEDIUM TERM	POSSIBLE	MODERATE	MODERATE -	<i>✦ The project site must regularly be monitored to detect early signs of soil erosion on-set.</i> <i>✦ If soil erosion is detected, the area must be stabilised by the use of geo-textiles and facilitated re-vegetation.</i>	ACHIEVABLE	LOW -
SOIL POLLUTION	During the operation phase of the project, the following activities can result in the chemical pollution of the soil: 1. Petroleum hydrocarbon (present in oil and diesel) spills by maintenance machinery and vehicles. 2. The generation of domestic waste by maintenance staff.	DURECT	STUDY AREA	SHORT TERM	MAY OCCUR	SLIGHTLY	LOW -	<i>✦ Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;</i> <i>✦ Any waste generated during construction, must be stored in designated containers and removed from the site by the construction teams; and</i> <i>✦ Any left-over construction materials must be removed from site.</i>	ACHIEVABLE	LOW -
AQUATIC IMPACT ASSESSMENT										
ALTERATION OF HYDROLOGICAL AND GEOMORPHOLOGICAL PROCESSES	Localised alteration of hydrological and geomorphological processes around the satellite camp within watercourse A06, resulting in increased localised run-off, erosion and sedimentation.	INDIRECT, CUMULATIVE	LOCALISED	PERMANENT	PROBABLE	SLIGHT	LOW -	<u>Minimize/reduce:</u> <i>✦ Stormwater infrastructure must be maintained and monitored for effectiveness with respect to controlling and minimising erosion and sedimentation of watercourses.</i>	ACHIEVABLE	VERY LOW -
	Alteration of hydrological and geomorphological processes within moderate to high EIS watercourses (A02, A04, A06, F09, F15 and a dam) at and downstream of the access road crossings during operational use of road for maintenance of infrastructure.	INDIRECT, CUMULATIVE	LOCALISED	PERMANENT	PROBABLE	SLIGHT	LOW -		ACHIEVABLE	LOW -

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								<p>✦ Given that water flows in the washes generally occur across a very wide front and are usually as very infrequent and very brief events, it is recommended that “drift-type” road crossings be used where appropriate and designed for flow over the road surface rather than directing it under the road with culverts. Where access road crossings of defined channels is required, box culverts must be established across the width of the watercourse.</p> <p><u>Remediate/rehabilitate:</u></p> <p>✦ The site must be monitored for erosion and should be rehabilitated where applicable.</p>		
	NO-GO IMPACT: Ongoing alteration and disturbance of the watercourses over the long-term, due to widespread overgrazing, cultivation and other land uses, as well as more localised disturbances such as the use of existing access roads, collectively leading to decreased vegetation cover and increased run-off, erosion and sedimentation, particularly during storm and flood events	NO-GO: INDIRECT, CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	MODERATE	LOW -	<p>✦ Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.</p>	N/A	
ECOLOGICAL CONNECTIVITY AND EDGE DISTURBANCE IMPACTS	Inadequate rehabilitation of disturbed areas may lead to the reduction of ecological connectivity and degradation of the surrounding environment.	DIRECT, INDIRECT	STUDY AREA	LONG TERM	POSSIBLE	SLIGHT	LOW -	<p><u>Remediate/rehabilitate:</u></p> <p>✦ Disturbed areas should be rehabilitated and re-vegetated.</p>	ACHIEVABLE	VERY LOW -
	Reduction of ecological connectivity between sections of watercourse units at and downstream over the long-term due to existing land uses.	NO-GO: INDIRECT, CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	SLIGHT	LOW -	<p>Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.</p>	N/A	
WATER POLLUTION IMPACTS	Routine maintenance may lead to the introduction of chemical / hazardous substances (e.g. oil spills from vehicles, etc.) into the watercourses, soil and/or groundwater, adversely affecting the watercourses in the broader area.	DIRECT	LOCALISED	LONG TERM	POSSIBLE	SLIGHT	LOW -	<p>✦ Avoid/prevent impact:</p> <p>✦ No machinery must be parked overnight within 50 m of the watercourses.</p> <p>✦ All stationary machinery must be equipped with a drip tray to retain any oil leaks.</p> <p>✦ Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.</p> <p>✦ All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site.</p>	ACHIEVABLE	VERY LOW -

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								<ul style="list-style-type: none"> ✦ Remediate/rehabilitate: ✦ Emergency plans must be in place in case of spillages onto bare soil or within water courses. 		
	Reduction of water quality over the long-term due to existing land uses (particularly livestock grazing and cultivation), as well as ongoing erosion and sedimentation of watercourses.	NO-GO: INDIRECT, CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	SLIGHT	LOW -	Mitigation measures are not prescribed for the no-go alternative, as the developer would not be involved in the implementation of these measures. Rather, the responsibility would fall to the landowner and/or managing authority to implement measures to address existing impacts.	N/A	
AVIFAUNAL IMPACT ASSESSMENT										
DISTURBANCE AND DISPLACEMENT	Disturbance and displacement by operational activities such as power line and turbine maintenance, fencing, and noise can lead to birds avoiding the area for feeding or breeding, and effectively leading to habitat loss and a potential reduction in breeding success.	DIRECT	STUDY AREA	LONG TERM	PROBABLE	MODERATE	MODERATE -	<ul style="list-style-type: none"> ✦ A site specific operational EMPr must be developed and implemented, which gives appropriate and detailed description of how operational and maintenance activities must be conducted to reduce unnecessary disturbance; ✦ All contractors are to adhere to the EMPr and must apply good environmental practice during all operations; ✦ The ECO and/or ESCO must be trained by an avifaunal specialist to identify the potential priority species and Red Data species as well as the signs that indicate possibly breeding by these species. If a priority species or Red Data species is found to be breeding (e.g. a nest site is located) on the operational WEF, the nest/breeding site must not be disturbed and an avifaunal specialist must be contacted for further instruction; and ✦ Operational phase bird monitoring, in line with the latest available guidelines, must be implemented. 	ACHIEVABLE	LOW -
DIRECT MORTALITY – COLLISION WITH INFRASTRUCTURE	WEFs can cause bird fatalities through the collision of birds with moving turbine blades.	DIRECT	REGIONAL	LONG TERM	PROBABLE	SEVERE	HIGH-	<ul style="list-style-type: none"> ✦ WTGs must not be constructed within (or encroach within) any High or Medium Sensitivity areas identified by the VERA model; ✦ WTGs are to be micro-sited to avoid blade tips from encroaching within these areas pending the specifics of final WTG dimensions; ✦ Additional mitigation (as detailed below) must be implemented for 	IRREVERSIBLE, DIFFICULT	MODERATE -

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								<p>WTGs placed within High and Medium sensitivity areas determined outside of VERA modelled areas;</p> <p>✦ Shut down-on-demand or Blade Painting (contingent on approval by the Civil Aviation Authority) or similar technology must be implemented for all WTGs that are positioned within or encroach on High and Medium Sensitivity areas;</p> <p>✦ Internal power lines must be buried wherever technically feasible;</p> <p>✦ Appropriate (approved) Bird Flight Diverters (BFDs) must be affixed to the entire length of novel overhead power lines (in all sensitivity categories);</p> <p>✦ If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility, the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action;</p> <p>✦ If double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences;</p> <p>✦ Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines;</p> <p>✦ Regular reviews of operational phase monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist;</p> <p>✦ The above reviews should strive to identify sensitive locations including WTGs and areas of increased collisions that may require additional mitigation;</p>		

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								<ul style="list-style-type: none">✦ An operational monitoring programme for any novel overhead power lines must be implemented to locate potential collision fatalities; and✦ Any fatalities located must be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT).		
DIRECT MORTALITY - ELECTROCUTION	<p>Electrocution refers to the scenario where a bird is perched or attempts to perch on energized structures and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.</p> <p>Overhead power line infrastructure with a capacity of 132 kV or more does not generally pose a risk of electrocution due to the large size of the clearances between the electrical infrastructure components. Electrocutions are therefore more likely for larger species whose wingspan is able to bridge the gap such as eagles or storks. A few large birds (such as Verreaux’s Eagle), susceptible to electrocution (particularly in the absence of safe and mitigated structures) occur in the area. Electrocution is also possible on electrical infrastructure within the substation particularly for species such as crows and owls.</p>	DIRECT	STUDY AREA	LONG TERM	PROBABLE	SLIGHT	LOW -	<ul style="list-style-type: none">✦ Internal power lines should be buried wherever possible;✦ All new overhead power line pylons must be of a design that minimizes electrocution risk. This can be achieved by using adequately insulated ‘bird friendly’ structures, with sufficient clearances between live components; and✦ An operational monitoring programme for the overhead power line route must be implemented to locate potential collision fatalities.	IRREVERSIBLE	LOW -
CUMULATIVE IMPACT ON AVIFAUNAL HABITAT, DISPLACEMENT AND DIRECT MORTALITY	<p>At least 6 onshore wind facilities and onshore wind/solar PV combined facilities are being considered according to the DFFE Renewable Energy database (Q3 2022) within 50 km of the proposed development site, mostly towards the town of De Aar the north-east.</p> <p>In addition to these, the Britstown WEF Complex comprises 5 WEFs on the neighbouring properties.</p>	INDIRECT, CUMUALTIVE	NATIONAL	LONG TERM	PROBABLE	SEVERE	HIGH -	<ul style="list-style-type: none">✦ All appropriate mitigation measures listed above should be implemented;✦ Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.	ACHIEVABLE, PARTLY LOST	MODERATE -
BAT IMPACT ASSESSMENT										
MORTALITY DUE TO WIND TURBINE COLLISION AND/OR BAROTRAUMA	<p>Bats can be impacted during the operational phase by means of collision with wind turbines and/or barotrauma. These impacts will be limited to species that make use of the airspace within the rotor swept zone of the wind turbines, during foraging, commuting and/or migration activities. Such impacts would also be further exacerbated with potential light pollution that would be present during operational activities. Certain bat species actively forage around artificial lights due to the higher numbers of insects which are attracted to these lights. This would bring these species into the vicinity of the operating turbines and increase the risk of collision/barotrauma for these species.</p>	DIRECT AND CUMULATIVE	REGIONAL	LONG TERM	PROBABLE	SEVERE	HIGH -	<ul style="list-style-type: none">✦ Implement an operational phase bat monitoring programme, in accordance with the most recent version of the operational phase bat monitoring guidelines.✦ Implement blade feathering (up to the manufacturers cut-in speed) as soon as operation begins, to prevent free-wheeling.✦ The placement of all turbines, as well as their full blade length, should avoid high sensitivity areas, to be considered from the outset of the design phase.✦ If residual impacts reach the threshold limit (at any wind turbine), then appropriate minimisation measures should be implemented (turbine curtailment and/or acoustic deterrence mechanisms).	ACHIEVABLE	MODERATE -

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								<i>Lighting at the project should be kept to a minimum at all associated infrastructures. Appropriate types of lighting are to be used to avoid attracting insects, and hence, bats. This includes downward facing low-pressure sodium and warm white LED lights. To be considered from the outset of the design phase.</i>		
DISTURBANCE/DISPLACEMENT	WEF's have the potential to impact bats indirectly during the operational phase through the disturbance of roosts or when conducting O&M activities during hours of important bat foraging activities. Excessive noise and dust during the operational phase could also result in bats abandoning their roosts, depending on the proximity of operational activities to roosts.	INDIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	MODERATE -	<ul style="list-style-type: none">✦ Limit O&M activities to daylight hours.✦ Avoid all O&M activities for wind turbines and associated infrastructures within potential bat roosting habitats. No confirmed bat roosts have been identified on site to date, although it is recommended that a suitably qualified bat specialist (appointed to conduct the operational phase bat monitoring programme) is to further advise on refining recommendations pertaining to O&M activities as new roosting information becomes available, during the project's operational phase (if relevant).	ACHIEVABLE	LOW -
		NO-GO	NO IMPACT						NO IMPACT	
BAT FATALITY IMPACTS ON A CUMULATIVE SCALE	Multiple WEF's impacting bats collectively, could have the potential to cause significant loss to affected species over a regional or national scale with an inability for the affected species to recover from such loss. This is likely to be most significant through bat mortality as a result of wind turbine collisions and/or barotrauma during the projects' operational phase, particularly during bat foraging/commuting activities. Presently, at least 4 onshore wind and solar PV facilities, as well as 3 wind energy facilities are being considered according to the DFFE Renewable Energy database (Q3 2022), within a 50 km region of the proposed Soyuz 5 WEF. Five additional wind energy facilities (Soyuz 2 WEF, Soyuz 3 WEF, Soyuz 4 WEF, Soyuz 1 WEF and Soyuz 6 WEF) are however known to be presently under assessment for EA application.	CUMULATIVE	NATIONAL	LONG TERM	PROBABLE	SEVERE	HIGH -	<ul style="list-style-type: none">✦ All mitigation measures, as listed in Table 7, are highly recommended for WEFs in the greater (50 km2) Project area, to reduce the probability of significant mortality impacts occurring at Soyuz 5 WEF, and subsequently on a cumulative scale as well.✦ Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive management processes across projects.	ACHIEVABLE	MODERATE -
ECOLOGICAL IMPACT ASSESSMENT										
DISTURBANCE TO FAUNAL SPECIES AND THEIR LIVELIHOOD DUE TO OPERATIONAL RELATED ACTIVITIES	Operational activities may create noise, dust and vibrations that fauna experience periodically for the duration of the operational phase. These activities could disturb animals and their livelihood activities to some extent. Infrastructure may create barriers that impact on faunal movements e.g. fences, walls	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE	MODERATE -	<ul style="list-style-type: none">✦ All vehicles must be maintained e.g. the sound generated by a vehicle must be below a certain decibel as prescribed in the relevant noise control regulations.	ACHIEVABLE	LOW -
	NO IMPACTS	NO-GO	NO IMPACTS					<ul style="list-style-type: none">✦ No night lighting must be allowed. If required, Minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.✦ Development must be designed to allow unencumbered movement, especially of small faunal species.	NO IMPACTS	

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS										
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								e.g. <ul style="list-style-type: none"> Permeable internal and external fences/walls (if any) must be implemented to allow for the movement of fauna through the development. These must have ground level gaps of 10cm x 10cm at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris. All guttering and kerbstones must to allow for easy movement of small fauna ⚡ Steep sided drains, gutters and canals must be covered with mesh (5mm x 5mm) or sloped to prevent fauna falling in and getting stuck.		
FAUNAL MORTALITY DUE TO ROADKILL AND PERSECUTION	Maintenance vehicles and project operation related monitoring may cause faunal mortalities due to collision.	DIRECT	REGIONAL	PERMANENT	PROBABLE	MODERATE	MODERATE -	⚡ Speed restrictions within the project area for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.	IRREVERSIBLE	LOW -
	NO IMPACTS	NO-GO	NO IMPACTS					⚡ No night driving should be permitted, if unavoidable, this must be restricted, and speed limits adhered to. ⚡ Any faunal species that may die as a result of collision must be recorded (i.e. be photographed, GPS co-ordinates taken) and placed on the EWT Roadkill App. ⚡ A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e. including contractors) working on site should any speeding or persecution of animals occur.	NO IMPACTS	
INCREASED REDUCTION IN FAUNAL HABITAT AND INCREASE DISTURBANCE OF FAUNAL SPECIES	The cumulative impact associated with all six WEF will result in the combined loss of faunal habitat across all six sites and faunal species that will move due to the disturbance may have to move further as adjacent habitat will be impacted on as well.	CUMULATIVE	MUNICIPAL	PERMANENT	DEFINITE	SEVERE	HIGH -	Refer to mitigation measures above.	IRREVERSIBLE	MODERATE -
INCREASED FAUNAL MORTALITY	Removal of faunal habitat and land levelling machinery may cause mortalities of faunal species sheltering or taking refuge within the habitat, such as reptiles, amphibians and small rodents that shelter in rocky crevices. Contractor vehicles may cause faunal mortalities due to collision. In addition, species perceived as a threat are known to be persecuted e.g. snakes.	CUMULATIVE	MUNICIPAL	PERMANENT	PROBABLE	SEVERE	HIGH -		IRREVERSIBLE	MODERATE-
INFESTATION OF ALIEN PLANT SPECIES	If laydown areas and roads are not rehabilitated, these disturbed areas can become places for alien invasive species to become established, and if left unmitigated, these species can spread and establish themselves in intact vegetation, resulting in the displacement of indigenous species and possible local extinctions of SCC.	DIRECT	STUDY AREA	PERMANENT	DEFINITE	SEVERE	HIGH -	⚡ The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them. ⚡ The prickly pears currently noted on	ACHIEVABLE	LOW -

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	Six exotic species were recorded within the site, one (prickly pear – Opuntia ficus-indica) of which is listed as a Category 1b invasive.							site must be removed and disposed of. ✧ An alien invasive management plan must be incorporated into the EMPr. ✧ The ECO and/or ESCO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.		
	Cumulative Impact: The cumulative impact associated with all known WEFs in the area could increase the infestation of alien invasive plant species in the area if this is not mitigated.									
	The cumulative impact associated with all known WEFs in the area will increase habitat fragmentation which could impact on ecosystem functioning at a larger scale.	CUMULATIVE, DIRECT	NATIONAL	PERMANENT	PROBABLE	MODERATE	HIGH -		IRREVERSIBLE	MODERATE -
	No-Go Alternative: If the project does not go ahead, the vegetation would remain intact and there will be limited disturbance resulting in the infestation of alien species. The impact associated with this will be of low significance.	NO-GO	LOCAL	MAY OCCUR	DEFINITE	MODERATE	LOW -	It is assumed that each WEF will implement mitigation measures to reduce the cumulative impact as a condition of their environmental authorisation.	N/A	
HERITAGE IMPACT ASSESSMENT										
LOSS OF HERITAGE RESOURCE FOR S5WEF01 - S5WEF34	It is understood that no new areas will be disturbed and/or impacted during the operations phase of the project and the risk and severity of heritage impacts should decrease once the projects activate. Furthermore, the majority of sites of archaeological and heritage significance would have been recorded and/or assessed in preceding phases. However, impact on previously undetected archaeological sites, human burials and the cultural landscape might occur as a result of operational activities (site access, movement, maintenance, trespassing, natural elements, hazards etc). During the Operations Phase, continuous ECO and/or ESCO site monitoring will be required.	DIRECT	SHORT TERM	STUDY AREA	UNLIKELY	SLIGHT / SLIGHTLY BENEFICIAL	LOW + /-	No further action / Monitoring Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO and/or ESCO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.	IRREVERSIBLE	LOW +/ -
CUMULATIVE IMPACTS	It is the opinion of the Specialist that the proposed Soyuz 5 Wind Energy Facility and its associated power line connection will have a low negative cumulative impact on the heritage value of the area for the following reasons: - The low frequency of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape. In addition, localised and spatially confined heritage resources can easily be avoided by project design of individual turbines, pylon placements and service roads. - The significance of the landscape in terms of its heritage is bound not to change during the course of construction, operation and decommissioning of the project.	CUMULATIVE	LOCALISED	LONG TERM	UNLIKELY	LOW	LOW -	Site Monitoring: General Site Monitoring in order to detect the presence of and limit impact on previously undocumented heritage receptors during construction / site clearing / earth moving Avoidance This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. Mitigation This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high	REVERSIBLE	LOW -

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	<ul style="list-style-type: none">- The proposed Soyuz 5 WEF is situated in region which has seen the rapid development of vast and large-scale renewable energy facilities such as the Maanhaarberg WEF, the Great Karoo Renewable Energy Facility, the Modderfontein WEF and many Solar PV Developments around the town of De Aar. The developments cumulatively add to a transformed landscape and sense of place where the character of this portion of the Karoo is evolving into a centre for renewable power generation.- It should be noted that archaeological knowledge and the initiation of research projects into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.							<p><i>to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.</i></p> <p><i>Compensation</i> <i>Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.</i></p> <p><i>Rehabilitation</i> <i>Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:</i></p> <ul style="list-style-type: none">- <i>The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.</i>- <i>Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.</i>- <i>Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.</i>		
NOISE IMPACT ASSESSMENT										
DAYTIME OPERATION OF WTG CONSIDERING THE WORST-CASE SPL	WTG will only operate during period with increased winds, when ambient sound levels are higher than periods with no or low winds. As discussed and motivated in section 6.4 (as proposed in Table 6 2 and illustrated in Figure 4 52), ambient sound levels will likely be higher, with this assessment assuming an ambient sound level of 41.5 dBA.	DIRECT	REGIONAL	LONG TERM	PROBABLE	HIGH	MEDIUM -	<ul style="list-style-type: none">✦ <i>The significance of the noise impact is Medium and additional mitigation is required and recommended. Potential mitigation measures would include:</i>✦ <i>Agreement between the applicant and the land owner that the structures near NSR19 will not be used for residential purposes once the project proceed; or</i>✦ <i>The applicant can use WTG within 2,000m from NSR19 with a SPL less of 106.5 dBA (re 1 pW); or</i>✦ <i>The applicant can change the layout, removing WTG B3-09 and B3-10 (or</i>	HIGHLY REVERSIBLE	LOW -
		CUMULATIVE	INSIGNIFICANT						INSIGNIFICANT	
		NO-GO	NO IMPACT						NO IMPACT	

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								<i>relocating both further than 2,000m from this NSR); or</i> ✧ <i>The applicant can change the layout, removing WTG B3-09 or B3-10 (or relocating both further than 2,000m from this NSR). Noise modelling should be undertaken to ensure the total noise levels are less than 45 dBA.</i> ✧ <i>There is no risk of any residual noise.</i>		
NIGHT-TIME OPERATION OF WTG CONSIDERING THE WORST-CASE SPL	WTG will only operate during period with increased winds, when ambient sound levels are higher than periods with no or low winds. As discussed and motivated in section 6.4 (as proposed in Table 6 2 and illustrated in Figure 4 53), ambient sound levels will likely be higher with this assessment assuming an ambient sound level of 41.5 dBA. Numerous WTG of the Soyuz 5 WEF operating simultaneously at night will increase ambient sound levels due to air-borne noise from the WTG. The projected noise levels, the change in ambient sound levels as well as the potential noise impact is defined per NSR in Appendix F, Table 6 (pre-mitigation) and summarized in this table. The potential noise level (and significance) when using a quieter WTG (such as the Nordex N163 5.X WTG with the reported SPL of 107.2 dBA re 1 pW) is presented in Appendix F, Table 7 (post-mitigation) of the Specialist Noise Report).	DIRECT	REGIONAL	LONG TERM	HIGHLY LIKELY	HIGH	HIGH -	<i>The significance of the noise impact is High and additional mitigation is required and recommended. Potential mitigation measures would include:</i> <ul style="list-style-type: none"><i>Agreement between the applicant and the land owner that the structures near NSR19 will not be used for residential purposes once the project proceed; or</i><i>That the applicant designs and implement a noise abatement programme to ensure that the projected noise levels are less than 45dBA at NSR19 (during periods that the structures are used for residential purposes). This could include using a WTG (within 2,000 m from NSR19) that has different sound reduction modes (such as a WTG with a noise emission level less than 106.5 dBA re 1pW); or</i><i>The applicant can use WTG within 2,000m from NSR19 with a SPL less of 106.5 dBA (re 1 pW); or</i><i>The applicant can change the layout, removing WTG B3-09 and B3-10 (or relocating both further than 2,000m from this NSR); or</i><i>The applicant can change the layout, removing WTG B3-09 or B3-10 (or relocating both further than 2,000m from this NSR). Noise modelling should be undertaken to ensure the total noise levels are less than 45 dBA.</i> <i>There is no risk of residual noise.</i>	HIGHLY REVERSIBLE	LOW -
		CUMULATIVE	INSIGNIFICANT						INSIGNIFICANT	
		NO-GO								
POTENTIAL CUMULATIVE NOISE IMPACTS	Numerous WTG from various WEFs (such as the other Soyuz projects) operating simultaneously with increases in ambient sound levels due to air-borne noise from the WTG. The projected noise levels, the potential change in ambient sound levels as well as the significance of the potential noise impact defined per NSR in Appendix F, Table 8(pre-mitigation) of the Specialist Noise Report. Considering the projected noise levels as defined in Appendix F, Table 8 (pre-mitigation) of the Specialist Noise Report, there is a possibility for a noise impact at NSR15 with several WTG from	DIRECT	NO IMPACT					✧ <i>The significance of the potential cumulative noise impact is medium. It must be noted that the cumulative noise impact is the result of several WTG from Soyuz WEF6 that impacts on noise level at NSR15.</i> ✧ <i>There is no risk of residual noise.</i>	NO IMPACT	
		CUMULATIVE	REGIONAL	LONG TERM	HIGHLY LIKELY	HIGH	HIGH -		HIGHLY REVERSIBLE	LOW -
		NO-GO	NO IMPACT						NO IMPACT	

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	Soyuz 6 located within 2,000m from this receptor. The closest WTG (B3-01) of the Soyuz 5 WEF (to NSR15) is ±1,600m away and contributes insignificant acoustic energy (less than 0.5 dBA) to noise levels at this receptor.									
PALAEOLOGICAL IMPACT ASSESSMENT										
None identified by specialist										
SOCIAL IMPACT ASSESSMENT										
POSITIVE ATTITUDE TOWARDS THE DEVELOPMENT	Overall feelings in the town were overwhelmingly positive, and in the surrounding farms feelings were generally positive towards the WEF.	DIRECT	MUNICIPAL	SHORT TO MID TERM	DEFINITE	MODERATE	MODERATE +	<ul style="list-style-type: none">✦ Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.✦ Ensure that notice is given and landowners and locals are properly informed throughout the project.	ACHIEVABLE	MODERATE +
HIGH COMMUNITY EXPECTATIONS FOR BENEFITS RESULTING FROM THE PROJECT	Expectations are high among members of the local community in terms of what the development will offer and contribute, especially where it may improve their livelihoods.	DIRECT	MUNICIPAL	LONG TERM	DEFINITE	MODERATE	MODERATE +	<ul style="list-style-type: none">✦ Good communication about the project needs to be practiced throughout as both locals and businesses need time to plan accordingly for any changes that will occur in the area.✦ Ensure that notice is given and landowners and locals are properly informed throughout the project.✦ A positive relationship must be established and maintained with affected landowners. There should always be an open line of communication and grievances must be addressed satisfactorily and promptly.✦ Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners. Disruptions to directly affected and adjacent landowners must be kept to a minimum.✦ Complaints and concerns must be addressed promptly, and feedback must be given to complainants.	ACHIEVABLE	MODERATE +
JOB CREATION: OPERATION	A number of employment opportunities will be created during the operation phase.	DIRECT, INDIRECT, CUMULATIVE	REGIONAL	LONG TERM	DEFINITE	SEVERE (BENEFICIAL)	HIGH +	<ul style="list-style-type: none">✦ Hiring should focus on the nearest and surrounding community. If not, jealousy and disdain or resentment for the project may develop.✦ Unreasonable expectations with regards to employment opportunities should not be created, and the developers should be transparent about the limited number of employment opportunities that will be created.	ACHIEVABLE	HIGH +
SMME DEVELOPMENT	AHIGs part of the WEF’s LED programme, development of SMMEs may be supported.	DIRECT, INDIRECT AND CUMULATIVE	MUNCIPAL	LONG TERM	POSSIBLE	SEVERE (BENEFICIAL)	HIGH +	<ul style="list-style-type: none">✦ Ensure local SMME’s are utilised throughout the project, as far as possible.	ACHIEVABLE	HIGH +

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								<ul style="list-style-type: none">✦ The creation of secondary opportunities for income generation, such as supplying meals to employees, should be investigated and implemented if possible.✦ External contractors and suppliers from within the local municipality must be given preference.✦ Source materials and products locally, as far as possible.		
POSSIBILITY FOR TRAINING AND UPSKILLING OF LOCAL COMMUNITY DURING CONSTRUCTION, OPERATION AND THROUGH LED PROJECTS	There may be an opportunity to provide training and develop skills during both construction and operation phases. It is anticipated that there may also be such opportunities arising from the WEF's LED programme subsequent to commencement of operation.	DIRECT	MUNICIPAL	LONG TERM	POSSIBLE	MODERATE	MODERATE +	<ul style="list-style-type: none">✦ It is recommended that these be maximised whenever possible, and that the local community, especially, be the beneficiaries of this.	ACHIEVABLE	MODERATE +
IN-MIGRATION OF JOB SEEKERS	A large-scale in-migration of people in search of work is often a concern associated with new developments. However, this usually applies to larger developments, and is not expected to happen in a large scale in the instance of the WEF.	DIRECT	MUNICIPAL	LONG TERM	UNSURE	SLIGHT	LOW -	<ul style="list-style-type: none">✦ No mitigation possible.	N/A	LOW -
NOISE FROM OPERATION	Noise from wind turbines may cause disturbance, especially during night time.	DIRECT	LOCAL	LONG TERM	PROBABLE	MODERATE	MODERATE -	<ul style="list-style-type: none">✦ • Mitigation measures proposed by the Noise specialist must be adhered to.	EASILY ACHIEVABLE	LOW -
THERE MAY BE SENSITIVE HERITAGE FEATURES ON THE SITE THAT MAY BE IMPACTED	There may be sensitive heritage features on the site that may be impacted.	DIRECT	LOCAL	PERMANENT	POSSIBLE	MODERATE	MODERATE -	<ul style="list-style-type: none">✦ Recommendations and mitigation measures contained in the Heritage Impact Assessment must be adhered to.	EASILY ACHIEVABLE	MODERATE -
POSSIBLE REDUCTION IN CRIME RATES	The presence of the project could possibly reduce the rate of petty theft and stock theft in the area. People may also resort less to crime if they obtain legitimate incomes through employment or business opportunities.	DIRECT, INDIRECT, CUMULATIVE	LOCAL	LONG TERM	POSSIBLE	SLIGHT	LOW +	<ul style="list-style-type: none">✦ Measures should be taken to ensure security around any construction site, including maintaining access control onto affected farms.✦ Affected landowners must be consulted and respected in terms of access to the site, security and all activities on the site, in order to minimise negative impacts to landowners.	ACHIEVABLE	LOW +
LOSS OF AGRICULTURAL LAND	A small amount of agricultural land (used for grazing currently) will be lost to the wind turbines and access roads, but this will not be significant.	DIRECT	SUTDY AREA	LONG TERM	POSSIBLE	SLIGHT	LOW -	<ul style="list-style-type: none">✦ N/A	N/A	LOW -
NEGATIVE VISUAL IMPACT AND LOSS OF SENSE OF PLACE	WEFs invariably have a visual impact on an area. Many people perceive this as negative, and as spoiling the sense of place.	DIRECT	SUTDY AREA	LONG TERM	POSSIBLE	MODERATE	MODERATE -	<ul style="list-style-type: none">✦ Mitigation measures suggested by the visual impact specialist must be adhered to.	N/A	MODERATE -
LOSS OF INCOME DUE TO VISUAL IMPACTS	The presence of the WEF may negatively impact a hunting establishment in that international clientele seek the specific aesthetic of the desolate landscape, which will change as a result of the WEF.	DIRECT, INDIRECT AND CUMULATIVE	LOCAL	LONG TERM	POSSIBLE	SLIGHT	LOW -	<ul style="list-style-type: none">✦ N/A	N/A	LOW -
ADDITIONAL SUPPLY OF ENERGY TO THE NATIONAL GRID	There is currently considerable need and demand for additional electrical power and particularly for electricity from renewable and other diverse sources. This project will positively contribute to meeting these needs.	DIRECT, INDIRECT, CUMULATIVE	NATIONAL	LONG TERM	DEFINITE	SEVERE/ BENEFICIAL	HIGH +	<ul style="list-style-type: none">✦ N/A	N/A	HIGH +
TRAFFIC IMPACT ASSESSMENT										
NOISE AND POLLUTION	Very little noise and pollution is expected during the operation of the WEF.	DIRECT	STUDY AREA	SHORT TERM	DEFINITE	SLIGHT	LOW -	<ul style="list-style-type: none">✦ Schedule any trips arising for maintenance of wind turbines or other components outside peak traffic periods.	REVERSIBLE, ACHIEVABLE	LOW -
TRAFFIC IMPACTS	Trips for the operational phase will be limited to permanent staff and maintenance.	DIRECT	REGIONAL	SHORT TERM	DEFINITE	SLIGHT	LOW -		REVERSIBLE, ACHIEVABLE	LOW -

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TRAFFIC IMPACTS AND ASSOCIATED NOISE AND DUST POLLUTION	The cumulative impact assumes that all approved developments will be operational at the same time, which would increase noise, pollution and traffic on surrounding road network.	CUMULATIVE	REGIONAL	LONG TERM	POSSIBLE	MODERATE	MODERATE -		IRREVERSIBLE	LOW -
VISUAL IMPACT ASSESSMENT										
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY (< 5KM) TO THE PROPOSED DEVELOPMENT	<p>The visual impacts of facility operations on sensitive visual receptors in close proximity to the proposed Soyuz 5 WEF (within 5km) is expected to be of very high significance. Sensitive receptors in this zone consist of observers travelling along the R398, various secondary and internal farm roads, as well as residents of various homesteads (refer to Section 6.6 for a full list).</p> <p>Homesteads located on farm portions earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts).</p> <p>Cumulative: The construction of the Soyuz 5 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.</p> <p>Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.</p>	DIRECT	NEIGHBOUR HOOD	LONG TERM	DEFINITE	VERY HIGH	VERY HIGH -	<p>✚ Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.</p> <p>✚ Maintain the general neat and tidy appearance of the facility as a whole.</p> <p>✚ Monitor rehabilitated areas, and implement remedial action as and when required</p>	REVERSIBLE	VERY HIGH -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section							
		NO-GO	NO IMPACT							
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE LOCAL AREA (BETWEEN 5 - 10KM) SURROUNDING THE PROPOSED DEVELOPMENT	<p>The visual impact of facility operations on sensitive visual receptors (i.e. users of the various roads and residents of homesteads) within the local area (between 5 - 10km offset) is expected to be of high significance. Sensitive visual receptors within this zone include users traveling along the R398 and various secondary roads in the area, as well as residents of various homesteads (refer to Section 6.6 for a full list).</p> <p>Homesteads located on farm portions earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts).</p> <p>Cumulative impact: The construction of the Soyuz 5 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.</p> <p>Residual Impact: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.</p>	DIRECT	LOCALISED	LONG TERM	DEFINITE	HIGH	HIGH -	<p>✚ Site development & Operation:</p> <p>✚ Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.</p> <p>✚ Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.</p> <p>✚ Dust suppression techniques should be in place at all times during the site development and operational phases.</p> <p>✚ Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.</p> <p>✚ Keeping infrastructure at minimum heights.</p> <p>✚ Introducing landscaping measures such as vegetating berms.</p> <p>✚ Avoid the use of highly reflective material.</p> <p>✚ Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the</p>	REVERSIBLE	HIGH -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section							
		NO-GO	NO IMPACT							

SYNTHESIS OF SPECIALIST IMPACTS AS EXTRACTED FROM THE SPECIALIST REPORTS										
ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (PROBABILITY/ LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	REVERSABILITY/ MITIGATION	SIGNIFICANCE POST-MITIGATION
								<ul style="list-style-type: none">✦ Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.✦ Wherever possible, lights should be directed downwards to avoid illuminating the sky.✦ Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.		
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE REGION (> 20KM)	The visual impact of facility operations on sensitive visual receptors within the region (beyond the 20km offset) is expected to be of low significance. Sensitive visual receptors within this zone include users traveling along portions of the N12 and R398, as well as residents of various homesteads (refer to Section 6.6 for a full list). Homesteads located on farm portions earmarked for the Britstown Wind Farm Cluster reduce the probability of this impact occurring on these specific receptors (i.e. it is assumed that these landowners are supportive of WEF developments and their associated visual impacts). Cumulative: The construction of the Soyuz 5 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region. Residual Impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.	DIRECT	REGIONAL	LONG TERM	PROBABLE	LOW	LOW -	Site development & Operation:	REVERSIBLE	LOW -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section					<ul style="list-style-type: none">✦ Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.		
		NO-GO	NO IMPACT					<ul style="list-style-type: none">✦ Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.✦ Dust suppression techniques should be in place at all times during the site development and operational phases.✦ Access roads will require an effective dust suppression management programme, such as regular wetting and/or the use of non-polluting chemicals that will retain moisture in the road surface.✦ Keeping infrastructure at minimum heights.✦ Introducing landscaping measures such as vegetating berms.✦ Avoid the use of highly reflective material.✦ Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.✦ Maintain the general neat and tidy appearance of the site as a whole.✦ <u>Lighting</u>✦ Lighting should be kept to a minimum wherever possible.✦ Install light fixtures that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.		

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								<ul style="list-style-type: none">✦ Wherever possible, lights should be directed downwards to avoid illuminating the sky.✦ Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.		
POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION	<p>The receiving environment has a relatively small number of populated places, and it can be expected that any light trespass and glare from the security and after-hours operational lighting for the facility will have some significance. In addition, the remote sense of place and rural ambiance of the local area increases its sensitivity to such lighting intrusions.</p> <p>Another source of glare light is the aircraft warning lights mounted on top of the hub of the wind turbines. While these lights are less aggravating due to the toned-down red colour, they do have the potential to be visible from a greater distance than general operational lighting, especially due to the strobing effect of the lights, a function specially designed to attract the viewers’ attention. The Civil Aviation Authority (CAA) prescribes these warning lights and the potential to mitigate their visual impacts is low. The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, is recommended to be investigated.</p> <p>Some ground breaking new technology in the development of strobing lights that only activate when an aircraft is detected nearby. This may aid in restricting light pollution at night and should be investigated and implemented by the project proponent, if available and permissible by the CAA. This new technology is referred to as <i>needs-based night lights</i>, which basically deactivates a wind turbine’s night lights when there is no flying object within the airspace of the WEF. The system relies on the active detection of aircraft by radar sensors, which relay a switch-on signal to the central wind farm control to activate the obstacle lights.</p> <p>Last is the potential lighting impact is known as sky glow. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. Each new light source, especially upwardly directed lighting, contributes to the increase in sky glow. The general lighting of the facility may contribute to the effect of sky glow in an otherwise dark environment.</p> <p>The visual impacts as a result of operational lighting at night on sensitive visual receptors in the region is likely to be of high significance and may be mitigated to moderate should the required CAA lighting be approved to be installed on the perimeter and/or the installation of <i>needs-based night lights</i> be allowed. Best practice guidelines for other general site lighting that may occur on the site have also been taken into consideration. The table below illustrates this impact assessment.</p> <p>Cumulative impacts: The operation of the Soyuz 5 WEF (75</p>	DIRECT	REGION	LONG TERM	DEFINITE	VERY HIGH	HIGH -	Planning & operation:	MODERATE	MODERATE -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section					<ul style="list-style-type: none">✦ Aviation standards and CAA Regulations for turbine lighting must be followed.✦ The possibility of limiting aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact, must be investigated.✦ Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.✦ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).✦ Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.✦ Make use of minimum lumen or wattage in fixtures.✦ Make use of down-lighters, or shielded fixtures.✦ Make use of Low-Pressure Sodium lighting or other types of low impact lighting.✦ Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.		
		NO-GO	NO IMPACT							

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	turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased lighting and light pollution in an otherwise natural area increasing the cumulative visual impact of renewable energy facilities in the region. Residual Impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.									
POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	This Impact is described above. Shadow flicker only occurs when the sky is clear, and when the turbine rotor blades are between the sun and the receptor (i.e. when the sun is low). De Gryse in Scenic Landscape Architecture (2006) found that “most shadow impact is associated with 3-4 times the height of the object”. Based on this research, a 1km zone around each turbine has been identified as the zone within which there is a risk of shadow flicker occurring. Three homesteads, Schramfontein, Gediertesfontein and Beskuitkuil, are located within the 1km buffer. Of note is that these homesteads are located on properties involved in this development, thereby reducing the probability of this impact occurring. It is expected that motorists travelling along roads within the 1km zone of a turbine could potentially experience shadow flicker, however the shadow flicker experienced by these motorists will be fleeting and not constitute a shadow flicker visual impact of concern. Residual impact: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.	DIRECT	NEIGHBOUR HOOD	LONG TERM	HIGHLY PROBABLE	HIGH	HIGH -	✦ <u>Planning & operation:</u> ✦ Adjust wind turbine locations to reduce the number of receptors likely to experience shadow flicker. ✦ Consult with participating landowners or identified receptors who may experience shadow flicker impacts to identify feasible and reasonable management and mitigation measures, should they be required. ✦ Installation of screening structures and/ or planting of trees to block shadows cast by the turbines on the identified affected receptors. ✦ Investigate the use of turbine control strategies which shut down the offending turbines when shadow flicker is likely to occur on identified receptors is investigated.	RECOVERABLE, DIFFICULT	MODERATE -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section							
		NO-GO	NO IMPACT							
ANCILLARY INFRASTRUCTURE	On-site ancillary infrastructure associated with the Soyuz 5 WEF includes a permanent laydown area, Battery Energy Storage System (BESS), internal overhead lines between the substations, permanent met masts, three on-site substations, access roads to and between project components inclusive of stormwater infrastructure, as well as operation and maintenance buildings, including a gate house, security building, control centre, offices, warehouses and workshops, etc. No dedicated viewshed analyses have been generated for the ancillary infrastructure, as the range of visual exposure will fall within (and be overshadowed by) that of the turbines. Residual Impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.	DIRECT	NEIGHBOUR HOOD	LONG TERM	PROBABLE	MODERATE	MODERATE -	✦ Maintain the general neat and tidy appearance of the infrastructure.	RECOVERABLE, DIFFICULT	MODERATE -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section							
		NO-GO	NO IMPACT							
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION	Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.) play a significant role. A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the	DIRECT	REGION	LONG TERM	DEFINITE	HIGH	HIGH -	✦ <u>Planning:</u> ✦ Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint. ✦ Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. ✦ Use existing roads wherever possible. Where new roads are	REVERSIBLE	HIGH -
		CUMULATIVE	Cumulative impact ratings have been scored at the end of the visual impact assessment section							
		NO-GO	NO IMPACT							

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	<p>environment differently, and more specifically, in a less appealing or less positive light.</p> <p>In general, the landscape character of the greater study area and site itself presents as rural in character with wide open, undeveloped landscapes. The visual quality of the region is generally high with tracts of intact vegetation as well as, hills and rocky outcrops characterising most of the visual environment. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation.</p> <p>Cumulative impacts: The construction and operation of the Soyuz 2 WEF (75 turbines) together with the other five proposed facilities that form part of the Britstown Wind Farm Cluster is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.</p> <p>Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.</p>							<p><i>required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible, and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.</i></p> <ul style="list-style-type: none">✧ <u>Construction:</u>✧ <i>Rehabilitate all construction areas.</i>✧ <i>Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.</i>✧ <u>Operations:</u>✧ <i>Maintain the general neat and tidy appearance of the facility as a whole.</i>✧ <i>Monitor rehabilitated areas, and implement remedial action as and when required.</i>✧ <u>Decommissioning:</u>✧ <i>Remove infrastructure not required for the post-decommissioning use of the site.</i>✧ <i>Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.</i>✧ <i>Monitor rehabilitated areas post-decommissioning and implement remedial actions.</i>		
POTENTIAL CUMULATIVE VISUAL IMPACT OF WIND ENERGY FACILITIES WITHIN THE REGION	It is a requirement that a visual specialist identify and quantify the cumulative visual impacts of a proposed development, propose potential mitigating measures and conclude if the proposed development will result in any acceptable loss of visual resources taking into consideration the other proposed and operational projects in the area. A cumulative visual impact can be defined as the combined or incremental effects resulting from changes caused by a proposed development in conjunction with other existing or proposed activities. The cumulative impact assessed in the table below will consist of the combined impact of the proposed Soyuz 5 WEF and the five other proposed facilities that form part of the Britstown Wind Farm Cluster.	DIRECT	N/A					None are available.	N/A	
		CUMULATIVE: Overall impact of the proposed project considered in isolation	REGION	LONG TERM	HIGHLY PROBABLE	HIGH	MODERATE -		REVERSIBLE, VERY DIFFICULT	
		CUMULATIVE: Cumulative impact of the project and other projects in the area	REGION	LONG TERM	DEFINITE	VERY HIGH	HIGH -		REVERSIBLE, VERY DIFFICULT	
		NO-GO	NO IMPACT						N/A	
	<p>Cumulative visual impacts may be experienced as a result of where a combination of several WEF’s turbines is within a receptors line of sight at the same time, where the receptor has to turn their head to see several of the turbines of the different WEF’s or when the receptor has to move from one viewpoint to another to either see different developments or different views of the same development (such as when travelling along a road).</p> <p>The cumulative visual impact is not just the totality of the impacts of two developments. The combined impact may be greater than the sum of the two individual developments, or in rare cases even less. The cumulative visual impact is assessed as the product of the</p>									

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	<p>distance between the individual WEFs (or turbines), the total distance over which the turbines are visible, the general character of the landscape and its sensitivity to that specific typology of development, the location and design of the WEFs themselves and lastly the way in which the landscape is experienced by the sensitive receptors.</p> <p>The cumulative visual impacts are likely to be of high significance when the proposed Soyuz 5 WEF and the five other proposed facilities that form part of the Britstown Wind Farm Cluster are in operation.</p> <p>Residual impact: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.</p>									
<p align="center">DECOMMISSIONING PHASE</p> <p align="center">**DUE TO THE FACT THAT NO WIND ENERGY FACILITY'S HAVE BEEN DECOMMISSIONED IN SOUTH AFRICA, CES BELIEVES IT RESPONSIBLE TO STIPULATE THAT FUTHER ASSESSMENT IN THE FORM OF A DECOMMISSIONING ENVIRONMENTAL MANAGEMENT PROGRAMME BE DRAFTED, IN CONSULTATION WITH SPECIALISTS, WHEN THIS PHASE BECOMES RELEVANT.</p>										
AQUATIC IMPACT ASSESSMENT										
<i>The aquatic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										
AVIFAUNAL IMPACT ASSESSMENT										
<i>The avifaunal impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										
BAT IMPACT ASSESSMENT										
<i>The bat impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										
ECOLOGICAL IMPACT ASSESSMENT										
<i>The ecological impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										
HERITAGE IMPACT ASSESSMENT										
<i>None identified by specialist</i>										
NOISE IMPACT ASSESSMENT										
<i>The noise impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										
PALAEONTOLOGICAL IMPACT ASSESSMENT										
<i>None identified by specialist</i>										
SOCIAL IMPACT ASSESSMENT										
<i>The socio-economic impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										
VISUAL IMPACT ASSESSMENT										
<i>The visual impacts associated with the decommissioning phase will be similar to those listed in the construction phase and the associated mitigations measures must be updated and implemented to reduce potential adverse impacts.</i>										