ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
PLANNING & DESIGN PHASE									
AGRICULTURE & SOILS IMPACT ASSESSMENT									
PLACEMENT OF TURBINES	To evaluate the placing of turbines and the lay-out thereof (mainly on turbine footprints and new roads anticipated) on existing agricultural land given the natural resource (soil, terrain and climate) circumstances unique to the area. Water erosion was determined as the most important factor in the area. Evaluation included suggested mitigation measures against water erosion for lay-down areas and water run-off lanes along new roads planned. Assessment also focused on areas where roads will cross existing contours.	**DIRECT**	**LOCALISED**	**PERMANENT**	**DEFINITE**	**VERY SEVERE**	**HIGH -**	*Stabilizing of lay-down areas, water run-off lanes along roads and where contours are crossed, appropriate structures to be implemented to make sure they are still functioning well and to prevent any further activity that may be responsible for new water erosion to take place.* *Details of mitigation measures to take into consideration per turbine placing are given in Annexure 1, Tables 6.1 and 6.2 of the Agriculture & Soils Impact Assessment report.*	**LOW -**
AVIFAUNAL IMPACT ASSESSMENT									
None identified by specialist									
BAT IMPACT ASSESSMENT									
None identified by specialist									
ECOLOGICAL IMPACT ASSESSMENT									
None identified by specialist									
ECONOMIC IMPACT ASSESSMENT									
None identified by specialist									
FRESHWATER IMPACT ASSESSMENT									
None identified by specialist									
HERITAGE, ARCHAEOLOGY & PALAEONTOLOGY IMPACT ASSESSMENT									
VISUAL IMPACTS ON HERITAGE RESOURCES	Visual impact on scenic qualities of the Vredenburg-Stompneus Bay Road, the Paternoster-Stompneus Bay Road and the built environment heritage of Rooiheuwel and Boebesakskraal farmsteads.	**INDIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**VERY SEVERE**	**VERY HIGH -**	*Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.* *All wind turbine positions west of the Vredenburg-Paternoster Road (13 in total) must be relocated to the east (or removed). In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**MODERATE -**
CUMULATIVE VISUAL HERITAGE RESOURCES	Visual impact on the historic farmsteads, observers on local roads with scenic qualities, the rural cultural landscape and the archaeological site of Kasteelberg resulting from the densification of wind turbines and expansion of area under wind farm infrastructure.	**CUMULATIVE**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**SEVERE**	**HIGH -**	*All wind turbine positions west of the Vredenburg-Paternoster Road (13 in total) must be relocated to the east (or removed). In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**MODERATE -**
NOISE IMPACT ASSESSMENT									
None identified by specialist									
SOCIAL IMPACT ASSESSMENT									
None identified by specialist									
TRAFFIC IMPACT ASSESSMENT									
None identified by specialist									
VISUAL IMPACT ASSESSMENT									
CLOSE PROXIMITY	Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.*	**HIGH -**

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RESIDENTS & VISITORS - OPERATIONAL	(i.e. within 5km) to the wind turbine structures.								
ROAD USERS	Visual impact on observers travelling along the roads in close proximity (i.e. within 5km) to the wind turbine structures.	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.*	**HIGH -**
KASTEELBERG HILL	Visual impact of wind turbines (west of the Vredenburg-Stompneus Bay road) obstructing views of the Kasteelberg hill and Atlantic seaboard at Paternoster (from this road).	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*All wind turbine positions west of the Vredenburg-Paternoster Road (13 in total) must be relocated to the east (or removed). In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**LOW -**
MODERATE PROXIMITY RESIDENTS & VISITORS	Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity (i.e. within 5km – 10km) to the wind turbine structures.	**DIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**HIGH -**	*Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.*	**HIGH -**
CLOSE PROXIMITY RESIDENTS & VISITORS - CONSTRUCTION	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed BWF.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*Retain and maintain natural vegetation in all areas outside of the development footprint.*	**LOW -**
LIGHTING - OPERATIONAL	Impact table summarising the significance of visual impact of lighting at night on visual receptors in close to medium proximity to the proposed BWF.	**DIRECT**	**LOCALISED / REGIONAL**	**LONG TERM**	**DEFINITE**	**SEVERE**	**HIGH -**	*Limit aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact.* *Investigate aircraft warning lights that only activate when the presence of an aircraft is detected.* *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.*	**MODERATE -**
ANCILLARY INFRASTRUCTURE	Visual impact of the ancillary infrastructure on observers in close proximity to the structures.	**DIRECT**	**LOCALISED**	**LONG TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.*	**LOW -**
SENSE OF PLACE	The potential impact on the sense of place of the region.	**INDIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.*	**MODERATE -**
VISUAL QUALITY OF THE LANDSCAPE	The potential cumulative visual impact of the wind farms on the visual quality of the landscape.	**DIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**SEVERE**	**HIGH -**	*All wind turbine positions west of the Vredenburg-Paternoster Road (13 in total) must be relocated to the east (or removed). In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**HIGH -**
CONSTRUCTION PHASE									
AGRICULTURE & SOILS IMPACT ASSESSMENT									
None identified by specialist									
AVIFAUNAL IMPACT ASSESSMENT									
HABITAT LOSS	Destruction of natural vegetation areas due to platform construction, workstation and substation construction, internal access roads construction, and	**DIRECT**	**LOCALISED**	**SHORT TERM**	**DEFINITE**	**MODERATELY SEVERE**	**MODERATE -**	*The minimisation of this impact is mainly achieved through the avoidance of infrastructure siting, especially turbines, in the no-go areas, in the layout planning phase, or through the minimisation of the affected areas as far as possible in the activities of clearance and removal of vegetation.*	**LOW -**

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	turbines, underground cabling and overhead power lines installation							*Existing roads and infrastructure should be used in order to minimise landscape changes. If large portions of no-go areas are affected through the construction of roads etc. (the construction of wind turbines is not possible in these areas), measures should be taken to restore vegetation as soon as possible after construction is completed.* *Movements of machinery, vehicles and persons should be restricted to the existing roads and avoid the existing natural areas.*	
DISTURBANCE / DISPLACEMENT EFFECTS	Disturbance and/or displacement effects due to construction works, noise, human presence and machinery movements	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*In order to minimise this impact certain measures can be taken, such as avoiding the presence of people and vehicles in the no-go areas as far as possible; whenever possible schedule activities in order to avoid disturbance during the breeding season if any confirmed nests are identified within the study area – the breeding season interruption must be adjusted to the species ecology; lower the levels of noise whenever possible and avoid the destruction or disturbance of identified important features, including waterbodies and/or nests.* *In terms of the Secretarybird nest, 500m around this nest must be considered as a NO-GO area for wind turbine placement. A 2000m buffer should also be considered as a medium sensitive zone around this nest. This requires monitoring (by an ECO) during the construction period (within the buffered area) to identify whether or not the nest is in fact still is use. If confirmed to be in use, then risk situations should be identified that would warrant the reduction of construction operations within the buffered area, temporarily.*	**LOW -**
BAT IMPACT ASSESSMENT									
DISTURBANCE DURING ROOSTING	During construction, bats which use natural roost locations that are less buffered against noise and dust (such as in trees and rock crevices) may be disturbed by blasting and the production of dust and noise and abandon their roosts. This may affect the survival of these bats if suitable alternative roosts are not found quickly. This also exposes the bats to daytime predation. Furthermore, disturbance of bats when they are in torpor may adversely affect their energy reserves and therefore survival. This is particularly relevant during winter months. There are many natural bat roost locations on site which do not provide extensive buffering against noise and dust, such as trees and rock crevices.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*This impact can be avoided/ minimised if rocky outcrops and stands of tall trees are avoided and if blasting is avoided and/or minimised.*	**LOW -**
DESTRUCTION OF BAT ROOSTS	Direct Impacts on rocky outcrops or trees could disturb or destroy roosts used by crevice-roosting bats. Such activities could also directly result in the fatality of bats roosting within such an outcrop / tree. There are many rocky	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*This impact can be avoided/ minimised if construction at rocky outcrops is avoided and no trees are destroyed during construction.*	**LOW -**

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	outcrops and trees scattered across the site which provide potential roosts for crevice roosting bats.								
LOSS OF HABITAT	Removal of natural vegetation during the construction phase will alter the foraging habitat of local insectivorous bats, as patches of natural vegetation between agricultural lands are important foraging areas for these bats. Much of the site is used for crops and therefore this impact will be minimal, as insect abundances should be lower over arable land than over natural vegetation, although bats have been shown to forage over agricultural land (Russ & Montgomery, 2002; Cleveland et al., 2006; Sirami et al., 2013). This impact is possible at all patches of natural vegetation, which are scattered across the site.	**DIRECT**	**LOCALISED**	**MEDIUM TERM**	**DEFINITE**	**MODERATELY SEVERE**	**MODERATE -**	• *This impact may be avoided by siting turbines away from areas of natural vegetation.*	**LOW -**
INADVERTENT PROVISION OF NEW BAT ROOSTS	The construction of new buildings and possibly the turbine towers may provide additional roost sites for those species of bat that roost in man-made structures. This may promote bat activity within the WEF and in close proximity to wind turbines, which may, in turn, put bats at risk of turbine-induced mortality (see below). This impact is possible at all locations of newly constructed windfarm buildings.	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	• *Impact may be fully avoided by bat proofing all new structures constructed at the facility.*	**LOW -**
ECOLOGICAL IMPACT ASSESSMENT									
DESTRUCTION / DISTURBANCE OF INTACT VEGETATION	Impacts on vegetation could occur due to disturbance and vegetation clearing associated with the construction of the facility. Although the footprint largely avoids intact areas, some parts of the development are in close proximity to intact areas and some impact could potentially occur.	**DIRECT INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	• *No infrastructure such as new roads should traverse intact strandveld patches. Where there are existing roads through these areas, these are likely to be acceptable, but should be confirmed as not impacting any species of concern during the preconstruction walk-through of the facility.* • *The final layout including roads and underground cables should be subject to a preconstruction walk-through before construction commences and adjusted where required.* • *All intact fragments should be considered no-go areas for vehicles as well as personnel during construction.* • *All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving is to be allowed.* • *Temporary laydown areas should be located within previously transformed areas or areas that have been identified as being of low sensitivity (as is currently the case for the assessed layout).*	**LOW -**
	Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction. Due to noise and operation of heavy machinery,	**DIRECT INDIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	• *Site access should be controlled and no unauthorised persons should be allowed onto the site.* • *All intact strandveld patches should be considered no-go areas for vehicles and personnel.*	**LOW -**

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	faunal disturbance will extend well beyond the footprint and extend into adjacent intact areas, even though there will be no direct habitat loss in these areas. This will be transient and restricted to the construction phase.							*Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.* *The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the demarcated construction site.* *Fires should not be allowed on site.* *All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.* *All construction vehicles should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.* *If any parts of the facility are to be fenced, then no electrified strands should be placed within 30cm of the ground as some species such as tortoises are susceptible to electrocution from electric fences as they do not move away when electrocuted but rather adopt defensive behaviour and are killed by repeated shocks.*	
ECONOMIC IMPACT ASSESSMENT									
GDP-R	Increase in economic activity during construction.	**DIRECT INDIRECT**	**REGIONAL**	**SHORT TERM**	**DEFINITE**	**SLIGHTLY BENEFICIAL**	**MODERATE +**	*Undertake an audit of local SMMEs that could be used to provide selected services and goods during construction* *Contract as many local SMMEs as possible, without jeopardising the viability of the project*	**MODERATE +**
EMPLOYMENT	Creation of temporary employment opportunities during construction	**DIRECT**	**REGIONAL**	**SHORT TERM**	**DEFINITE**	**MODERATELY BENEFICIAL**	**MODERATE +**	*Employ labour-intensive methods in construction, where feasible, to increase the number of unskilled and low skilled people benefitting from the project's development* *Undertake a skills audit in the nearby towns of Paternoster, St Helena Bay and Vredenburg and identify the local skills that could be used during the construction phase* *Employ the local labour, based on their skills and capabilities, as far as feasible*	**MODERATE +**
HOUSEHOLD INCOME	Increased household income and living standards for a temporary period (construction phase).	**DIRECT INDIRECT**	**REGIONAL**	**SHORT TERM**	**PROBABLE**	**MODERATELY BENEFICIAL**	**MODERATE +**	*Employ from the local labour pool as far as feasible* *Identify potential candidates from the local labour pool during construction and train them in time for the start of operations*	**MODERATE +**
GOVERNMENT REVENUE	Effect on government revenue due to initial investment into the project.	**DIRECT**	**NATIONAL**	**SHORT TERM**	**DEFINITE**	**SLIGHTLY BENEFICIAL**	**MODERATE +**	*Increase procurement of goods and services from within South Africa as far as feasible.*	**MODERATE +**
FRESHWATER IMPACT ASSESSMENT									
HABITAT AND ECOLOGICAL STRUCTURE LOSS	FLOODPLAIN WETLAND Site clearing and the removal of freshwater habitat. Compaction of soils, specifically within gravel roads and the proposed crane pads. Site clearing and disturbance of soils, especially due to the high erodibility of soils identified within the CVBWs. Potential indiscriminate movement of construction vehicles within the freshwater features. Potential disposal of waste and construction material	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**DEFINITE**	**SLIGHT**	**MODERATE -**	*All freshwater features should be demarcated as a no-go area, unless at authorised crossing points.* *It is highly recommended that an alien vegetation management plan be compiled during the planning phase and implemented concurrently with the commencement of construction.* *Construction vehicles must be confined to designated roadways and the indiscriminate movement of construction vehicles through terrestrial or wetland habitat falling outside of the construction footprint must be strictly prohibited. This is specifically true for the floodplain wetland where various faunal species have been identified.* *Storage of equipment and materials must remain within the designated construction areas and may not be left in unauthorised areas.*	**LOW -**

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	within the freshwater features. • Potential proliferation of alien and invasive species within the freshwater features.							• *Where crossings are required, they should cross the system at right angles, as far as possible to minimise impacts on the receiving environment, and any areas where bank failure is observed due to the effects of such crossings should be immediately repaired by reducing the gradient of the banks to a 1:3 slope and where necessary, installing support structures. This should only be necessary if existing access roads are not utilised. Construction of these road should follow the design criteria as presented in Appendix E (see Freshwater Impact Assessment report).* • *During the construction of the new road crossing, a buffer of no more than 5m on either side of the proposed road reserve may be impacted. This area must be cordoned off and no vehicles or personnel are permitted outside of the authorised construction area.* • *Any exposed soils, specifically where the slope is steeper must be protected by means of covering with a geotextile such as hessian sheeting or Geojute, and/ or stabilised with sandbags.* • *Regular spraying of non-potable water or, given the current drought conditions, through the use of chemical dust suppressants to reduce dust must be considered mandatory so as to ensure no smothering of wetland vegetation occurs from excessive dust settling.* • *Any stockpiling of materials may not exceed two (2) metres in height so as to reduce materials being blown away during high wind velocity events.* • *All alien and invasive vegetation should be removed. Any vegetation removed should be taken to a registered landfill site so as to prevent proliferation of alien and invasive species.* • *Avoid unnecessary site clearing/vegetation clearing as far as possible.* • *All exposed soils should be revegetated as soon as possible in order to prevent erosion and loss of topsoil.* • *Any cement mixing should be done within the designated batching area only and must not be mixed within or near any freshwater features or within the 32m zone of regulation.* • *Measures must be put in place to control illegal dumping of construction waste as this may result in the pollution of surface water run-off. Furthermore, no pollution of groundwater resources may occur.* • *Concurrent rehabilitation of the freshwater areas impacted by the proposed wind farm is to take place and footprint areas should be minimised as far as possible.*	
	CHANNELLED VALLEY BOTTOM WETLAND • As described above	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**DEFINITE**	**SLIGHT**	**MODERATE -**		**LOW -**
	IMPAIRED HILLSLOPE SEEP • As described above.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**		**LOW -**
	INTACT HILLSLOPE SEEP • As described above.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**		**LOW -**
ECOLOGICAL & SOCIO-CULTURAL SERVICE PROVISION	FLOODPLAIN WETLAND • Site clearing and further vegetation removal impacting on the biodiversity maintenance of the freshwater environment, the sediment balance and ability to control erosion. • Potential alteration of the hydrological regime, specifically with proposed road crossings, thereby impacting on flood	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**MODERATE -**	• *As described above.* • *During normal rainfall conditions the floodplain wetland was observed to have surface water, therefore to prevent upstream ponding as a result of road crossings and to prevent large construction vehicles from getting stuck it is recommended that box culverts be utilised to cross the watercourse with culverts spanning the entire width if the watercourse in order to ensure the spreading of flow and recharge across the width of the HGM Unit. This is considered essential for the road crossing proposed between turbines 35 and 37.*	**LOW -**

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	attenuation and streamflow regulation capabilities. • Potential loss of phosphate, nitrate and toxicant removal due to vegetation clearing. • Loss of vegetation resulting in a reduction in breeding and foraging habitat for faunal species. • Potential changes to water quality as a result of oil spillage from construction vehicles or concrete spills.							• *It is strongly recommended that alien and invasive species be cleared from the freshwater features as part of the wind farm development. This clearing should focus on the greater freshwater network and not only selective areas.* • *Various faunal species were identified to utilise the freshwater features, specifically the large floodplain wetland.*	
	CHANNELLED VALLEY BOTTOM WETLAND • As described above.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**MODERATE -**		**LOW -**
	IMPAIRED HILLSLOPE SEEP • As described above.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**		**LOW -**
	INTACT HILLSLOPE SEEP • As described above.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**		**LOW -**
HYDROLOGICAL FUNCTION & SEDIMENT BALANCE	FLOODPLAIN WETLAND • Site clearing and further removal of vegetation resulting in increased runoff which leads to erosion and alteration of the geomorphology of the freshwater resources. • Excavations of the highly erodible soils, leading to canalization of the freshwater resources, sheet erosion and gully formation. • Movement of construction vehicles within the freshwater environments resulting in soil compaction. • Topsoil stockpiling adjacent to the freshwater resources and runoff from stockpiles leading to sedimentation of the system. • Streamflow diversion and draining water from the freshwater resources resulting in the alteration of hydrological zones.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**MODERATE -**	• As described in the two sections above • Since the floodplain wetlands and channelled valley bottom wetlands are likely to convey more water during the wet winter months, it is imperative that the construction of the proposed new gravel roads be prioritised during the drier summer months. • It is strongly recommended that all existing roads crossings over the wetland features be assessed and culverts upgraded where necessary to improve the hydrological functioning of the systems within the larger project area. • Various road crossings were identified during the site visit where only pipe culverts were utilised. Box culverts are preferred as this allows for water dispersion across the HGM unit while pipe culverts often result in erosion and gully formation due to concentrated flows and insufficient energy dissipation downgradient.	**LOW -**
	CHANNELLED VALLEY BOTTOM WETLAND • As described above.	**DIRECT INDIRECT CUMULATIVE**	**PROJECT AREA**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**MODERATE -**		**LOW -**
	IMPAIRED HILLSLOPE SEEP • As described above.	**DIRECT INDIRECT CUMULATIVE**	**LOCALISED**	**SHORT TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**		**LOW -**
	INTACT HILLSLOPE SEEP • As described above.	**DIRECT INDIRECT**	**LOCALISED**	**SHORT TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**		**LOW -**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
		CUMULATIVE							
HERITAGE, ARCHAEOLOGY & PALAEONTOLOGY IMPACT ASSESSMENT									
PALEONTOLOGICAL RESOURCES	Excavations into the bedrock may expose and destroy paleontological resources of scientific value. Impacts to palaeontology are not expected as the proposed layout has been designed to avoid areas considered to be of a high paleontological value.	**DIRECT**	**LOCALISED**	**PERMANENT**	**UNLIKELY**	**SLIGHT**	**LOW -**	*As the design of the development footprint avoids the paleontologically sensitive deposits located in the wider Project Site, and is restricted to the unfossiliferous granite hills, no impacts are expected and no mitigation is necessary.* *Given the proximity of potentially fossiliferous deposits to the development footprint and the consequent possibility of fossils being encountered during construction activity, a Chance Fossil Finds Procedure should be implemented and included in the EMPr.*	**LOW -**
PHYSICAL ARCHAEOLOGICAL RESOURCES	Impacts on physical archaeological sites during the construction of the Boulders Wind Farm and associated infrastructure. Impacts on archaeology are not expected as the proposed layout has been designed to avoid sensitive areas.	**DIRECT**	**LOCALISED**	**PERMANENT**	**PROBABLE**	**SLIGHT**	**LOW -**	*Every effort has been made to design the layout to avoid sensitive areas, however accidental impacts during construction are possible, in which case the find must be reported to an archaeologist/ Heritage Western Cape for assessment and action.*	**LOW -**
PHYSICAL BUILT ENVIRONMENT HERITAGE RESOURCES	Impacts on the physical built environment heritage resources during the construction of the Boulders Wind Farm and associated infrastructure. Impacts to the built environment are not expected as the proposed layout has been designed to avoid sensitive areas.	**DIRECT**	**LOCALISED**	**PERMANENT**	**UNLIKELY**	**MODERATELY SEVERE**	**LOW -**	*Every effort has been made to design the layout to avoid the sensitive built environment, however accidental impacts during construction are possible, in which case the issue must be reported to an archaeologist/Heritage Western Cape.*	**LOW -**
KNOWN CEMETRIES AND GRAVES	Impacts on known cemeteries and graves during the construction of the Boulders Wind Farm and associated infrastructure. Impacts to graves and cemeteries are not expected as the proposed layout has been designed to avoid the sensitive areas.	**DIRECT**	**LOCALISED**	**PERMANENT**	**UNLIKELY**	**SEVERE**	**LOW -**	*Every effort has been made to design the layout to avoid known graves. The new access road proposed near the Lombard graveyard should be moved west to avoid impacts resulting from the construction and use of the road.*	**LOW -**
VISUAL IMPACTS ON HERITAGE RESOURCES	Visual impact on scenic qualities of the Vredenburg-Stompneus Bay Road, the Paternoster-Stompneus Bay Road and the built environment heritage of Rooiheuwel and Boebesakskraal farmsteads.	**INDIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**VERY SEVERE**	**VERY HIGH -**	*Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**MODERATE -**
CUMULATIVE PALAEONTOLOGICAL RESOURCES	Cumulative impacts to palaeontology are expected to be low as the proposed layout has been designed to avoid sensitive areas	**CUMULATIVE**	**LOCALISED**	**PERMANENT**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Areas with high palaeontological sensitivity should be avoided wherever possible, and appropriate monitoring procedures must be implemented where this is not possible.* *Further, Chance Finds Protocols should be implemented and included in the EMPr to ensure that any fossils encountered during construction activities are reported and managed effectively.*	**LOW -**
CUMULATIEVE ARCHAEOLOGICAL RESOURCES	Cumulative impacts to archaeological and built environment resources, cemeteries and graves are not expected as the proposed layout has been designed to avoid sensitive areas.	**CUMULATIVE**	**LOCALISED**	**SHORT TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Pre-screening, site survey and later micro-siting of turbines and infrastructure can assist with the identification of significant heritage resources and allow for a responsive layout design and infrastructure placement such that these can be avoided wherever possible.* *Where heritage resources cannot be avoided, and/or infrastructure cannot be repositioned, appropriate mitigation*	**LOW -**

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								measures should be implemented to ensure the resources are recorded, protected and/or recovered before destruction.	
NOISE IMPACT ASSESSMENT									
DAY-TIME CONSTRUCTION OF ACCESS ROADS	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or daytime noise levels higher than 52 dBA. The proposed access roads must be constructed around 50 m from NSD07 and 70 m from NSD09. The projected noise levels could be as high as 58 Dba when construction activities take place close to the houses but this impact will be very temporary.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**UNLIKELY**	**VERY SEVERE**	**LOW -**	• *Mitigation not required due to the low significance of the impact, however best practice measures must be implemented during the construction.*	**LOW -**
NIGHT-TIME CONSTRUCTION OF ACCESS ROADS	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or night-time noise levels higher than 42 dBA. The proposed access road must be constructed around 50 m from NSD07 and 70 m from NSD09. The projected noise levels could be as high as 58 dBA when construction activities take place close to the houses but this impact will be very temporary.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**UNLIKELY**	**MODERATELY SEVERE**	**MODERATE -**	• *Significance of noise impact is medium for the scenario as conceptualized (without the implementation of mitigation measures). If the access roads must be constructed during the night-time period, these activities should be limited to areas further than 340 m from potential noise-sensitive receptors.* • *Further mitigation options are highlighted in section 11.1.1 of the Noise Impact Assessment report for the developer to consider during the future planning stages to ensure that the significance of the noise impact remain low should roads be constructed during the night-time.*	**LOW -**
DAY-TIME CONSTRUCTION TRAFFIC	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or daytime noise levels higher than 52 dBA. Construction traffic can pass around 50 m from NSD07 and 70 m from NSD09. Projected daytime noise levels would be higher than 45 dBA at these receptors. The increased noise levels would last for the duration of the construction period.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	• *Significance of noise impact is low for the scenario as conceptualized and mitigation is not required due to the low significance of the impact.*	**LOW -**
NIGHT-TIME CONSTRUCTION TRAFFIC	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or night-time noise levels higher than 42 dBA. Construction traffic can pass around 50 m from NSD07 and 70 m from NSD09. Projected night-time noise levels could be as high as 46 dBA at these receptors and could increase potential noise levels higher than 42 dBA at all receptors living closer than around 140m from the access roads. The increased noise levels would last for the duration of the construction period.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**MODERATELY SEVERE**	**LOW -**	• *Significance of noise impact is low for the scenario as conceptualized and mitigation is not required due to the low significance of the impact.*	**LOW -**
DAY-TIME	Increase in ambient sound levels that can raise the ambient sound	**DIRECT**	**LOCALISED**	**SHORT TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	• *Significance of noise impact is low for the scenario as conceptualized and mitigation is not required due to the low*	**LOW -**

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CONSTRUCTION OF WIND TURBINES	level with more than 7 dB or daytime noise levels higher than 52 dBA. The proposed wind turbines will be constructed further than 500m from the identified receptors. Projected daytime noise levels could be as high as 45 dBA for a portion of the construction period at NSDs 10 and 07. This is because of cumulative noises from various activities taking place at more than one location close to these receptors.							*significance of the activity. The activity must just be undertaken in a responsible manner.*	
NIGHT-TIME CONSTRUCTION OF WIND TURBINES	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or night-time noise levels higher than 42 dBA. The proposed wind turbines will be constructed further than 500m from the receptors. Construction activities closer than 340m from receptors will result in noise levels higher than 42 dBA and the sounds may be highly audible during quiet times (including the night-time). Due to cumulative effects (numerous equipment operating simultaneously), noise levels could be as high as 45 dBA at NSDs 10 and 07. While temporary, very high noise levels (especially when it contains impulsive noises) at night could be disturbing and could impact on the quality of sleep of the closest receptors.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**MODERATELY SEVERE**	**LOW -**	*Significance of noise impact is low for the scenario as conceptualized and mitigation is not critically required, but recommended due to the potential of a noise impact. The higher noise level is due to multiple construction activities taking place at night at more than one WTG site. To reduce this night-time noise impact, only allow night-time construction activities at one WTG site.* *Further mitigation options are highlighted in section 11.1.1 of the Noise Impact Assessment report for the developer to consider during the future planning stages to ensure that the significance of the noise impact remain low.*	**LOW -**
SOCIAL IMPACT ASSESSMENT									
EMPLOYMENT	Creation of employment, training and business opportunities during the construction phase.	**DIRECT**	**REGIONAL**	**SHORT TERM**	**PROBABLE**	**MODERATELY BENEFICIAL**	**MODERATE +**	*Where reasonable and practical the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. The focus should be on creating employment opportunities for community members from Paternoster and the St Helena Bay area. Due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area;* *Where feasible, every effort should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria;* *Before the construction phase commences the proponent should meet with representatives from the local community in Paternoster and St Helena Bay and the SBLM to establish the existence of a skills database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase;*	**MODERATE +**

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								The local authorities, relevant community representatives and local farmers should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project. *A training and skills development programme for suitably qualified local community members should be initiated prior to the initiation of the construction phase. As indicated above, the focus should be on community members from Paternoster and the St Helena Bay area;* *The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.* *The proponent should liaise with the WCDM and SBLM and local small businesses with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work;* *Where possible, the proponent should assist local BBBEE companies to complete and submit the required tender forms and associated information;* *The WCDM and SBLM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.*	
PRESENCE OF CONTRUCTION WORKERS	Potential impacts on family structures and social networks associated with the presence of construction workers An increase in alcohol and drug use; An increase in crime levels; The loss of girlfriends and/or wives to construction workers; An increase in teenage and unwanted pregnancies; An increase in prostitution; An increase in sexually transmitted diseases (STDs), including HIV.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*Where possible the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. As indicated above, the focus should be on employment community members from Paternoster and the St Helena Bay area;* *The proponent should consider the need for establishing a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from the WCDM and SBLM, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community and farm workers associated with construction workers;* *The proponent and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation;* *The proponent and contractor (s) should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase;*	**LOW -**

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								The contractor should provide transport to and from the site on a daily basis for low and semi-skilled construction workers. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site; *Where necessary, the contractors should make the necessary arrangements to enable low and semi-skilled workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks;* *It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.*	
INFLUX OF JOB SEEKERS	Potential impacts on family structures, social networks and community services associated with the influx of job seekers.	**DIRECT INDIRECT**	**LOCALISED**	**PERMANENT**	**PROBABLE**	**SLIGHT**	**LOW -**	*The proponent should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities. The focus should be in communities in Paternoster and St Helena Bay;* *The proponent should implement a training and skills development programme for local community members. The focus should be in communities in Paternoster and St Helena Bay.*	**LOW -**
SAFETY	Potential risk to safety of farmers and farm workers, livestock, damage to farm infrastructure and farming operations associated with the construction related activities and presence of workers on the site.	**INDIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase that can be linked to construction activities will be compensated for. The agreement should be signed before the construction phase commences;* *Contractors appointed by the proponent should provide daily transport for workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties;* *The proponent should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site;* *The proponent should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below);* *The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested;* *Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.* *Contractors appointed by the proponent must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation;*	**LOW -**

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								The housing of construction workers on the site should be limited to security personnel.	
FIRE RISK	Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of fires.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SEVERE**	**MODERATE -**	*The proponent should enter into an agreement with local farmers in the area whereby losses associated with fires that can be proven to be due to construction activities for the WF will be compensated for. The agreement should be signed before the construction phase commences;* *Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas;* *No smoking should be permitted on site, except in designated areas;* *Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy summer months;* *Contractor to provide adequate fire-fighting equipment on-site;* *Contractor to provide fire-fighting training to selected construction staff;* *No construction staff, with the exception of security staff, to be accommodated on site over night;* *As per the conditions of the Code of Conduct, in the event of a fire proven to be caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.*	**LOW -**
CONSTRUCTION VEHICLES	Potential safety, dust etc. and damage to road surfaces associated with movement of construction related traffic to and from the site.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*As far as possible, the transport of components to the site along the N7, R45 and R27 should be planned to avoid weekends and holiday periods, including the spring flower season (August-September);* *Movement of construction traffic should be limited to weekdays. In addition, the movement of heavy vehicles on the local roads, specifically the Paternoster Road (MR240), should not be permitted after 13h00 on Friday afternoons and before 09h00 on Monday mornings as these are times that are likely to impact on weekend visitors to Paternoster who are either travelling to or leaving Paternoster;* *The contractor should inform local farmers and representatives from the Vredenburg and Paternoster Local Authority and Tourism Sector of dates and times when abnormal loads will be undertaken;* *The contractor must ensure that damage caused by construction related traffic to local farm roads is repaired on a regular basis throughout the construction phase. The costs associated with the repair must be borne by the contractor;* *Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis , adhering to speed limits and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers;* *All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits;*	**LOW -**

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								The Contractor should ensure that workers are informed that no waste can be thrown out of the windows while being transported to and from the site. Workers who throw waste out windows should be fined; *The Contractor should be required to collect waste along the road reserve on a weekly basis;* *Waste generated during the construction phase should be transported to the local landfill site.* *EMP measures (and penalties) should be implemented to ensure farm gates are closed at all times;* *EMP measures (and penalties) should be implemented to ensure speed limits are adhered to at all times.*	
LOSS OF AGRICULTURAL LAND	The activities associated with the construction phase, such as establishment of access/haul roads, the movement of heavy vehicles, the establishment of lay-down areas and foundations for the wind turbines, substations and power lines will potentially damage topsoil and vegetation and result in damage to productive soils.	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**MODERATE -**	*The location of wind turbines, access roads, laydown areas etc. should be informed by the findings of a soil study;* *The developer should consult with affected property owners in order to enable them to factor construction activities into their rotational land use schedules;* *The location of wind turbines, access roads, laydown areas etc. should be discussed with the locally affected landowner in the finalisation process and inputs provided should be implemented in the layout as best as possible;* *The footprint areas for the establishment of individual wind turbines should be clearly demarcated prior to commencement of construction activities. All construction related activities should be confined to the demarcated area and minimised where possible;* *An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase;* *All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase. The rehabilitation plan should be informed by input from the soil scientist and discussed with the local farmer;* *The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up the Environmental Consultants appointed to undertake the EIA;* *The implementation of the Rehabilitation Programme should be monitored by the ECO;* *All workers should receive training/ briefing on the reasons for and importance of not driving in undesignated areas;* *EMP measures (and penalties) should be implemented to strictly limit all vehicle traffic to designated roads and construction areas. Under no circumstances should vehicles be allowed to drive into the veld;* *Disturbance footprints should be reduced to the minimum.* *Compensation should be paid by the developer to farmers that suffer a permanent loss of land due to the establishment of the WF. Compensation should be based on accepted land values for the area.*	**LOW -**
TRAFFIC IMPACT ASSESSMENT									
TRAFFIC FROM CONSTRUCTION VEHICLES	Gravel loss and damage to the road layer works as a result of additional truck traffic and heavy load truck traffic during the construction phase.	**INDIRECT**	**LOCALISED**	**SHORT TERM**	**DEFINITE**	**SLIGHT**	**LOW -**	*Resurfacing of sections along DR2160 if/where required and regular road maintenance along DR2160 during the construction phase.*	**LOW -**

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VISUAL IMPACT ASSESSMENT									
CLOSE PROXIMITY RESIDENTS & VISITORS - CONSTRUCTION	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed BWF.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*Ensure that vegetation is not unnecessarily removed during the construction period.* *Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) where possible.* *Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.* *Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed of regularly at licensed waste facilities.* *Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).* *Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.* *Rehabilitate all disturbed areas immediately after the completion of construction works.*	**LOW -**
OPERATIONAL PHASE									
AGRICULTURE & SOILS IMPACT ASSESSMENT									
AGRICULTURAL PRODUCTION	Impacts of the BWF on agricultural production potential for either of the two turbine layouts (i.e. the on-farm impacts).	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SEVERE**	**LOW -**	*Stabilizing of lay-down areas, water run-off lanes along roads and where contours are crossed, appropriate structures to be implemented to make sure they are still functioning well and to prevent any further activity that may be responsible for new water erosion to take place.* *Details of mitigation measures to take into consideration per turbine placing are given in Annexure 1, Tables 6.1 and 6.2 of the Agriculture & Soils Impact Assessment report.*	**LOW +**
AVIFAUNAL IMPACT ASSESSMENT									
COLLISION FATALITIES	Fatalities due to collision with operating wind turbines	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**MODERATE -**	*The minimisation of this impact is mainly achieved through the avoidance of infrastructure siting, especially turbines, in the no-go areas (refer to section 3.1 of Avifaunal Impact Assessment report), during the layout planning phase. Since turbines fall in areas with a medium level of sensitivity to birds, some mitigations measures should be implemented, as well as a monitoring plan during the operational phase - to mitigate fatality. Also, considering the bird movements observed, it is recommended that turbine minimum height of the rotor swept area is not lower than 55m and that rotor diameter does not exceed 120m.* *Aside from the measures previously listed, an operational monitoring programme is essential to determine the necessity of additional mitigation measures. In terms of additional mitigation to prevent potential fatalities due to collision, current findings do not provide sufficient evidence to implement these additional measures at this stage. However, it is highly recommended that an adaptive management approach is followed during the post-construction monitoring campaign. If any significant fatalities are observed, then it will be important to implement certain measures (designed by the avifaunal specialist), so that these impacts can be reduced.* *Mitigation measures to consider should include: habitat management, and/or turbine shut-down on demand technology, and/or the installation of deterrence systems.*	**LOW -**

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DISTURBANCE / DISPLACEMENT EFFECTS	Disturbance and/or displacement effects due to human presence during maintenance activities	**INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*In order to minimise this impact certain measures can be taken, such as avoid the presence of people and vehicles in the no-go areas as far as possible especially during the breeding season; lower the levels of noise whenever possible and avoid the destruction or disturbance of identified important features, including waterbodies and/or nests.*	**LOW -**
BAT IMPACT ASSESSMENT									
BAT FATALITIES AT OPERATIONAL WIND FARMS	The turning blades of wind turbines may result in bat fatality. This has been attributed to direct collisions with the turbine blades and barotrauma (Baerwald et al. 2008). Consequence: Potential significant declines in local bat populations of species which fly at rotor-sweep height. Currently locally abundant bat species may become locally threatened.	**DIRECT**	**NATIONAL**	**PERMANENT**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*This impact may be minimised by siting turbines away from important habitat features for bats, as well as bat roosts.* *Further impacts should be mitigated by curtailment plans (once a threshold of fatality is reached): increasing the cut-in speed for specific turbines with high bat fatality rates at specific times of night, under specific environmental conditions when fatality is greatest.*	**MODERATE -**
ECOLOGICAL IMPACT ASSESSMENT									
DISTURBANCE / DISPLACEMENT EFFECTS	The operation and presence of the facility may lead to disturbance or persecution of fauna within or adjacent to the facility.	**INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*No unauthorised persons should be allowed onto the site.* *Any potentially dangerous fauna such snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location.* *The collection, hunting or harvesting of any plants or animals at the site or in the surrounding areas should be strictly forbidden.* *If the site must be lit at night for security purposes, this should be done with low-UV type lights (such as most LEDs), which do not attract insects.* *All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.* *All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises.*	**LOW**
BROAD-SCALE ECOLOGICAL PROCESSES	Development of the wind farm may impact CBAs and broad-scale ecological processes such as the ability of fauna to disperse between strandveld patches.	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*An open space management plan should be developed for the site, which should include management of biodiversity within the affected areas, as well as that in the adjacent intact strandveld.*	**LOW -**
CUMULATIVE HABITAT LOSS	The development of the Boulders Wind Farm will potentially contribute to cumulative habitat loss and other cumulative impacts in the greater Vredenburg peninsula area.	**DIRECT CUMULATIVE**	**LOCALISED**	**LONG TERM**	**POSSIBLE**	**SLIGHT**	**LOW -**	*Avoid any further habitat loss and degradation of any intact vegetation fragments.* *Promote sustainable land use practices in the area and especially on wind farm properties to improve the quality of the habitat for fauna and flora. Reducing grazing pressure on intact remnants is identified as a particularly important mitigation measure to improve habitat quality.* *Ensure that alien species of flora as well as fauna are managed to ensure that they do not have a broadly negative impact.*	**LOW -**
ECONOMIC IMPACT ASSESSMENT									
GDP-R	Contribution to the growth of the local and provincial economies for	**DIRECT INDIRECT**	**REGIONAL**	**LONG TERM**	**DEFINITE**	**SLIGHTLY BENEFICIAL**	**MODERATE +**	*Undertake an audit of local SMMEs that could be used to provide selected services and goods during operation (i.e.*	**MODERATE +**

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	the duration of the Boulders Wind Farm operation phase.							*security, transportation, land clearance and road maintenance, etc.)* - *Contract local SMMEs for on-site related non-technical activities*	
EMPLOYMENT	Creation of sustainable employment opportunities during operations.	**DIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**SLIGHTLY BENEFICIAL**	**MODERATE +**	- *Employ from the local labour pool as far as feasible* - *Identify potential candidates from the local labour pool during construction and train them in time for the start of operation*	**MODERATE +**
HOUSEHOLD INCOME	Improved household income and living standards during operation.	**DIRECT INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHTLY BENEFICIAL**	**MODERATE +**	- *Employ from the local labour pool as far as feasible*	**MODERATE +**
FRESHWATER IMPACT ASSESSMENT									
None identified by specialist									
HERITAGE, ARCHAEOLOGY & PALAEONTOLOGY IMPACT ASSESSMENT									
VISUAL IMPACTS ON HERITAGE RESOURCES	Visual impact on scenic qualities of the Vredenburg-Stompneus Bay Road, the Paternoster-Stompneus Bay Road and the built environment heritage of Rooiheuwel and Boebesakskraal farmsteads.	**INDIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**VERY SEVERE**	**VERY HIGH -**	- *Maintain the general appearance of the facility as a whole.*	**MODERATE -**
NOISE IMPACT ASSESSMENT									
DAY-TIME OPERATION OF WIND TURBINES	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or daytime noise levels higher than 52 dBA. The proposed wind turbines are located further than 500m from the structures identified as possible houses, but cumulative effects due to numerous wind turbines operating within 1,000m these dwellings would increase noise levels. Ambient sound level measurements highlighted average daytime sound levels of more than 50 dBA.	**DIRECT**	**LOCALISED**	**LONG TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	- *Significance of noise impact is low for the scenario as conceptualized.*	**LOW -**
NIGHT-TIME OPERATION OF WIND TURBINES	Increase in ambient sound levels that can raise the ambient sound level with more than 7 dB or night-time noise levels higher than 42 dBA. The proposed wind turbines are located further than 500m from the receptors, but cumulative effects due to numerous wind turbines operating simultaneously within 2,000m from a receptor would increase noise levels. Without mitigation: In the unmitigated scenario, noise rating levels could be as high as 45 dBA at NSDs 07 (45 dBA), 08 (44.4 dBA), 09 (44.4 dBA) and 10 (44.6 dBA). This is a cumulative effect due to multiple WTG operating within 2,000m from these receptors. The	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	- *Significance of noise impact is medium for an unmitigated scenario as conceptualized. It is not recommended that the structures located within the 45 dBA noise rating level contour be used for residential use.* - *Mitigation is available and highlighted in section 11.2.1 of the Noise Impact Assessment Report, with the relocation of WEC 16 recommended (further than 800m from these NSD).*	**LOW -**

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	change in ambient sound levels may be higher than 7 dB between wind speeds of 5 and 7 m/s. Ambient sound level measurements highlighted average night-time sound levels of more than 45 dBA. With mitigation: Projected noise rating levels will be less than 45 dBA at all receptors.								
SOCIAL IMPACT ASSESSMENT									
CLEAN ENERGY	Development of infrastructure to generate clean, renewable energy.	**DIRECT**	**LOCALISED REGIONAL NATIONAL**	**LONG TERM**	**DEFINITE**	**VERY BENEFICIAL**	**HIGH +**	*Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. As indicated above, the focus should be in community members from Paternoster and St Helena Bay;* *Maximise opportunities for local content, procurement and community shareholding;* *Establish a visitor centre. As indicated in the literature review, visitor centers in Scotland have attracted large numbers of visitors to wind farms.*	**HIGH +**
EMPLOYMENT	Creation of employment and business opportunities associated with the operation phase.	**DIRECT INDIRECT**	**LOCALISED REGIONAL NATIONAL**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**MODERATE +**	*The proponent should implement a training and skills development programme for locals during the first 5 years of the operation phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operation phase of the project. The focus should be on community members from Paternoster and St Helena Bay;* *The proponent, in consultation with the WCDM and SBLM, should investigate the options for the establishment of a Community Development Trust.*	**MODERATE +**
INCOME FOR LANDOWNERS	The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for products and farming inputs, such as feed etc.	**DIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**SLIGHT**	**MODERATE +**	*The relevant lease agreements between the proponent and the land owners must be put in place and signed off prior to commencement.*	**MODERATE +**
SOCIO-ECONOMIC BENEFITS: LOCAL COMMUNITY	SED initiatives funded by revenue generated from the sale of energy. The revenue can be used to fund local community development. Creation of jobs; Education; Support for and provision of basic services; School feeding schemes; Training and skills development; Support for SMME's.	**DIRECT**	**LOCALISED REGIONAL**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW +**	*The focus of the SED initiatives, including the Community Trust, should be on supporting initiatives in Paternoster and the St Helena Bay area;* *The WCDM, SBLM and registered local community organisations with a proven track record should be consulted as to the structure and identification of potential projects to be supported by the SED initiatives. The key departments in the WCDM and SBLM that should be consulted include the Municipal Managers Office, IDP Manager and LED Manager;* *Clear criteria for identifying and funding SED projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community;* *Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the Community Trust from the WF.*	**MODERATE +**

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VISUAL IMPACT ON SENSE OF PLACE: HIA AND VIA	Visual impact associated with the proposed WF and the potential impact on the areas rural sense of place and character	**DIRECT**	**REGIONAL**	**LONG TERM**	**DEFINITE**	**SEVERE**	**HIGH -**	*The recommendations contained in the VIA and the HIA (preferred alternative) should be implemented, specifically the removal or relocation of all the wind turbines located to the west of the Vredenburg to Stompneus Bay Road. In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**HIGH -**
VISUAL IMPACT ON SENSE OF PLACE: INTERVIEWS	Visual impact associated with the proposed WF and the potential impact on the areas rural sense of place and character	**DIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**SLIGHT**	**LOW -**	*The recommendations contained in the VIA and the HIA (preferred alternative) should be implemented, specifically the removal or relocation of all the wind turbines located to the west of the Vredenburg to Stompneus Bay Road. In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**LOW -**
PROPERTY VALUES	Potential impact on general property values in the area due to visual impact associated with the proposed WF.	**INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*The recommendations contained in the VIA and the HIA (preferred alternative) should be implemented, specifically the removal or relocation of all the wind turbines located to the west of the Vredenburg to Stompneus Bay Road. In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.*	**LOW -**
TOURISM	Potential impact of the wind energy facility on local tourism. Hindrance to tourism.	**DIRECT INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*The recommendations contained in the VIA and the HIA (preferred alternative) should be implemented, specifically the removal or relocation of all the wind turbines located to the west of the Vredenburg to Stompneus Bay Road. In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.* *The proponent should consider the establishment of a visitor centre should the BWF be approved.*	**LOW -**
TOURISM	Potential impact of the wind energy facility on local tourism. Tourism attraction.	**DIRECT INDIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**SLIGHT**	**LOW +**	*The recommendations contained in the VIA and the HIA (preferred alternative) should be implemented, specifically the removal or relocation of all the wind turbines located to the west of the Vredenburg to Stompneus Bay Road. In response to this mitigation recommendation the developer has relocated 7 of the 13 turbines.* *The proponent should consider the establishment of a visitor centre should the BWF be approved.*	**LOW +**
TRAFFIC IMPACT ASSESSMENT									
TRAFFIC FROM MAINTENANCE VEHICLES	Gravel loss along DR2160.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Routine road maintenance by the relevant Roads Authority.*	**LOW -**
VISUAL IMPACT ASSESSMENT									
RESIDENTS & VISITORS	Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity (i.e. within 5km) to the wind turbine structures	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*Maintain the general appearance of the facility as a whole.*	**HIGH -**
ROAD USERS	Visual impact on observers travelling along the roads in close proximity (i.e. within 5km) to the wind turbine structures.	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*Maintain the general appearance of the facility as a whole.*	**HIGH -**
MODERATE PROXIMITY RESIDENTS & VISITORS	Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity (i.e. within 5km – 10km) to the wind turbine structures.	**DIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**HIGH -**	*Maintain the general appearance of the facility as a whole.*	**HIGH -**
SHADOW FLICKER	Visual impact of shadow flicker on sensitive visual receptors in close proximity to the proposed BWF.	**DIRECT**	**LOCALISED**	**LONG TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Not Applicable due to the low probability of occurrence*	**LOW -**

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LIGHTING - OPERATIONAL	Visual impact of lighting at night on visual receptors in close to medium proximity to the proposed BWF.	**DIRECT**	**LOCALISED / REGIONAL**	**LONG TERM**	**DEFINITE**	**SEVERE**	**HIGH -**	*Limit aircraft warning lights to the turbines on the perimeter according to CAA requirements, thereby reducing the overall impact.* *Investigate aircraft warning lights that only activate when the presence of an aircraft is detected.* *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.*	**MODERATE -**
ANCILLARY INFRASTRUCTURE	Visual impact of the ancillary infrastructure on observers in close proximity to the structures.	**DIRECT**	**LOCALISED**	**LONG TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Maintain the general appearance of the facility as a whole.*	**LOW -**
SENSE OF PLACE	The potential impact on the sense of place of the region.	**INDIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*Maintain the general appearance of the facility as a whole.*	**MODERATE -**
DECOMMISSIONING PHASE									
AGRICULTURE & SOILS IMPACT ASSESSMENT									
None identified by specialist									
AVIFAUNAL IMPACT ASSESSMENT									
DISTURBANCE / DISPLACEMENT EFFECTS	Disturbance and/or displacement effects due to decommissioning works, noise, human presence and machinery movements	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*In order to minimise this impact certain measures can be taken, such as avoiding the presence of people and vehicles in the no-go areas as far as possible; whenever possible schedule activities in order to avoid disturbance during the breeding season if any confirmed nests are identified within the study area – the breeding season interruption must be adjusted to the species ecology; lower the levels of noise whenever possible and avoid the destruction or disturbance of identified important features, including waterbodies and/or nests.* *In terms of the Secretarybird nest, 500m around this nest must be considered as a NO-GO area for wind turbine placement. A 2000m buffer should also be considered as a medium sensitive zone around this nest. This requires monitoring (by an ECO) during the decommissioning period (within the buffered area) to identify whether or not the nest is in fact still is use. If confirmed to be in use, then risk situations should be identified that would warrant the reduction of construction operations within the buffered area, temporarily.*	**LOW -**
BAT IMPACT ASSESSMENT									
None identified by specialist									
ECOLOGICAL IMPACT ASSESSMENT									
None identified by specialist									
ECONOMIC IMPACT ASSESSMENT									
GDP-R	Increased production due to decommissioning activities and recovery of valuable resources through recycling.	**DIRECT INDIRECT**	**REGIONAL**	**SHORT TERM**	**PROBABLE**	**SLIGHTLY BENEFICIAL**	**LOW +**	*Develop and implement a material recovery strategy to optimise the use of valuable metallic materials comprising various components of the wind farm* *Procure services from local construction business*	**MODERATE +**
FRESHWATER IMPACT ASSESSMENT									
None identified by specialist									
HERITAGE, ARCHAEOLOGY & PALAEONTOLOGY IMPACT ASSESSMENT									

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VISUAL IMPACTS ON HERITAGE RESOURCES	Visual impact on scenic qualities of the Vredenburg-Stompneus Bay Road, the Paternoster-Stompneus Bay Road and the built environment heritage of Rooiheuwel and Boebesakskraal farmsteads.	**INDIRECT**	**LOCALISED**	**LONG TERM**	**DEFINITE**	**VERY SEVERE**	**VERY HIGH -**	*Remove infrastructure not required for the post-decommissioning use of the servitude.* *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**MODERATE -**
NOISE IMPACT ASSESSMENT									
None identified by specialist									
SOCIAL IMPACT ASSESSMENT									
None identified by specialist									
TRAFFIC IMPACT ASSESSMENT									
TRAFFIC FROM DECOMMISSIONING VEHICLES	Gravel loss and damage to the road layer works as a result of additional truck traffic and heavy load truck traffic during the decommissioning phase.	**DIRECT**	**LOCALISED**	**SHORT TERM**	**PROBABLE**	**SLIGHT**	**LOW -**	*Resurfacing of sections along DR2160 if/where required once the decommissioning has been completed.*	**LOW -**
VISUAL IMPACT ASSESSMENT									
RESIDENTS & VISITORS	Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity (i.e. within 5km) to the wind turbine structures	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*Remove infrastructure not required for the post-decommissioning use.* *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**LOW -**
ROAD USERS	Visual impact on observers travelling along the roads in close proximity (i.e. within 5km) to the wind turbine structures.	**DIRECT**	**LOCALISED**	**LONG TERM**	**PROBABLE**	**VERY SEVERE**	**HIGH -**	*Remove infrastructure not required for the post-decommissioning use.* *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**LOW -**
MODERATE PROXIMITY RESIDENTS & VISITORS	Visual impact on observers (residents at homesteads and visitors/tourists) in close proximity (i.e. within 5km – 10km) to the wind turbine structures.	**DIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**HIGH -**	*Remove infrastructure not required for the post-decommissioning use.* *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**LOW -**
ANCILLARY INFRASTRUCTURE	Visual impact of the ancillary infrastructure on observers in close proximity to the structures.	**DIRECT**	**LOCALISED**	**LONG TERM**	**UNLIKELY**	**SLIGHT**	**LOW -**	*Remove infrastructure not required for the post-decommissioning use.* *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**LOW -**
SENSE OF PLACE	The potential impact on the sense of place of the region.	**INDIRECT**	**REGIONAL**	**LONG TERM**	**PROBABLE**	**MODERATELY SEVERE**	**MODERATE -**	*Remove infrastructure not required for the post-decommissioning use.* *Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.*	**LOW -**