

## H2 – SPECIALIST IMPACTS

### PLANNING AND DESIGN PHASE

ISSUE	DESCRIPTION OF IMPACT	NATUR E E F F E C T	SPATIA L	TEMPO R A L	CERTAI N T Y	SEVERI T Y	REVER S I B I L I T Y	IRREPL A C E A B L E	MITIGA T I O N	SIGNIFICANCE P R E- M I T I G A T I O N	MITIGATION MEASURES	SIGNIFICANCE P O S T- M I T I G A T I O N
<b>AGRICULTURAL IMPACT ASSESSMENT</b>												
No impacts specified												
<b>TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT</b>												
No impacts specified												
<b>AQUATIC IMPACT ASSESSMENT</b>												
No impacts specified	Although no impacts are specified in the AIA with respect to planning and design, various mitigation measures have been recommended that are applicable to the Planning and Design Phase.	NA	NA	NA	NA	NA	NA	NA	NA	NA	<p><b>River and Wetland Buffer Zones</b></p> <ul style="list-style-type: none"> <li>⤴ A 50m buffer zone around all watercourses is recommended.</li> <li>⤴ All highly sensitive landscapes characterised by soil piping and sink hole formation must be avoided as shown in Figure 50 of the AIA.</li> </ul> <p><b>No-Go Areas for Turbine and Laydown Sites</b></p> <p>All turbines and laydown areas must be located outside of the following features as shown in Figure 50:</p> <ul style="list-style-type: none"> <li>⤴ All mapped watercourses.</li> <li>⤴ 50m buffer zone to all watercourses.</li> </ul> <p><b>Internal Access and Haulage Road Alignment Measures</b></p> <p>The following best practice planning and design measures should be investigated for inclusion into the internal road alignment and design:</p> <ul style="list-style-type: none"> <li>⤴ All service roads should follow the existing road network as far as practically possible.</li> <li>⤴ Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 50m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible. This excludes where crossings are required.</li> <li>⤴ Where new wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following:               <ul style="list-style-type: none"> <li>○ For all crossing types and designs, flow through road crossings should not be unnecessarily concentrated (or impeded) and flow velocity should not be increased. In this regard, wetland and stream / river crossings should be via box / portal culverts established across the entire width of the wetland or riparian zone to avoid flow narrowing and concentration. Open bottom box culverts should be used and they should be sized to transport not only water, but the other materials that might be mobilized (i.e. debris). Pipe culverts should be avoided.</li> <li>○ Erosion protection and energy dissipation measures should be established at all road crossing outlets e.g. stilling basins and reno-mattresses.</li> <li>○ All culvert inlets and outlets and associated outlet erosion protection structures must not be raised above the wetland/riparian surface and/or stream/river bed and must be established to reflect the natural downstream slope of the wetland / riparian surface and/or stream / river bed.</li> <li>○ Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing informal road crossings or cattle crossing routes.</li> <li>○ The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings are straight and do not involve using long curves and are aligned at right angles to flow.</li> <li>○ If any road fill is utilised at wetland crossings, a porous layer should be established within the road fill at the appropriate elevation to ensure that wetland interflow and overland flow is able to pass through the road fill.</li> </ul> </li> <li>⤴ For existing watercourse crossings, every effort should be made to minimize the impacts by considering the following:</li> </ul>	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE	SPATIAL	TEMPORAL	CERTAIN	SEVERITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
											<ul style="list-style-type: none"> <li>○ Undersized or under-designed pipe culverts must be replaced with sufficiently sized box or pipe culverts.</li> <li>○ Erosion protection and energy dissipation measures should be established at all road crossing outlets e.g. stilling basins and reno-mattresses.</li> <li>○ Every effort must be made to minimise the upgraded footprint of the existing roads at watercourse crossings.</li> </ul> <ul style="list-style-type: none"> <li>▲ The internal road realignments recommended in the AIA should be incorporated into internal road designs, as described in Table 30 of the AIA. Summary of details of recommended road re-alignments.</li> </ul> <p><b>Service Road Stormwater Management</b></p> <p>The following road stormwater management measures are recommended:</p> <ul style="list-style-type: none"> <li>▲ Stormwater generated by the upgraded and new roads should be discharged at regular intervals and many small outlets should be favoured over few large.</li> <li>▲ Stormwater outlets must not be established within wetlands or riparian zones.</li> <li>▲ As far as practically possible, stormwater conveyance should be via open drains rather than pipes and conveyance from the road drains to the outlets should via open drains with vegetated or rough surfaces that are armoured with erosion protection.</li> <li>▲ All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy for gravel roads will need to be installed at appropriate locations.</li> <li>▲ All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.</li> </ul>	
<b>AVIFAUNAL IMPACT ASSESSMENT</b>												
No impacts specified												
<b>BAT IMPACT ASSESSMENT</b>												
No impacts specified												
<b>HERITAGE IMPACT ASSESSMENT</b>												
<b>IMPACTS ON HERITAGE REOURCES</b>	The planned layout and siting of construction activities and infrastructure could affect known heritage sites such as: <ul style="list-style-type: none"> <li>▲ Preferred Buildings</li> <li>▲ Grave sites</li> <li>▲ Non-colonial stone walled features</li> </ul>	DIRECT	LOCALISED	PERMANENT	POSSIBLE	SLIGHT	IRREVERSIBLE	RESOURCE WILL BE LOST	EASY	<b>LOW (-)</b>	The following mitigation measures are recommended by the HIA. <ul style="list-style-type: none"> <li>▲ A servitude of at least 50m should be maintained around all identified heritage sites wherever possible.</li> </ul>	<b>LOW (-)</b>
<b>PALAEONTOLOGICAL IMPACT ASSESSMENT</b>												
No impacts specified												
<b>NOISE IMPACT ASSESSMENT</b>												
No impacts specified												
<b>SOCIO-ECONOMIC IMPACT ASSESSMENT</b>												
No impacts specified												
<b>VISUAL IMPACT ASSESSMENT</b>												
No impacts specified												
<b>TRAFFIC IMPACT ASSESSMENT</b>												
No impacts specified												



# CONSTRUCTION PHASE

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	RESOURCE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>AGRICULTURAL IMPACT ASSESSMENT</b>												
INDIRECT AND BIOLOGICAL IMPACTS	<p><b>Direct impacts</b></p> <p>A possible environmental impact of the development is the creation of dust along the main roads by large trucks and construction vehicles. Dust could have an impact on the livestock carrying capacity of adjoining properties.</p>	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<p>Biological impacts</p> <ul style="list-style-type: none"> <li>Keep the construction period as short as possible; and</li> <li>Employ dust reduction practices.</li> </ul>	LOW (-)
	<p><b>Indirect impacts</b></p> <p>During construction of the WEF, the following indirect impacts and agriculture are possible:</p> <ul style="list-style-type: none"> <li>Increase in stock theft and poaching;</li> <li>Restricted access by farmers to own farms and farming infrastructure; and</li> <li>Blasting with explosives can endanger animals and endanger farm workers.</li> </ul>	INDIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT		RESOURCE WILL BE LOST	EASY	LOW (-)	<p>Indirect impacts of development</p> <ul style="list-style-type: none"> <li>No unauthorised individuals should be allowed to access the site without permission from the landowners and/or the developers. Theft and vandalism can be reduced by providing additional security to farmers where necessary;</li> <li>The construction period is for a short period. Discuss the possible restriction of access to farm housing or farming infrastructure like watering facilities, boreholes, etc. with the farmers and come up with solutions;</li> <li>Maintenance workers must not handle or remove any livestock or wildlife from the site or the surrounding properties; and</li> <li>Police should be notified if any illegal actions take place.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT		RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<p><b>No-go alternative</b></p> <p>No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACT							NA	<ul style="list-style-type: none"> <li>NA</li> </ul>	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY / REVERSIBILITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT</b>												
LOSS OF LOW ESCARPMENT MOIST GRASSLAND (LC)	<p><b>Direct impacts</b></p> <p>The clearing of approximately 56 ha of vegetation for the construction of MNWP will result in the direct loss of Low Escarpment Moist Grassland (LC). Approximately 90% of the historical extent (1742.3 ha) of this vegetation type remains (SANBI, 2021). It should be noted that approximately 1790 ha of this vegetation type remains within MNWP. Approximately 460 ha has been altered due to the presence of Black Wattle stands and other land uses (See Section 3.3.2).</p>	DIRECT	LOCALISED	PERMANENT	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ The clearance of approximately 56 ha of vegetation must be strictly limited to that which is necessary for the construction of turbine hard stands, roads, pylons, and other project related infrastructure.</li> <li>▶ Laydown areas and substations should where possible be located within previously disturbed areas, such as previously cultivated lands or areas impacted by Black Wattle.</li> <li>▶ Any impacted areas outside of the development footprint must be rehabilitated using indigenous plant species commonly occurring within Low Escarpment Moist Grassland in line with an approved Rehabilitation Management Plan.</li> <li>▶ Permits for the removal of plant species protected in terms of the Natal Nature Conservation Ordinance (No. 15 of 1974) must be obtained prior to vegetation clearance.</li> <li>▶ The footprint of turbine hardstands, pylons, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations otherwise a permit must be obtained to remove any plant SCC.</li> </ul>	Low (-)
	<p><b>Cumulative impacts</b></p> <p>Approximately 460 ha of Low Escarpment Moist Grassland (LC) has been altered within MNWP due to alien invasive plantations, amongst other anthropogenic activities. The additional loss of 56 ha vegetation associated with the construction of MNWP will therefore have a moderate cumulative impact.</p>	CUMULATIVE	STUDY AREA	PERMANENT	DEFINITE	MODERATE	IRREVERSIBLE	RESOURCE WILL BE LOST	N/A	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ Where practical and feasible, place turbines and associated infrastructure in areas that are already disturbed to minimise cumulative loss of natural ecosystems and therefore important water source and biodiversity areas.</li> <li>▶ Further mitigation could involve eradicating alien invasive species from the properties, however, it is difficult to implement mitigation measures as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, this could be negotiated with the landowner.</li> </ul>	N/A
	<p><b>No-go alternative</b></p> <p>If MNWP does not go ahead, the current impacts associated with the infestation of invasive alien species will continue. As such, the No-go Alternative is classified as low negative.</p>	NO-GO	STUDY AREA	LONG-TERM	DEFINITE	SLIGHT	IRREVERSIBLE	RESOURCE HAS BEEN LOST	N/A	LOW (-)	<ul style="list-style-type: none"> <li>▶ N/A</li> </ul>	N/A
LOSS OF KWAZULU-NATAL HIGHLAND THORNVELD (LC)	<p><b>Direct impacts</b></p> <p>The clearing of approximately 3 ha of vegetation for the construction of MNWP WEF will result in the direct loss of KwaZulu-Natal Highland Thornveld (LC). Approximately 63% of the historical extent (5227.5 ha) of this vegetation type remains (SANBI, 2021). It should be noted that approximately 510 ha of this vegetation type remains within MNWP. Approximately 150 ha of vegetation has been altered due to the presence of Black Wattle stands, fallow lands, and existing roads/paths (see Section 3.3.2).</p>	DIRECT	LOCALISED	PERMANENT	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ As above.</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF EFFECT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> Approximately 150 ha of KwaZulu-Natal Highland Thornveld has been lost within MNWP WEF due to alien invasive plantations, and fallow lands. The additional loss of 3 ha vegetation associated with the construction of MNWP 2 will therefore have a moderate cumulative impact.</p>	CUMULATIVE	LOCALISED	PERMANENT	DEFINITE	MODERATE	IRREVERSIBLE	RESOURCE WILL BE LOST	N/A	LOW (-)	<ul style="list-style-type: none"> <li>The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A
	<p><b>No-go alternative</b> If MNWP does not go ahead, the current impacts associated with the infestation of invasive alien species will continue. As such, the No-go Alternative is classified as low negative.</p>	NO-GO	STUDY AREA	LONG-TERM	DEFINITE	SLIGHT	IRREVERSIBLE	RESOURCE HAS BEEN LOST	N/A	LOW (-)	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A
<b>LOSS OF SOUTHERN MISTBELT FOREST (LC)</b>	<p><b>Direct impacts</b> The patches of isolated native forest within MnWP WEF have been delineated and declared no-go areas. These patches of forest provide several ecosystem services and important habitat for several plant and animal SCC. Moreover, all natural forest patches are protected in terms of the National Forest Act of 1998. Should construction activities encroach on these delineated areas, the impact associated with the loss of forest habitat would be high. However, if the recommended mitigation measures and buffers are implemented, the impact on these areas would be low.</p>	DIRECT	LOCALISED	PERMANENT	POSSIBLE	SEVERE	IRREVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>All forest patches have been delineated and declared no-go areas.</li> <li>A minimum of a 50 m no-go buffer must be established around all forest patches.</li> <li>Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.</li> </ul>	N/A
	<p><b>Cumulative impacts</b> Alien invasive plantations have already replaced indigenous forest within certain areas of MNWP. However, there will be no additional loss of forest associated with the construction of MNWP of the proposed Newcastle WEF as they have been delineated as no-go areas.</p>	CUMULATIVE	STUDY AREA	PERMANENT	DEFINITE	HIGH	IRREVERSIBLE	RESOURCE WILL BE LOST	N/A	N/A	<ul style="list-style-type: none"> <li>All forest patches have been delineated and declared no-go areas. Therefore, there is no cumulative impact associated with the proposed development.</li> </ul>	N/A
	<p><b>No-go alternative</b> If MNWP does not go ahead, the current impacts associated with the infestation of invasive alien species will continue. As such, the No-go Alternative is classified as low negative.</p>	NO-GO	STUDY AREA	LONG-TERM	DEFINITE	SLIGHT	IRREVERSIBLE	RESOURCE HAS BEEN LOST	N/A	LOW (-)	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A
<b>LOSS OF PLANT SCC</b>	<p><b>Direct impacts</b> The clearance of vegetation could result in the loss of plant SCC, particularly species that are protected in terms of the PNCO. It is therefore recommended that the footprint of turbine hardstands, pylons, roads, and other project related infrastructure is micro-sited prior to construction. Should any populations of threatened SCC be identified, the design and placement of project components should be amended to avoid these populations. Provided the recommended mitigation measures are implemented, this impact can be reduced to low negative.</p>	DIRECT	LOCALISED	PERMANENT	POSSIBLE	MODERATE	IRREVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>The footprint of turbine hardstands, pylons, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC (CR and EN) be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations.</li> <li>Permits for the removal of plant species protected in terms of the Natal Nature Conservation Ordinance (No. 15 of 1974) must be obtained prior to vegetation clearance.</li> <li>Construction vehicles and machinery must not encroach into</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b>            SCC have likely already been lost because of the existing activities and developments in the broader area. As such, the loss of SCC associated with MNWP will likely contribute to the cumulative loss of SCC within the region. However, if the mitigation measures as described in this report are implemented and adhered to, this impact can be reduced to low negative.</p>	DIRECT	LOCALISED	PERMANENT	POSSIBLE	MODERATE	IRREVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	identified 'no-go' areas or areas outside the development footprint.	LOW (-)
	<p><b>No-go alternative</b>            The No-go alternative will not require the clearance of vegetation and will therefore not result in the loss of plant SCC. The no-go alternative is therefore negligible.</p>	NO-GO	NO IMPACT							NA	NA	NA



ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>DISTURBANCE AND/OR DEATH OF HERPETOFAUNA AND/OR LOSS OF HABITATS</b>	<p><b>Direct impacts</b></p> <p>During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil, and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of herpetofauna via increased noise or air pollution. Additionally, the loss of vegetation/soil due to clearance will result in the direct loss of faunal habitat, which will directly, and indirectly, impact on amphibians and reptiles adapted to their ground dwelling habitats. Reptiles also face a high risk of being poached in the wild, and the increase in individuals associated with the construction of the proposed development could create reptile poaching opportunities. As such, this impact is rated moderate negative.</p>	DIRECT	STUDY AREA	SHORT-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ It is illegal to remove or kill amphibians and reptiles within the study area listed as either Schedule I or II on the PNCO unless the relevant permit is acquired.</li> <li>▶ All construction staff must be educated with regards to wildlife conservation, and all staff employed by the developer must ensure that any amphibians or reptiles encountered during construction of the proposed development are not harmed or killed.</li> <li>▶ Amphibians and reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment areas while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibian or reptile species may be removed off site without proper authorisation from the relevant authority.</li> <li>▶ A rescue plan must be developed and implemented by the applicant to protect reptiles which could fall into construction pits.</li> <li>▶ The appointed ECO should be trained in snake handling and removal techniques.</li> <li>▶ Any amphibian or reptile species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.</li> <li>▶ All individuals, including construction workers must sign a register prior to accessing the construction site.</li> <li>▶ Construction workers must not be housed on site.</li> <li>▶ Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.</li> <li>▶ The construction of turbine hardstands in waterbodies and on the identified rocky outcrops (identified as no-go areas) must be avoided. Moreover, some amphibian species breed in temporary waterbodies, therefore it is recommended that construction activities do not take place in wet or overly saturated areas until they have become suitably dried.</li> <li>▶ All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>The proposed development will likely exacerbate current impacts (e.g., roads, farms, plantations, and houses) on amphibians and reptiles within the study area and may exacerbate the loss of protected reptile species through increased poaching opportunities. Moreover, amphibians and reptiles are relatively poor dispersers and are slower to move away from construction areas, increasing their risk to impacts. Therefore, the cumulative impact is rated moderate negative.</p>	DIRECT	STUDY AREA	SHORT-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A



ISSUE	DESCRIPTION OF IMPACT	NATURE OF SPATIAL	TEMPORAL	CERTAINTY	SEVERITY / REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION		
											TEMPORAL	CERTAINTY
	<p><b>No-go alternative</b></p> <p>The No-go alternative will not require construction activities associated with the proposed development to take place and therefore will not result in any additional disturbance and/or death to amphibian or reptile species. The no-go alternative therefore is negligible.</p>	NO-GO	NO IMPACT					NA	NA	NA		
DISTURBANCE AND/OR DEATH OF MAMMALS AND/OR LOSS OF HABITATS	<p><b>Direct impacts</b></p> <p>Construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in wildlife mortalities through road kills or accidental killing, and/or cause the displacement of mammals via increased noise or air pollution. Additionally, the loss of vegetation/soil due to clearance will result in the direct loss of faunal habitat, which will directly, and indirectly, impact on small sedentary species adapted to their ground dwelling habitats. Larger more agile species such as antelope are likely to disperse to more suitable habitats away from construction areas. As such, this impact is rated slight negative.</p>	DIRECT	STUDY AREA	SHORT-TERM	MAY OCCUR	LOW	REVERSIBLE	RESOURCES WILL PARTLY BE LOST	ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>It is illegal to remove or kill mammals within the study area listed as either Schedule I or II on the PNCO unless the relevant permit is acquired.</li> <li>All construction staff must be educated with regards to wildlife conservation, and all staff employed by the developer must ensure that any mammals encountered during construction of the proposed development are not harmed or killed.</li> <li>Any mammals encountered must be allowed to move away from the construction area. No mammal may be removed off site without proper authorisation from the relevant authority.</li> <li>Any mammal species that may die due to construction activities associated with the proposed development must be recorded (e.g., photographed and GPS coordinates taken) and reported to the appointed ECO and relevant authorities (i.e., EWT). Where needed, the carcass should be donated to SANBI.</li> <li>Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.</li> <li>The construction of turbine hardstands in waterbodies and on the identified rocky outcrops (identified as no-go areas) must be avoided.</li> <li>All reasonable and feasible measures should be implemented to reduce noise in ecologically sensitive areas.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>The addition of the proposed development may exacerbate current impacts on mammals within the study area due to existing developments (e.g., roads, farms, plantations, and houses), and could exacerbate the loss of protected mammal species through increased poaching opportunities. However, mammals are relatively agile and can move away from construction areas to more suitable habitat. Therefore, the cumulative impact is rated slight negative.</p>	DIRECT	STUDY AREA	SHORT-TERM	MAY OCCUR	LOW	REVERSIBLE	RESOURCES WILL PARTLY BE LOST	ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A
	<p><b>No-go alternative</b></p> <p>The no-go alternative will not require construction activities associated with the proposed development to take place and therefore will not result in any additional disturbance and/or death to mammal species. The no-go alternative therefore is negligible.</p>	NO-GO	NO IMPACT					NA	NA	NA		

ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>DISTURBANCE AND/OR LOSS OF HERPETOFAUNA SCC</b>	<p><b>Direct impacts</b> Construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in the loss of herpetofauna SCC through increased road kills or accidental killing, and/or cause the displacement of herpetofauna SCC via increased noise or air pollution. Two herpetofauna SCC have been identified in this report, namely the Spotted Shovel-nosed Frog, which is restricted to MNWP of the proposed development, and the Striped Harlequin Snake. Neither have been recorded nor observed within study area, but the Striped Harlequin Snake is expected to have a high chance of occurrence within the study area (refer to Section 3.4.1). The Spotted Shovel-nosed frog on the other hand is expected to have a low chance of occurrence within the study area, and the current development footprint does not extend into its current range. As such, this impact is rated as slight negative.</p>	DIRECT	LOCALISED	PERMANENT	MAY OCCUR	LOW	REVERSIBLE	RESOURCES WILL PARTLY BE LOST	ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>▶ A Search and Rescue Operation should be undertaken or commissioned by the applicant for protected amphibian and reptile species.</li> <li>▶ It is illegal to remove or kill any of the amphibians and reptiles within the study area that are listed as either Schedule I or II on the PNCO. Not all areas can be avoided, but it is recommended that construction staff are educated with regards to wildlife conservation and that all staff employed by the developer ensure that any amphibians or reptiles encountered are not harmed or killed.</li> <li>▶ Amphibians or reptiles encountered must be allowed to move away from the construction area. In the event they need to be translocated, amphibians must be released in the same catchment area while reptiles must be relocated to directly adjacent areas of the proposed development. No amphibians or reptiles may be removed off site without proper authorisation from the relevant authority.</li> <li>▶ Where possible, amphibian or reptile SCC observed on site must be recorded (photographed, GPS coordinates taken) and loaded onto iNaturalist by the appointed ECO.</li> <li>▶ The construction of turbine hardstands on permanent waterbodies must be avoided.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Herpetofauna SCC likely have been disturbed and/or lost due to existing developments and activities within the study area, and the potential loss of herpetofauna SCC associated with the construction of the proposed development may contribute to the overall cumulative loss of SCC within the broader study area. As such, this impact is rated as slight negative.</p>	CUMULATIVE	STUDY AREA	PERMANENT	MAY OCCUR	LOW	REVERSIBLE	RESOURCES WILL PARTLY BE LOST	ACHIEVABLE	LOW (-)		LOW (-)
	<p><b>No-go alternative</b> The no-go alternative will not require the clearance of vegetation/soil and therefore will not result in the potential loss of herpetofauna SCC. The no-go alternative therefore is negligible.</p>	NO-GO	NO IMPACT							NA	▶ NA	NA
<b>DISTURBANCE AND/OR LOSS OF MAMMAL SCC</b>	<p><b>Direct impacts</b> During the construction phase, construction activities associated with the proposed development (e.g., vegetation clearance, excavation of soil and the movement of construction vehicles) could result in the disturbance and/or loss of mammal SCC through increased road kills or accidental killing, and/or cause the displacement of mammal SCC via increased noise or air pollution. Several mammal SCC, including antelope, have been recorded or are likely to occur within the study area (refer to Section 3.4.2). Additionally, some mammal SCC may face the risk of being hunted, baited, or trapped by construction staff. However, many of the mammal SCC identified in this report, if not all, are able to move away from construction areas to more suitable habitats. As such, this impact is rated as slight negative.</p>	DIRECT	LOCALISED	PERMANENT	MAY OCCUR	LOW	REVERSIBLE	RESOURCES WILL PARTLY BE LOST	ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>▶ Mammal SCC encountered must be allowed to move away from the construction area. No mammal SCC may be removed off site without proper authorisation from the relevant authority.</li> <li>▶ All individuals, including construction workers must sign a register prior to accessing the construction area.</li> <li>▶ Construction workers must not be housed on site.</li> <li>▶ It is illegal to remove or kill any of the mammals within the study area that are listed as either Schedule I or II on the PNCO. Not all areas can be avoided, but it is recommended that construction staff are educated with regards to wildlife conservation and that all staff employed by the developer ensure that any mammals encountered are not harmed or killed.</li> <li>▶ No hunting, baiting, or trapping of mammals shall be allowed within the affected properties or surrounding properties by</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF EFFECT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	RESOURCES WILL BE LOST	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> Mammal SCC likely have been lost due to existing developments and activities within the study area, and the potential loss of mammal SCC associated with construction of the proposed development may contribute to the overall cumulative loss of SCC within the broader study area. As such, this impact is rated as slight negative.</p>	CUMULATIVE	STUDY AREA	PERMANENT	MAY OCCUR	LOW	REVERSIBLE	RESOURCES WILL PARTLY BE LOST	ACHIEVABLE	LOW (-)	<p>construction staff.</p> <ul style="list-style-type: none"> <li>The appointed ECO should inquire and undertake an overview inspection of the site for the evidence of snares during the construction phase.</li> <li>Where possible, mammal SCC observed on site must be recorded (photographed, GPS coordinates taken) and loaded onto iNaturalist by the appointed ECO.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative will not require the clearance of vegetation/soil and therefore will not result in the potential loss of mammal SCC. If the proposed development is not approved, mammal SCC are still likely to be disturbed and/or killed due to other activities taking place in the study area such as farming and forestry. The no-go alternative therefore is rated slight negative.</p>	NO-GO	NO IMPACT						NA	NA	NA	NA
COMPLIANCE, COMPATIBILITY, ALIGNMENT WITH BIODIVERSITY AND ENVIRONMENTAL PLANNING TOOLS	<p><b>Direct impacts</b> The construction of Mulilo Newcastle WEF will result in the loss of a portion of an area classified as a CBA: Irreplaceable, a CBA: Optimal; and an ESA (Ezemvelo 2016). The classification of these areas was driven by the vegetation type, threat status, and the established national conservation target. Even though the site has been impacted by agricultural activities and the <i>Acacia mearnsii</i> plantation, a systematic biodiversity planning algorithm will still select a site to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. Construction within these areas would therefore affect national conservation targets.</p>	DIRECT	LOCALISED	PERMANENT	DEFINITE	SEVERE	IRREVERSIBLE	RESOURCE WILL BE LOST	DIFFICULT	HIGH (-)	<p><b>GREENER TO CHECK</b></p> <ul style="list-style-type: none"> <li>Where possible, infrastructure should be placed outside of areas classified as CBA: Irreplaceable.</li> <li>Plantations of alien and invasive trees throughout the properties should be eradicated to ensure a net gain in terms of biodiversity, ecosystem function and natural condition.</li> <li>Laydown areas should be located within previously disturbed areas.</li> <li>Existing roads must be utilised as far as practically and feasibly possible.</li> <li>The footprint of turbine hardstands, pylons, roads, and other project related infrastructure must be micro-sited prior to construction. Should populations of threatened SCC be identified during micro-siting, the design and placement of the project components should be amended to avoid these populations. If this is not possible, permits for the removal and translocation of these populations must be obtained. Should translocation of threatened SCC be required, threatened SCC must be translocated within the same habitat type by a qualified botanist/horticulturalist.</li> </ul>	MODERATE (-)
	<p><b>Cumulative impacts</b> Portions of CBAs and ESAs have already been lost within the region due to other developments. The construction of the Newcastle WEF and Grid Connection will contribute to the cumulative loss of areas classified as CBA: Irreplaceable, CBA: Optimal and ESA which could affect national conservation targets.</p>	DIRECT	LOCALISED	PERMANENT	DEFINITE	HIGH	IRREVERSIBLE	RESOURCE WILL BE LOST	N/A	HIGH (-)	<ul style="list-style-type: none"> <li>The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A
	<p><b>No-go alternative</b> The No-go alternative will not result in the loss of areas classified as CBA and ESA. However, it should be noted that the current impacts such as grazing, and the infestation of alien plant species will continue.</p>	NO-GO	NO IMPACT						NA	NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
		OF	L	RAL	NTY	TY /	SABILITY	ACEAB	TION			
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS	<p><b>Direct impacts</b></p> <p>Grasslands are considered important water production landscapes and provide various ecosystem services such as soil formation, climate regulation and erosion prevention, etc. (SANBI, 2013). The two (2) key ecological drivers of grassland ecosystems include climate and fire which influences their character, community structure, composition, and primary productivity. In addition to climate and fire, other ecological drivers influencing these factors include grazing, soil types, and nutrient status. Construction within this ecosystem could result in the disruption of ecological drivers and the subsequent disruption of ecosystem function and process.</p>	DIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	DIFFICULT	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ The clearance of vegetation must be strictly limited to that which is necessary for the construction of turbine hard stands, roads, pylons, and other project related infrastructure.</li> <li>▶ Laydown areas should be located within previously disturbed areas.</li> <li>▶ Any impacted areas outside of the development footprint must be rehabilitated using indigenous plant species commonly occurring within vegetation types of the project area.</li> <li>▶ Existing access roads should be utilised.</li> </ul>	MODERATE (-)
	<p><b>Cumulative impacts</b></p> <p>Disruption of ecosystem function and process due to habitat degradation and/or fragmentation has already occurred within MNWP due to (1) existing infrastructure such as fences and roads, (2) current minor disturbances such as cultivated land and rural settlement, (3) past minor disturbances such as an artificial dam and fallow lands, and (4) major disturbance such as alien invasive plantations. The development footprint of MNWP is expected to be about 147 ha in extent and considering the extent of remaining intact habitat (approximately 2325 ha) surrounding the development footprint, the cumulative impact associated with MNWP and associated infrastructure is therefore classified as moderate.</p>	DIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A
	<p><b>No-go alternative</b></p> <p>Under the no-go alternative, habitat degradation and/or fragmentation will continue to occur because of infestation of invasive alien plant species such as <i>Acacia mearnsii</i>. This will continue to occur if left unchecked. Under the no-go alternative the impact is therefore low negative.</p>	NO-GO	STUDY AREA	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE MAY BE LOST	N/A	LOW (-)	N/A	N/A
ESTABLISHMENT OF ALIEN PLANT SPECIES	<p><b>Direct impacts</b></p> <p>The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems. Alien invasive species already present on site such as <i>Acacia mearnsii</i>, <i>A.dealbata</i>, <i>Cirsium vulgare</i>, <i>Solanum</i> spp., amongst others, can become quickly established and invasive.</p>	DIRECT	STUDY AREA	LONG-TERM	POSSIBLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ The site must be checked regularly for the presence of alien invasive species.</li> <li>▶ All alien invasive species that establish because of the proposed development must be removed and disposed of as per the Working for Water Guidelines.</li> <li>▶ An Alien Invasive Management Plan must be compiled and implemented for MNWP of the proposed Newcastle WEF Complex and included in the EMPr.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Scattered alien invasive species have already established in the surrounding area. Therefore, should the construction of the proposed Newcastle WEF and Grid Connection lead to the further establishment of alien invasive species in the project area, the invasion by alien species could be exacerbated. The cumulative impact associated therewith has therefore been classified as moderate.</p>	CUMULATIVE	STUDY AREA	LONG-TERM	POSSIBLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	MODERATE (-)	<ul style="list-style-type: none"> <li>▶ The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A





ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREVERSIBILITY	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	commencing. The final method statement must be reviewed by a wetland / freshwater specialist prior to commencement and must include all measures provided in this section where relevant and applicable. The following guidelines should be included in the method statement as detailed in the Aquatic Impact Assessment report:  A. Wetland Crossings ▲ Site Setup ▲ Site clearing and stripping ▲ Running Track and Soil Stockpile Corridor Establishment ▲ Temporary flow diversion and dewatering ▲ Runoff, erosion and sediment control ▲ Rehabilitation	LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA
WATER QUALITY IMPACTS	<b>Direct impacts</b> <ul style="list-style-type: none"> <li>Pollution of rivers and/or wetlands on the site and possibly also downstream, due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction (e.g. oil and diesel leaks and spills).</li> <li>Any erosion leading to sedimentation of rivers and wetlands onsite/downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality.</li> </ul>	DIRECT	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	<b>Runoff, erosion and sediment control</b> ▲ Wherever possible, existing vegetation cover on the development site should be maintained during the construction phase. The unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes which will not be developed. ▲ Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts. ▲ Sediment barriers (e.g.: silt fences/sandbags/hay bales) must be installed immediately downstream of active work areas (including soil stockpiles) as necessary to trap any excessive sediments generated during construction. ▲ All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of hay-bales, sandbags and/or silt fences aligned along the contours and spaced at regular intervals (e.g. every 2m) to break the energy of surface flows. ▲ Once shaped, all exposed/bare surfaces and embankments must be re-vegetated immediately. ▲ If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence. ▲ All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully recolonised the affected areas. ▲ After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until vegetation has re-	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	<b>Direct impacts</b> <ul style="list-style-type: none"> <li>Laydown areas will result in a temporary reduction in localised ecological connectivity for fauna.</li> <li>Expanded / more intense edge impacts could occur as a result of buffer zone encroachment, deterioration in vegetation quality and cover and the potential for increased alien invasive plant invasion due to disturbance causing activities near to rivers and wetlands.</li> <li>Noise pollution and vibrations associated with earthworks and the use of heavy machinery could affect local wildlife (birds, amphibians and small mammals especially).</li> <li>Light pollution associated with construction crews and the use of heavy machinery use at night which could affect locally occurring nocturnal wetland species, such as amphibians, however this would only be significant during certain times of the year.</li> </ul>	DIRECT	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE - LOW (-)	LOW (-)	





ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREVERSIBLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
INDIRECT HYDROLOGICAL AND GEOMORPHOLOGICAL IMPACTS	<p><b>Indirect impacts</b></p> <ul style="list-style-type: none"> <li>Erosion and/or sedimentation of rivers and/or wetlands due to catchment soil and vegetation clearing and landcover disturbance during construction. Soil erosion could result if not properly managed given the steep terrain and erodible soils of the site. Erosion and sedimentation impacts to wetlands include reduced wetland soil saturation due to flow concentration and/or vegetation burial. Erosion and sedimentation impacts to rivers include channel bank and bed modification and alteration in instream aquatic biotopes and riparian habitat.</li> <li>Erosion and/or sedimentation of rivers and/or wetlands due to the disturbance of soil and vegetation and alteration / diversion of flows during the establishment and/or upgrade or access road watercourse crossings. Erosion and sedimentation impacts to wetlands include reduced wetland soil saturation due to flow concentration and/or vegetation burial. Erosion and sedimentation impacts to rivers include channel bank and bed modification and alteration in instream aquatic biotopes and riparian habitat.</li> <li>Reduced water inputs where poorly planned and aligned roads intercept subsurface water movement and preferential subsurface flows paths and/or if activities cause additional soil piping and sinkholes that could intercept subsurface flows.</li> </ul>	INDIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE – HIGH (-)	<p>for IAPs every two weeks and IAPs removed by hand pulling/uprooting and adequately disposed.</p> <ul style="list-style-type: none"> <li>Herbicides should be utilised where hand pulling/uprooting is not possible. ONLY herbicides which have been certified safe for use in wetlands by independent testing authority are to be used. The ECO must be consulted in this regard. The herbicide contractor must be certified to apply/utilise the herbicide in question.</li> </ul> <p><b>Noise, dust and light pollution minimisation</b></p> <ul style="list-style-type: none"> <li>Temporary noise pollution due to construction works should be minimized by ensuring the proper maintenance of equipment and vehicles and tuning of engines and mufflers as well as employing low noise equipment where possible.</li> <li>Water trucks will be required to suppress dust by spraying water on affected areas producing dust. This will likely be required daily in the drier months or during dry periods.</li> <li>No lights must be established within the construction area near the watercourses and buffer zones.</li> </ul> <p><b>Prohibitions related to animals</b></p> <ul style="list-style-type: none"> <li>The handling and/or killing of any animal species present is strictly prohibited and all staff/personnel must be notified of such incidents.</li> <li>Wetland fauna (e.g. snakes, frogs, small mammals) that are encountered during the construction phase must be relocated to other parts of the wetland under the guidance of the EO or ECO.</li> <li>Poaching/snaring is strictly prohibited.</li> </ul> <p><b>General rehabilitation guidelines</b></p> <ul style="list-style-type: none"> <li>All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated immediately to the satisfaction of the ECO.</li> <li>All land impacted by the proposed development must be rehabilitated by undertaking the following general tasks: <ul style="list-style-type: none"> <li>All foreign material must be removed from site.</li> <li>Land must be regraded / re-shaped and topsoils must be reinstated.</li> <li>Compacted soils must be adequately ripped/loosened where compacted, as informed by the ECO.</li> </ul> </li> <li>Re-vegetation should take place as follows: <ul style="list-style-type: none"> <li>For any permanently and seasonally saturated areas - via translocation / transplanting of resecured sods and, where there are not enough rescued sods, via the translocation / transplanting of sods from the surrounding wetland as advised a wetland ecologist.</li> </ul> </li> </ul>	MODERATE - LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE – HIGH (-)		MODERATE - LOW (-)
	<p><b>No-go alternative</b></p> <p>No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
WATER QUALITY IMPACTS	<p><b>Direct impacts</b></p> <ul style="list-style-type: none"> <li>Pollution of rivers and/or wetlands on the site and possibly also downstream, due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction (e.g. oil and diesel leaks and spills).</li> <li>Any erosion leading to sedimentation of rivers and wetlands onsite/downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality.</li> </ul>	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF SPATIAL	TEMPORAL	CERTAINTY	SEVERITY / REVERSIBILITY	IRREVERSIBILITY	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION		
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE (-)	<p>For temporary and dryland areas - via hydroseeding using an appropriate indigenous seed mix as advised by a qualified ecologist.</p> <p><b>Construction phase monitoring measures</b></p> <ul style="list-style-type: none"> <li>Compliance monitoring will be the responsibility of a suitably qualified/trained ECO (Environmental Control Officer) with any additional supporting EO's (Environmental Officers) having the required competency skills and experience to ensure that monitoring is undertaken effectively and appropriately.</li> <li>A photographic record of the state of the onsite wetlands prior to the commencement of clearing/construction must be kept for reference and rehabilitation monitoring purposes.</li> <li>The ECO must <b>undertake bi-monthly compliance</b> monitoring audits. Freshwater ecosystem aspects that must be monitored related to monitoring freshwater ecosystem impacts include: <ul style="list-style-type: none"> <li>The condition of the demarcation fence.</li> <li>Evidence of any no-go area incursions.</li> <li>The condition of the temporary runoff, erosion and sediment control measures and evidence of any failures.</li> <li>Evidence of sedimentary deposits / plumes and elevated rates of sedimentation (i.e. vegetation smothering / burial).</li> <li>Evidence of elevated river / stream turbidity levels.</li> <li>Evidence of gully or bed/bank erosion.</li> <li>Visual assessment of stormwater quality and instream water quality.</li> <li>The condition of waste bins and the presence of litter within the working area.</li> <li>Evidence of solid waste within the no-go areas.</li> <li>Evidence of hazardous materials spills and soil contamination.</li> <li>Presence of alien invasive and weedy vegetation within the working area.</li> <li>Rehabilitation and re-vegetation methods and success.</li> <li>Once the construction and rehabilitation has been completed, the ECO should conduct a close out site audit 1 month after the completion of rehabilitation.</li> </ul> </li> </ul>	LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT						NA		NA	
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	<p><b>Direct impacts</b></p> <ul style="list-style-type: none"> <li>Decreased local ecological connectivity as a result of the establishment of new road watercourses crossings and/or the upgrade of existing crossings. The construction corridor will act as a temporary barrier to faunal movement.</li> <li>Formation of artificial barriers to local aquatic fauna movement (macroinvertebrates, fish and frogs) during temporary flow diversions and impoundments during construction.</li> <li>Expanded / more intense edge impacts could occur as a result of buffer zone encroachment, deterioration in vegetation quality and cover and the potential for increased alien invasive plant invasion due to disturbance causing activities near to rivers and wetlands.</li> <li>Noise pollution and vibrations associated with earthworks and the use of heavy machinery could affect local wildlife (birds, amphibians and small mammals especially).</li> <li>Light pollution associated with construction crews and the use of heavy machinery use at night which could affect locally occurring nocturnal wetland species, such as amphibians, however this would only be significant during certain times of the year.</li> </ul>	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE-LOW (-)		
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE-LOW (-)		
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT						NA		NA	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>AVIFAUNAL IMPACT ASSESSMENT</b>												
<b>DIRECT HABITAT DESTRUCTION</b>	<p><b>Direct impacts</b> 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.</p> <p>The habitats present in the proposed development site are not unique to the site and the agricultural/natural land-use matrix is similar throughout the broader area.</p> <p>The more natural or near-natural grasslands that remain in these areas are, however, under increasing pressure from various other impacts such as commercial crop production and rangeland grazing/burning mismanagement.</p> <p>The loss of habitat associated with clearing will not likely have a significant negative impact on the long term viability or persistence of avifaunal species or populations in the area following the implementation of appropriate mitigation measures.</p>	DIRECT	STUDY AREA	LONG TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>▲ Infrastructure to avoid Very High Sensitivity areas, linear infrastructure permitted;</li> <li>▲ The footprint within High Sensitivity areas must be minimized and avoided wherever possible;</li> <li>▲ Laydown and other temporary infrastructure to be placed within Low or Medium sensitivity areas, preferably previously transformed areas, wherever possible;</li> <li>▲ Appropriate run-off and erosion control measures must be implemented where required;</li> <li>▲ 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);</li> <li>▲ All contractors are to adhere to the EMPr and must apply good environmental practice during construction;</li> <li>▲ 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;</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	LONG TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>▲ Existing roads and farm tracks must be used where possible;</li> <li>▲ The minimum footprint areas of infrastructure must be used wherever possible, including road widths and lengths;</li> <li>▲ No off-road driving must be permitted in areas not identified for clearing;</li> <li>▲ An Environmental Site Officer (ESO) 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</li> <li>▲ Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEABLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>DISTURBANCE AND DISPLACEMENT</b>	<p><b>Direct impacts</b></p> <p>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.</p> <p>Disturbance resulting from grazing of livestock occur within the natural or near natural areas and therefore it is expected that any species particularly sensitive to anthropogenic disturbance are unlikely to occur within the proposed project area through displacement by existing impacts.</p> <p>The habitats present in vicinity of the proposed development are not unique to the site and are relatively widespread in the area so any displacement from the immediate vicinity that may occur will not likely incur a high energetic cost as suitable habitat is widely available nearby. The proximity of nearby suitable habitat makes it likely that species will return to areas that have not been physically altered by the proposed development once construction activity ceases.</p> <p>There are no confirmed active nest locations in proximity to the proposed development site where breeding success is likely to be negatively impacted upon through disturbance or displacement during the construction phase.</p>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>▶ A site specific EMPr must be developed and implemented. The EMPr must give appropriate and detailed description of how construction activities must be conducted;</li> <li>▶ All contractors are to adhere to the EMPr and must apply good environmental practice during construction;</li> <li>▶ The ECO must oversee activities and ensure that the site specific EMPr is implemented and enforced;</li> <li>▶ Maximum use of existing access road and servitudes;</li> <li>▶ 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;</li> <li>▶ No off-road driving in undesignated areas;</li> <li>▶ Speed limits (40 km/h) must be strictly enforced on site to reduce unnecessary noise;</li> <li>▶ Construction camps must be lit with as little light as practically possible, with the lights directed downwards where appropriate;</li> <li>▶ The movement of construction personnel must be restricted to the construction areas on the project site;</li> <li>▶ No dogs or cats other than those of the landowners must be allowed on site;</li> <li>▶ 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;</li> <li>▶ 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</li> <li>▶ 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.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPrs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>▶ 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.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b></p> <p>No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>DIRECT MORTALITY</b>	<p><b>Direct impacts</b></p> <p>Fatalities of avifaunal species can occur through collision with vehicles as traffic in the area increases due to construction activity.</p> <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 and the presence of these species across the site was low.</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>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>Maximum use of existing access road and servitudes;</li> <li>No off-road driving in undesignated areas;</li> <li>Speed limits (50 km/h) must be strictly enforced on site to reduce probability of vehicle collisions;</li> <li>The movement of construction personnel must be restricted to the construction areas on the project site;</li> <li>No dogs or cats other than those of the landowners must be allowed on site;</li> <li>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;</li> <li>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</li> <li>Roadkill must be reported to the ECO and removed as soon as possible.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)		LOW (-)
	<p><b>No-go alternative</b></p> <p>No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA	NA	NA
<b>BAT IMPACT ASSESSMENT</b>												
<b>HABITAT MODIFICATION</b>	<p><b>Direct impacts</b></p> <p>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 wind farm area.</p>	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>The removal of vegetation and manmade buildings should be avoided in all high sensitive areas, as far as possible, and reduced across the project site in all other areas.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)
	<p><b>No-go alternative</b></p> <p>No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA	NA	NA



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DISTURBANCE/DISPLACEMENT	<p><b>Direct impacts</b></p> <p>Wind Farms have the potential to impact bats indirectly during the 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, Operation and Maintenance (O&amp;M) buildings, sub-station(s), internal transmission lines and the installation of wind turbines.</p> <p>Excessive noise and dust during the construction phase could result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.</p>	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>Limit construction activities to daylight hours.</li> <li>Avoid all construction activities within potential roosting habitats, if identified at the time when construction activities (for wind turbines and associated infrastructures) take place. Although no confirmed roosts have been identified on site to date, it is recommended for a final specialist site walk-through to take place prior to construction to confirm this.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)
	<p><b>No-go alternative</b></p> <p>No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA	NA	NA
<b>HERITAGE IMPACT ASSESSMENT</b>												
	NONE											
<b>PALAEONTOLOGICAL IMPACT ASSESSMENT</b>												
DAMAGE TO FOSSIL DEPOSITS DURING CONSTRUCTION OF THE WEF	The Palaeontological Impact Assessment determined that since the areas underlain by significant fossiliferous lithologies are restricted to deep depressions and steep slopes, areas where turbine construction is very unlikely to impact on fossil resources and has determined the impact risk to be ZERO to LOW.	DIRECT	STUDY AREA	SHORT TERM	DEFINITE	ZERO-LOW	IRREVERSIBLE	RESOURCE WILL BE LOST	ACHIEVABLE	LOW (-)	The Palaeontological Impact Assessment has recommended that no further palaeontological work needs to be undertaken, unless the "Chance Find Protocol" is triggered.	LOW (-)
<b>NOISE IMPACT ASSESSMENT</b>												
DAYTIME ACTIVITIES RELATING TO THE CONSTRUCTION OF ACCESS ROADS	<p><b>Direct impacts</b></p> <p>Construction of the access roads during the day raising ambient sound levels in the area.</p> <p>Considering the ambient sound level measurements collected in the area, daytime sound levels could range between 59.9 and 28.3 dBA (see section 4.3).</p> <p>Daytime construction activities should not change the existing ambient sound levels with more than 7 dB, nor should the construction activities result in noise levels exceeding the daytime rating level for a rural noise district (45 dBA).</p>	DIRECT	STUDY AREA	SHORT TERM	UNLIKELY	SLIGHT	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>The significance of the noise impact is Low, and additional mitigation measures are not recommended or required.</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF EFFECT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREVERSIBLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	UNLIKELY	SLIGHT	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	LOW (-)	As above	LOW (-)	
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT								NA	NA	NA
<b>DAYTIME CONSTRUCTION TRAFFIC PASSING NSR</b>	<p><b>Direct impacts</b> Noises from construction traffic raising ambient sound levels in the area.</p> <p>Considering the ambient sound level measurements collected in the area, daytime sound levels could range between 59.9 and 28.3 dBA (see section 4.3).</p> <p>Daytime construction activities should not change the existing ambient sound levels with more than 7 dB, nor should the construction activities result in noise levels exceeding the daytime rating level for a rural noise district (45 dBA).</p>	DIRECT	STUDY AREA	SHORT TERM	UNLIKELY	SLIGHT	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	LOW (-)	^ The significance of the noise impact is Low, and additional mitigation measures are not recommended or required.	LOW (-)	
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be LOW should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	UNLIKELY	SLIGHT	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	LOW (-)	As above	LOW (-)	
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT								NA	NA	NA
<b>DAYTIME CONSTRUCTION ACTIVITIES AT MULILO NEWCASTLE WIND POWER WEF</b>	<p><b>Direct impacts</b> Noises from construction traffic raising ambient sound levels in the area.</p> <p>Considering the ambient sound level measurements collected in the area, daytime sound levels could range between 59.9 and 28.3 dBA (see section 4.3).</p> <p>Daytime construction activities should not change the existing ambient sound levels with more than 7 dB, nor should the construction activities result in noise levels exceeding the daytime rating level for a rural noise district (45 dBA).</p>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	HIGH	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	LOW (-)	The significance of the noise impact is Low, and additional mitigation measures are not recommended or required.	LOW (-)	



ISSUE	DESCRIPTION OF IMPACT	NATURE OF SPATIAL	TEMPORAL	CERTAINTY	SEVERITY / REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION		
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be LOW should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	HIGH	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	LOW (-)	As above	LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT						NA	NA	NA	
NIGHT-TIME CONSTRUCTION ACTIVITIES AT MULILO NEWCASTLE WIND POWER WEF	<p><b>Direct impacts</b> Noises created during various construction activities (civil work, erection of WTG) at night raising ambient sound levels in the area.</p> <p>Considering the ambient sound level measurements collected in the area, daytime sound levels could range between 49.5 and 22.0 dBA (see section Error! Reference source not found.).</p> <p>Night-time construction activities should not change the existing ambient sound levels with more than 7 dB, nor should the construction activities result in noise levels exceeding the daytime rating level for a rural noise district (35 dBA).</p>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SEVERE	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>The significance of the noise impact is Medium and additional mitigation measures are recommended as follows:</li> <li>The applicant should get written confirmation from NSR08 and 40 that the dwelling will not be used for residential purposes in the future.</li> <li>Only allow construction activities at one WTG location (closer than 1,200m from an NSR);</li> <li>The Applicant can reduce the total number of WTG located within 2,000m from NSR08 and 40; and</li> <li>Minimise active equipment at night, planning the completion of noisiest activities (such a pile driving, rock breaking and excavation) during the daytime period.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be LOW should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SEVERE	REVERSIBLE	RESOURCE NOT BE PARTIALLY LOST	ACHIEVABLE	MODERATE (-)	LOW (-)	
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT						NA	NA	NA	
<b>SOCIO-ECONOMIC IMPACT ASSESSMENT</b>												
TEMPORARY EMPLOYMENT	<p><b>Direct impacts</b> During the 24-month construction period 1 500 person-month employment opportunities will become available, of which 60% will be allocated to unskilled, 25% to semi-skilled and 15% to skilled workers.</p> <p>In addition to direct employment, the construction phase will have a positive spin-off effect on the economy (local, regional and national) through procurement of goods and services, with indirect and induced employment as result.</p>	DIRECT, INDIRECT	NATIONAL	SHORT-TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	MODERATE +	<p>Enhance benefit:</p> <ul style="list-style-type: none"> <li>Maximise local employment and local content (the Project's direct sending area) through the Preferential Procurement Plan and Contractor Social Management Plan (CSMP) for all contractors that are used.</li> <li>Involve local government structures from the early processes (from financial close already if possible). Determine their existing process with regards to a labour desk and streamline employment processes between the various stakeholders.</li> <li>Appoint a Community Employer Relations Officer / Community Liaison Officer (CLO). Communicate with communities through this one channel to ensure transparency, limit unrealistic expectations and to avoid conflict.</li> </ul>	MODERATE +



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY / REVERSIBILITY	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>TRAINING / SKILLS DEVELOPMENT / CAPACITY BUILDING</b>	<p><b>Direct impacts</b>            During the construction phase the following training initiatives would usually take place:</p> <ul style="list-style-type: none"> <li>▲ On-site training; and</li> <li>▲ Training by contractors to maintain their own BBEEE level, such as health and safety legislation training, first aid, fire-fighting, etc.</li> </ul> <p>An additional training / capacity building requirement has been identified, which relates to the capacity and knowledge constraints within local government during the implementation of RE projects.</p> <p>Municipalities are faced with challenges and responsibilities during the planning, construction and employment processes and do not always have the required skills, experience and/or capacities to fulfil these roles.</p> <p>These “new” duties and responsibilities that would befall on Officials relate to:</p> <ul style="list-style-type: none"> <li>▲ Collaboration with the IPP for permits for the submission of a compliant bid;</li> <li>▲ Management of stakeholder and community relations;</li> <li>▲ Involvement in the employment process by assisting the Community Employer Relations Officer with the job seeker registration database;</li> <li>▲ Participation in SMME training and SMME support programmes;</li> <li>▲ Monitoring of the construction site and processes to ensure compliance with municipal bylaws;</li> <li>▲ Monitoring and managing the influx jobseekers from outside the Project’s target area, and so forth.</li> </ul>	DIRECT, INDIRECT	REGIONAL	SHORT-TERM	PROBABLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	LOW (+)	Enhance benefits: <ul style="list-style-type: none"> <li>▲ Include the Newcastle, Dannhauser, Emadlangeni, Phumelela and the Dr Pixley Ka Isaka Seme LM’s LED Units in all relevant processes from the onset of the Project.</li> <li>▲ The developer is encouraged to take part / slot in with the various municipal initiatives and interventions to develop SMME’s to enable them to take part in the Project’s construction phase.</li> <li>▲ Where feasible the developer should:               <ul style="list-style-type: none"> <li>○ Make the skill requirements clear to the municipalities in advance and do a skills analysis of the available labour force.</li> <li>○ Do a Value-chain analysis of services required (directly and indirectly related to construction) and communicate this to local and district municipalities in advance so that they are prepared and equipped to take part in the tender process.</li> <li>○ Require larger contractors to work with small SMMEs to train and transfer skills and include this in their respective CSMP’s.</li> <li>○ Implement on-the-job training for unskilled workers.</li> <li>○ Capacitate the local government structures by involving them as early as possible in the Project; remain transparent throughout the processes.</li> <li>○ Negotiate a MoU with the municipalities so that each role-player is clearly aware of its roles, responsibilities and timelines in the Project processes.</li> </ul> </li> <li>▲ Establish an EMC or similar Forum for the duration of construction to aid communication and transparency with local government. Members of the EMC / Forum to meet on a quarterly basis to discuss issues that may arise during the course of the construction period (if feasible).</li> </ul>	MODERATE (+)
	<p><b>No-go alternative</b>            No training / skills development of a local labour force that would result in a better employable population and contribute to economic development.</p>	NO-GO	REGIONAL	SHORT-TERM	PROBABLE	SLIGHT	N/A	N/A	N/A	LOW (-)	NA	N/A
<b>EMPLOYMENT EQUITY</b>	<p><b>Direct impacts</b>            A minimum threshold of 30%, with a target of 50%, has been set for Black citizens in construction at the early stages of operations. An 18% minimum threshold and 30% target have been set for skilled Black citizens.</p> <p>Although minimum thresholds are prescribed for Black people in the construction process, no guidelines / thresholds currently exist to address employment equity for women, Youth and the disabled.</p> <p>However, the DMRE encourages the Project to procure with suppliers that have a BBEE Generic scorecard or who are Qualified Small Enterprises, Exempt Micro Enterprises and Women Owned Vendors.</p>	DIRECT	REGIONAL	SHORT-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	LOW (+)	Enhance benefits: <ul style="list-style-type: none"> <li>▲ Obtain inputs from the respective local and district municipalities on the contents of the Procurement strategy and Employment Equity Plan to be implemented.</li> <li>▲ Set targets for the employment of Youth, women and the disabled in the CSMPs.</li> </ul>	MODERATE (+)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEABLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>No-go alternative</b> No employment and skills development for PDI's will occur.	NO-GO	REGIONAL	SHORT-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	LOW (-)	NA	N/A

<p><b>IMPACTS ASSOCIATED WITH AN INFLUX OF JOBSEEKERS / TEMPORARY CONSTRUCTION WORKERS</b></p>	<p><b>Direct impacts</b>  The influx of jobseekers / temporary construction workers holds various challenges for municipalities and local communities that include:</p> <ul style="list-style-type: none"> <li>▲ Conflict between locals and 'outsiders' if the outside labour force receives preference;</li> <li>▲ Conflict due to cultural differences;</li> <li>▲ Increase in the size and number of informal settlements and additional pressure on local government for housing and related services;</li> <li>▲ Increase in the unemployment rate if jobseekers and/or workers do not return to their places of residence post construction;</li> <li>▲ Unwanted pregnancies, an increase in HIV/AIDS and other sexually transmitted diseases (STDs) and additional pressure on health care services;</li> <li>▲ An increase in single parent households and a subsequent reliance on social grants;</li> <li>▲ An increase in drug and alcohol abuse and other social issues should unemployment levels increase.</li> </ul> <p>In addition, poor conduct of construction workers and inadequate management of the construction site could result in health and safety risks for landowners, such as:</p> <ul style="list-style-type: none"> <li>▲ Unauthorized access / trespassing resulting in theft, poaching, safety and security issues as well as potential damage to the veld and natural grazing;</li> <li>▲ Fire hazards and the possibility of fires spreading and damaging surrounding farmland and infrastructure;</li> <li>▲ Pollution problems, flies, rodents and pests and possible contamination of water resources (insufficient sanitation facilities, littering and refuse) and so forth.</li> </ul>	<p>DIRECT, INDIRECT</p>	<p>REGIONAL</p>	<p>SHORT-TERM</p>	<p>POSSIBLE</p>	<p>MODERATE</p>	<p>REVERSIBLE</p>	<p>RESOURCE WILL BE PARTLY LOST</p>	<p>DIFFICULT</p>	<p><b>MODERATE (-)</b></p>	<p>Minimize/reduce impact:  <u>Employment / Temporary construction workers:</u></p> <ul style="list-style-type: none"> <li>▲ Clearly identify the beneficiary communities / labour sending area and compile the employment strategy in collaboration with the affected municipalities' LED Units.</li> <li>▲ Encourage the affected local municipalities to draw up a cooperation agreement that specifies the percentages of the workforce that will be sourced from each municipality.</li> <li>▲ Ensure that the Community Employer Relations Officer /CLO has knowledge of the local communities, is educated with good public relation skills, committed to the cause and is accessible for community members.</li> <li>▲ Contractually oblige contractors and sub-contractors to only source labour through the labour desk / job registration database and make this known to the target communities.</li> <li>▲ Work through limited communication channels (e.g. Ward Councillors and the Employer Relations Officer / CLO).</li> <li>▲ Be vigilant not to raise unrealistic expectations amongst the local communities and workers with regards to employment, skills requirements, local procurement and so forth. Ensure transparency through the Ward Councillors, CLO and the EMC / Forum.</li> <li>▲ No recruitment of temporary workers at the access to the construction site.</li> <li>▲ As part of their CSMP's, contractors to provide a transport and housing plan: (i) no workers are allowed to be housed on site or in informal housing / settlements; (ii) allow workers that do not live nearby time to return to their families at regular intervals or over weekends.</li> <li>▲ No workers to remain on site after shifts.</li> <li>▲ No informal traders to be allowed on or near the construction site/s.</li> <li>▲ It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.</li> </ul> <p><u>Security, safety and environmental health:</u></p> <ul style="list-style-type: none"> <li>▲ Do a security risk assessment (if required) and base the exact security measures on the detailed assessment of the risks at the site.</li> <li>▲ 24-hour security, demarcate and fence the construction site (if possible), material stores to be secured, access control and no trespassing of workers outside designated construction areas.</li> <li>▲ Join the local community policing forum and similar initiatives (e.g. Amajuba District Fire Technical Task Team) for the duration of construction.</li> <li>▲ Keep the local SAPS, other emergency services, Ward Councillors, landowners and other relevant stakeholders informed about the construction progress and time-lines.</li> <li>▲ Develop a Fire / Emergency Management Plan in conjunction with affected and neighbouring landowners.</li> <li>▲ Dispose of the various types of waste generated in the appropriate manner at licensed waste landfill sites at regular intervals. Comply with the waste management plan compiled for the construction phase.</li> <li>▲ Display "danger" warning signs and "no public access" signs at</li> </ul>	<p><b>LOW (-)</b></p>
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ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY / REVERSIBILITY	IRREVERSIBILITY	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
										<p>all potential accesses, paths and along the periphery of the construction areas in English and the local languages.</p> <ul style="list-style-type: none"> <li>▲ If water for construction is obtained from a natural water resource, comply with the Water Use Licence conditions for the duration of the construction period.</li> <li>▲ Ensure implementation of the provisions of the Occupational Health and Safety Act No. 85 of 1993 and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.</li> </ul> <p><u>Awareness / community engagement:</u></p> <ul style="list-style-type: none"> <li>▲ Keep open communication channels with the landowners and address any potential issues as a matter of priority.</li> <li>▲ Make contact details of the main contractor and procedures to lodge complaints available to landowners and the local communities through the Ward Councillors and EMC / Forum.</li> <li>▲ Make a complaints register / log book available at the entrance to the construction site and act immediately should issues arise.</li> <li>▲ Consult with surrounding landowners whose livestock, private residences and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement and general construction activities.</li> <li>▲ Where required, draw up a land use management plan with individual landowners to protect livestock and farmland, which addresses restricted access areas, procedures when farm gates are opened and closed and so forth.</li> </ul> <p><u>Remediate/rehabilitate impact:</u></p> <ul style="list-style-type: none"> <li>▲ Rehabilitate the veld to its original state post construction.</li> </ul>	
	<p><b>No-go alternative</b> Negative impacts associated with an influx of a temporary workforce will not manifest for landowners nor the NLM.</p>	NO-GO	NO IMPACT						N/A	NA	N/A
<b>LAND USE AND RESOURCE IMPACTS</b>	<p><b>Direct impacts</b> No impacts on residential land uses will occur. Based on 3 ha/LSU, grazing for about 35 LSU will be lost during construction (105 ha).</p> <p>Soil erosion will be minimal, provided that the Stormwater Management Plan is implemented.</p> <p>Water will be sourced from an alternative source and WUL obtained. Water for the Project may not be obtained from an existing source as it might impact negatively on agricultural production.</p>	DIRECT	LOCALISED	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	<p><b>LOW (-)</b></p> <p>Minimise/reduce impact:</p> <ul style="list-style-type: none"> <li>▲ Implement all the mitigation and management measures as proposed in the Agricultural Study.</li> <li>▲ Implement the Stormwater Management Plan for the duration of construction.</li> </ul> <p><u>Remediate/rehabilitate impact:</u></p> <ul style="list-style-type: none"> <li>▲ Rehabilitate the veld to its original state post construction.</li> <li>▲</li> </ul>	<b>LOW (-)</b>
	<p><b>No-go alternative</b> No impact on current land use and resources.</p>	NO-GO	NO IMPACTS						N/A	NA	N/A



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREVERSIBILITY	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
IMPACTS ON TOURISM / ACCOMMODATION FACILITIES / PROTECTED AREAS	<p><b>Direct impacts</b></p> <p>Negative impacts on existing tourist / accommodation establishments may occur during the construction phase as a result of construction vehicle movement, visual / aesthetic impacts, dust and a possible increase in crime due to an inflow of jobless people. This would translate into financial losses if construction activities deter tourists to frequent the facilities. It is however anticipated that professionals deployed from other parts of the province and country be housed in local accommodation facilities, with positive impacts on tourism revenue. Approximately 15% of the workforce will be skilled (225 person-months) and will in all likelihood be sourced nationally where the required skills for the construction of large-scale wind farms already exist. Tertiary education levels in the NLM are also very low (10%) and the required skills will most likely not be available locally. It is thus the opinion of the SEIA Consultant that the positive off-set when workers are housed in local establishments will be greater when measured against potential tourism losses over the 24-month construction period.</p>	INDIRECT	STUDY AREA	SHORT-TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	LOW (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▶ Implement all measures proposed in the SEIA and other Specialist Assessments to mitigate intrusion impacts (dust, noise, visual) during construction.</li> <li>▶ Implement all mitigation measures related to awareness/community engagement as proposed in the section dealing with 'Impacts associated with an influx of jobseekers / temporary construction workers'; keep open communication channels with affected tourism establishments and address potential issues proactively.</li> <li>▶ Give preference to accommodation establishments in the local study area when workers are housed.</li> </ul>	LOW (+)
	<p><b>No-go alternative</b></p> <p>No economic impact (positive or negative) for tourism establishments as a result of construction.</p>	NO-GO	STUDY AREA	SHORT-TERM	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A
HEALTH AND SAFETY RISKS FOR WORKERS	<p><b>Direct impacts</b></p> <p>The Occupational Health and Safety Act (Act No. 85 of 1993) makes provision for the health and safety of workers at construction sites. These risks are broadly associated with:</p> <ul style="list-style-type: none"> <li>▶ Construction related accidents due to structural safety of Project infrastructure, possibly resulting in fatalities;</li> <li>▶ Dust generation and air pollution resulting in respiratory diseases;</li> <li>▶ High ambient noise levels caused by machinery and construction equipment resulting in loss in hearing or similar health issues;</li> <li>▶ Dehydration, sunburn and related issues due to unsafe and insufficient drinking water and high temperatures during summer months; and</li> <li>▶ An increase in HIV/AIDS and other STDs due to prostitution activities and temporary sexual relationships with local women, unwanted pregnancies that place further pressure on Basic Health Care Services, etc.</li> </ul>	DIRECT	LOCALISED	SHORT-TERM	POSSIBLE	IRREVERSIBLE	RESOURCE WILL BE LOST	ACHIEVABLE	MODERATE (-)	<p>Minimise/reduce impact:</p> <ul style="list-style-type: none"> <li>▶ Ensure implementation of the provisions of the Occupational Health and Safety Act (Act No. 85 of 1993) and adhere to the Emergency and Safety plan procedures for the duration of the construction phase.</li> <li>▶ Promote good conduct of employees through awareness campaigns. It is also recommended that the Developer embarks on a Social Awareness Campaign for the workforce that focuses on sexual health, unwanted pregnancies and related social issues.</li> <li>▶ Contractors to provide a housing plan that makes provision for workers that do not live nearby to return to their families at regular intervals or over weekends.</li> <li>▶ Suitable fire fighting equipment should be on-site and workers should be appropriately trained for fire fighting.</li> <li>▶ Construction workers to wear protective clothing (e.g. masks that minimize dust inhalation, clothing that protects against sunburn) and earplugs.</li> <li>▶ Lock away dangerous plant, equipment and material when not supervised or in use.</li> <li>▶ Provide safe and clean drinking water and instil regular water breaks to keep workers hydrated.</li> <li>▶ Provide sufficient ablution facilities (chemical/portable toilets, etc.) at strategic locations that are cleaned regularly.</li> <li>▶ Keep the local police, emergency and ambulance services informed of construction times and progress.</li> <li>▶ Implement measures to suppress dust.</li> </ul>	LOW (-)	
	<p><b>No-go alternative</b></p> <p>Health and safety impacts for workers will not manifest.</p>	NO-GO	NO IMPACTS							N/A	NA	N/A



ISSUE	DESCRIPTION OF IMPACT	NATURE OF EFFECT	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY	REVERSIBILITY	IRREVERSIBILITY	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>VISUAL IMPACT ASSESSMENT</b>												
<b>POTENTIAL VISUAL IMPACT OF CONSTRUCTION ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE FACILITY</b>	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 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. This impact is likely to be of high significance before mitigation and moderate significance post mitigation.	DIRECT	LOCALISED	SHORT-TERM	HIGHLY PROBABLE	HIGH	REVERSIBLE	NO	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>Ensure that vegetation is not unnecessarily removed during the construction period.</li> <li>Reduce the construction period through careful logistical planning and productive implementation of resources.</li> <li>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.</li> <li>Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.</li> <li>Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.</li> <li>Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).</li> <li>Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.</li> <li>Rehabilitate all disturbed areas immediately after the completion of construction works.</li> </ul>	MODERATE (-)
	<b>Cumulative impacts</b> No cumulative impacts as a result of the construction activities are expected.	CUMULATIVE	NO IMPACTS							NA	NA	NA
	<b>No-go alternative</b>	NO-GO	NO IMPACTS							NA	NA	NA
<b>TRAFFIC IMPACT ASSESSMENT</b>												
<b>TRAFFIC CONFLICT AND CONGESTION DURING CONSTRUCTION OF THE WEF</b>	The Traffic Feasibility Assessment considered the following main traffic impacts related to the following aspects: <ul style="list-style-type: none"> <li>Existing operating conditions;</li> <li>Traffic volumes;</li> <li>Internal traffic circulation and parking;</li> <li>Access proposals;</li> <li>Road improvements;</li> <li>Building lines; and</li> <li>Abnormal loads.</li> </ul>	DIRECT	REGIONAL	SHORT-TERM	PROBABLE	MODERATE	REVERSIBLE	NO	ACHIEVABLE	MODERATE (-)	<p><b>Traffic and Transportation Management Plan</b></p> <ul style="list-style-type: none"> <li>The Traffic and Transportation Management Plan provided in the TIA must be followed and implemented during the construction phase of the WEF.</li> </ul> <p><b>Building lines</b></p> <ul style="list-style-type: none"> <li>All other structures shall be erected at least 60m from a national or provincial road reserve fence and 500m from an intersection.</li> </ul> <p><b>R34/Access Road intersection</b></p> <ul style="list-style-type: none"> <li>There must be no vehicular accesses permitted onto the R34 other than at the proposed/existing access. It is therefore recommended that a suitable barrier be erected to prohibit such access. In this regard, the current fence serves such purpose.</li> <li>Vegetation should be cleared (in the form of cutting the long grass) on the two southern corners of the R34 access intersection.</li> </ul> <p><b>Abnormal load vehicles</b></p> <ul style="list-style-type: none"> <li>During the construction stage the abnormal load vehicles</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF	SPATIAL	TEMPORAL	CERTAINTY	SEVERITY /	REVERSIBILITY	IRREPLACEMENT	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
											<p>expected at the site will require the bell mouth of the R34/Access Road intersection to be increased to accommodate the large turning radius of these vehicles. The extent of the widening must be determined at the detailed design stage.</p> <p><b>Internal roads</b></p> <ul style="list-style-type: none"> <li>The internal gravel roadways should be designed in accordance with the Guidelines for Human Settlement Planning and Design ("The Redbook"). Geometric designs of the roads should ensure that the requirements of all types of vehicles expected to visit the site are met, i.e. minimum turning radii, roadway widths, etc. The pavement design, where necessary, will form part of the detailed design stage.</li> </ul> <p><b>General traffic and transportation</b></p> <ul style="list-style-type: none"> <li>All road works must comply with the SARTSM, Chapter 13 and Volume 2.</li> <li>Temporary traffic control zone signs must be adequate in order to convey both general and specific messages to the road users.</li> <li>Adequate signage must be placed on the roads, such as: speed limits, caution: electrical road works in progress, use of alternative roads, stop/go signs, flagman ahead, etc.</li> </ul> <p><b>Transporting of construction staff</b></p> <ul style="list-style-type: none"> <li>Company transport must be in the form of appropriate transportation vehicle/s. No persons must be transported in the back of a bakkie.</li> </ul> <p><b>Site access control</b></p> <ul style="list-style-type: none"> <li>Access control must be managed at the gate to ensure that no authorized person enters the site unless a valid access card is presented at the gate to the security guards.</li> <li>Control at pick-up locations prior to entering the transportation vehicle/s, must ensure that no unauthorized person enters the site.</li> <li>All persons must be inducted before entering the gate and proof of induction must be kept for inspection purposes.</li> <li>Upon entering the site all persons must undergo alcohol testing.</li> <li>All vehicles entering the site must have a beacon light and a whip and flag to ensure that these vehicles are visible.</li> <li>Necessary signage must be placed where needed and only vehicles designated as construction vehicles will be allowed to travel on the main roads.</li> <li>No private vehicles should be allowed to travel on the main roads. Those travelling with private vehicles should be escorted to the site with their vehicles and from there escorted in designated construction vehicles.</li> </ul> <p><b>Parking areas</b></p> <ul style="list-style-type: none"> <li>Designated parking areas must be identified on site where vehicles will park during the day.</li> <li>A designated walkway should also be created which should be barricaded, whereby workers can walk to access their work areas.</li> </ul>	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY	SEVERITY / BENEFICIALITY	REVERSIBILITY	IRREPLACEABLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
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ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY	SEVERITY / BENEFICIALITY	REVERSIBILITY	IRREPLACEABLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>AGRICULTURAL IMPACT ASSESSMENT</b>												
LOSS OF HIGH CULTIVATED OR HIGH POTENTIAL AGRICULTURAL LAND	<b>Direct impacts</b> There is no high potential or unique land or land that is irrigated on or in proximity of available surface water. No high potential or unique land will be lost.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	No mitigation necessary	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA		NA
LOSS OF GRAZING LAND	<b>Direct impacts</b> The land on the construction site will remain as grazing after construction. The construction footprint is the only area is permanently lost.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<ul style="list-style-type: none"> <li>Compensate farmers for what is lost.</li> <li>Keep the construction period as short as possible.</li> <li>Employ dust-suppressing practices to protect adjoining grazing land.</li> <li>Protect the land against soil erosion by following guidelines of the stormwater management plan.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA		NA
LOSS OF AGRICULTURAL PRODUCTION (YIELD AND INCOME)	<b>Direct impacts</b> The loss of grazing is the only impact that translates to income loss.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<ul style="list-style-type: none"> <li>Compensate farmers for what is lost.</li> <li>Keep the construction period as short as possible.</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / DENEGRATIONAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA	NA	NA
LOSS OF AGRICULTURAL RESOURCES	<b>Direct impacts</b> The loss of resources relates to soil due to erosion and water that can be used for farming purposes.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<ul style="list-style-type: none"> <li>Replace topsoil during rehabilitation and ensure that the soil is well fertilised and rolled.</li> <li>Protect the land against soil erosion by following guidelines of the stormwater management plan.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<ul style="list-style-type: none"> <li>Sow seed of local plants that is adapted to the climate.</li> <li>Irrigate the soil to ensure germination and establishment of the seed occurs.</li> <li>Remove all alien plants and weeds until the natural plants are well established.</li> </ul>	LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA	NA	NA
<b>TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT</b>												
ESTABLISHMENT OF ALIEN PLANT SPECIES	<b>Direct impacts</b> Failure to rehabilitate and monitor the establishment of Alien Plant Species during the Construction (and Operation Phase) could lead to the further spread and infestation of Alien Plant Species during the Operational Phase.	DIRECT	STUDY AREA	LONG-TERM	POSSIBLE	SEVERE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>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.</li> <li>The ECO 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.</li> <li>An Alien Invasive Management Plan must be compiled and implemented during the Operational Phase.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Alien Plant Species such as <i>Acacia mearnsii</i> , <i>A. dealbata</i> , <i>Cirsium vulgare</i> , <i>Solanum spp.</i> , amongst others, have already established in the surrounding area. Therefore, should the operation of the proposed MNWP WEF and MNWP 2 WEF Grid Connection lead to the further establishment of alien invasive species in the project area, the invasion by alien species could be exacerbated.	CUMULATIVE	STUDY AREA	LONG-TERM	POSSIBLE	SEVERE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	HIGH (-)	<ul style="list-style-type: none"> <li>It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area.</li> <li>However, it is imperative that the applicant implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>No-go alternative</b> Alien Invasive Plant Species have already established within the project area. Under the no-go alternative these species are likely to continue multiplying if left unchecked. The current no-go alternative is therefore classified as High.	NO-GO	STUDY AREA	LONG-TERM	DEFINITE	SEVERE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	HIGH (-)	N/A	N/A
DISTURBANCE AND/OR DEATH OF FAUNAL SPECIES	<b>Direct impacts</b> During the operational phase, noise and light pollution associated with the operation and maintenance of the proposed development are likely to disturb faunal populations utilising the affected areas. WEFs release low frequency sound (or infrasound), inaudible by humans, but which can interrupt communication between larger mammal species. Additionally, operational activities such as vehicular movement and noise are likely to disturb faunal species and could result in the movement of faunal species away from the affected areas and/or the loss of faunal species. Slow-moving species such as tortoises and snakes are particularly susceptible to road kills. As such, this impact is rated moderate negative.	DIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>Regular maintenance and checks of the infrastructure must be undertaken.</li> <li>The mitigation measures specified in the Noise Impact Assessment conducted for MNWP WEF must be implemented and adhered to during the operational phase of the proposed development.</li> <li>External lighting should be avoided where possible. However, if required, lighting should be down lighting and low wattage.</li> <li>Minimise access to the site.</li> <li>All individuals must sign a register prior to accessing the proposed development site.</li> <li>Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Operational activities associated with the proposed development such as vehicular movement and noise are likely to increase the disturbance of faunal species caused by existing developments and activities within the project area. As such, this impact is rated moderate negative.	CUMULATIVE	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	MODERATE (-)	<ul style="list-style-type: none"> <li>It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area.</li> <li>However, it is imperative that the applicant implement the mitigation measures listed above for the direct impacts.</li> </ul>	LOW (-)
	<b>No-go alternative</b> Existing developments and activities will continue to disturb faunal species within the project area, even in the absence of the proposed development. The no-go alternative therefore is rated low negative.	NO-GO	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	MODERATE (-)	NA	NA
<b>AQUATIC IMPACT ASSESSMENT</b>												
	<b>Turbine and laydown areas</b>											
DIRECT ECOSYSTEM DESTRUCTION AND MODIFICATION IMPACTS	<b>Direct impacts</b> Accidental direct impacts to rivers and/or wetlands by heavy machinery during infrastructure repair and maintenance activities, particularly if ad-hoc laydown areas required.  Increased local and regional wetland bird fatalities as a result of turbine strikes.  <b>Note that this impact is not assessed as part of this assessment and will be assessed as part of the avifaunal impact assessment for the project.</b>	DIRECT	LOCALISED	LONG-TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE - LOW (-)	<b>Maintenance and management</b> <ul style="list-style-type: none"> <li>It is the applicant's responsibility to ensure the proper functioning of infrastructure that is likely to require regular on-going maintenance. This includes the stormwater management infrastructure and road infrastructure.</li> <li>It is important that the location and extent of the rivers and wetlands in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project.</li> <li>In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates the</li> </ul>	LOW (-)



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE - LOW (-)	landowner/developer to control IAPs on their property.	LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known construction activities are present on site.</p>	NO-GO	NO IMPACT							NA	<p><b>Monitoring</b> It will be important that long-term monitoring of the potential freshwater ecosystem impacts be undertaken to proactively to identify any environmental issues and impacts that may arise as a result of the operational phase of the project. The following key aspects should be monitored:</p> <ul style="list-style-type: none"> <li>▲ Erosion and/or sedimentation in the onsite and downstream wetlands;</li> <li>▲ Water table monitoring to determine any impacts to subsurface inputs; and</li> <li>▲ Presence of alien invasive plants.</li> </ul>	NA
INDIRECT HYDROLOGICAL AND GEOPHOMOLOGICAL IMPACTS	<p><b>Indirect impacts</b> Erosion and/or sedimentation of rivers and/or wetlands as a result of land surface hardening at turbine sites. Erosion and sedimentation impacts to wetlands include reduced wetland soil saturation due to flow concentration and/or vegetation burial. Erosion and sedimentation impacts to rivers include channel bank and bed modification and alteration in instream aquatic biotopes and riparian habitat.</p> <p>Reduced water inputs if activities cause additional soil piping and sinkholes that could intercept subsurface flows.</p>	INDIRECT	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	<p><b>Remediation / Rehabilitation</b> Where appreciable direct vegetation/habitat impacts and/or indirect erosion/sedimentation impacts or hydrological impacts occur resulting from project activities, these must be reported immediately to the relevant environmental authorities, and an independent aquatic or wetland specialist appointed to conduct a site inspection to assess the residual impacts and determine the need for any onsite remediation or rehabilitation requirements. Following this assessment, an implementable remediation and/or wetland rehabilitation plan may need to be compiled and implemented to the satisfaction of KZN EDTEA and DWS.</p>	MODERATE - LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	LONG TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
	<p><b>Direct impacts</b> Any erosion leading to sedimentation of rivers and wetlands onsite/downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality.</p> <p>Pollution of onsite and downstream rivers and onsite wetlands due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance activities (e.g. oil and diesel leaks).</p>	DIRECT	LOCALISED	LONG TERM	POSSIBLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	LOW (-)		LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	LONG TERM	POSSIBLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	<b>Direct impacts</b> Expanded / more intense edge impacts could occur as a result of deterioration in vegetation quality and cover and the potential for increased alien invasive plant invasion due to disturbance causing activities taking place near to wetlands and rivers.	DIRECT	LOCALISED	LONG TERM	PROBABLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	LONG TERM	PROBABLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA
	<b>Internal Access and Haulage Roads</b>											
DIRECT ECOSYSTEM DESTRUCTION AND MODIFICATION IMPACTS	<b>Direct impacts</b> Accidental direct impacts to rivers and/or wetlands by heavy machinery during infrastructure repair and maintenance activities, particularly culverts at crossings.	DIRECT	STUDY AREA	MEDIUM TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE - LOW (-)		MODERATE - LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	STUDY AREA	MEDIUM TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE - LOW (-)		MODERATE - LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
INDIRECT HYDROLOGICAL AND GEOMORPHOLOGICAL IMPACTS	<p><b>Indirect impacts</b> Erosion and/or sedimentation of rivers and/or wetlands as a result of poor stormwater management at access roads. Erosion and sedimentation impacts to wetlands include reduced wetland soil saturation due to flow concentration and/or vegetation burial. Erosion and sedimentation impacts to rivers include channel bank and bed modification and alteration in instream aquatic biotopes and riparian habitat.</p> <p>Reduced water inputs where poorly planned and aligned roads intercept subsurface water movement and preferential subsurface flows paths and/or if activities cause additional soil piping and sinkholes that could intercept subsurface flows.</p>	INDIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE – HIGH (-)		MODERATE - LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE – HIGH (-)		MODERATE - LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
WATER QUALITY IMPACTS	<p><b>Direct impacts</b> Any erosion leading to sedimentation of rivers and wetlands onsite/downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality.</p> <p>Pollution of onsite and downstream rivers and onsite wetlands due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance activities (e.g. oil and diesel leaks).</p>	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES		SIGNIFICANCE POST-MITIGATION
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	<p><b>Direct impacts</b> Decreased local ecological connectivity as a result of the operation of new or and upgraded road watercourse crossings. If poorly sited, aligned or designed across sensitive systems, the road could act as a barrier to aquatic and wetland fauna. In particular, poorly designed culverts across aquatic habitat could result in the formation of a barrier local aquatic fauna movement (macroinvertebrates, fish and frogs).</p> <p>Expanded / more intense edge impacts could occur as a result of deterioration in vegetation quality and cover and the potential for increased alien invasive plant invasion due to disturbance causing activities taking place near to rivers.</p>	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE (-)			MODERATE-LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE (-)			MODERATE-LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA			NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>AVIFAUNAL IMPACT ASSESSMENT</b>												
DIRECT HABITAT DESTRUCTION	<p><b>Direct impacts</b></p> <p>The grasslands present across the site are sensitive to imbalanced burn regimes and grazing pressures.</p> <p>Grasslands receive relatively high rainfall and habitats are sensitive to alterations of flow regimes and infiltration rates, with wetlands forming an important component for many avifaunal species in the area.</p> <p>Several potential risks to the long-term functioning and persistence of these environments exist which, if unmitigated, could result in the long-term degradation or permanent loss of habitats.</p> <p>Fortunately, the potential risks are relatively easy to mitigate very effectively and are largely standard practice for these types of developments.</p> <p>In addition, downstream environments are largely degraded due to alien plant invasion.</p> <p>Increased runoff from hard surfaces during the operational phase (e.g. pylon bases, roads etc.) has the potential to increase the risk of habitat destruction through erosion, which can alter flow regimes and water tables, drain wetland environments or increase sedimentation downstream.</p> <p>These potential impacts are also easy to mitigate through the appropriate use of flow and erosion control measures.</p>	DIRECT	STUDY AREA	LONG TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	MODERATE (-)	<p><b>Direct habitat destruction</b></p> <ul style="list-style-type: none"> <li>Flow- and erosion control measures must be implemented where appropriate to reduce uncontrolled runoff from hard surfaces.</li> <li>Infrastructure must be designed in a manner that is compatible with the continuation of burn regimes implemented in the surrounding grasslands.</li> <li>No open fires are to be permitted outside of designated areas.</li> <li>The operational EMP must be developed and implemented and should include site specific measures for the effective management and treatment of any wastewater to be produced by the project.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<p><b>Cumulative</b></p> <ul style="list-style-type: none"> <li>All appropriate mitigation measures listed above should be implemented;</li> <li>The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues;</li> <li>A data sharing agreement should be setup with other wind farm projects in the region to share operational monitoring data. Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management; and</li> <li>Implement an alien woody plant removal and eradication programme to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NO IMPACT						NA	NA	NA	
DISTURBANCE AND DISPLACEMENT	<p><b>Direct impacts</b> Indirect loss of habitat from disturbance during the operational phase is associated with ongoing operational activity as well as more discrete periods of routine maintenance tasks.</p> <p>Similar to the construction phase, the avifauna in the area already experience levels of disturbance associated with agricultural activities and therefore species particularly sensitive to disturbance are unlikely to frequent the area.</p>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<p><b>Disturbance and displacement</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>All contractors are to adhere to the EMPr and must apply good environmental practice during all operations.</li> <li>Operational phase bird monitoring, in line with the latest available guidelines, must be implemented.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<p><b>Cumulative</b></p> <ul style="list-style-type: none"> <li>All appropriate mitigation measures listed above should be implemented.</li> <li>The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues.</li> <li>A data sharing agreement should be setup with other wind farm projects in the region to share operational monitoring data. Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</li> <li>Implement an alien woody plant removal and eradication programme to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NO IMPACT						NA	NA	NA	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<p><b>DIRECT MORTALITY – COLLISION WITH INFRASTRUCTURE</b></p>	<p><b>Direct impacts</b> WEFs can cause bird fatalities through the collision of birds with moving turbine blades.</p> <p>The most effective mitigation for collision impacts currently available is wind farm placement, as well as specific turbine placement within a WEF to avoid elevated avifaunal SCC use areas.</p> <p>Collisions with power lines are a well-documented threat to birds in southern Africa. Heavy bodied birds such as bustards, cranes and waterbirds, with limited manoeuvrability, are more susceptible to this impact.</p>	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	<p><b>MODERATE (-)</b></p>	<ul style="list-style-type: none"> <li>▶ WTGs must not be constructed within any designated Very High Sensitivity (WTG no-go) areas.</li> <li>▶ Additional mitigation (as detailed below) must be implemented for WTGs placed within High and Medium sensitivity areas.</li> <li>▶ Shut down-on-demand and 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.</li> <li>▶ Internal power lines must be buried wherever technically feasible.</li> <li>▶ Appropriate (approved) Bird Flight Diverters (BFDs) must be affixed to the entire length of novel overhead power lines (in all sensitivity categories).</li> <li>▶ 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.</li> <li>▶ If double layers of fencing are required for security purposes, they should be positioned at least 2m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences.</li> <li>▶ Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines.</li> <li>▶ Regular reviews of operational phase monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist.</li> <li>▶ The above reviews should strive to identify sensitive locations including WTGs and areas of increased collisions that may require additional mitigation.</li> <li>▶ An operational monitoring programme for any novel overhead power lines must be implemented to locate potential collision fatalities.</li> <li>▶ Any fatalities located must be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT).</li> </ul>	<p><b>LOW (-)</b></p>

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>All appropriate mitigation measures listed above should be implemented.</li> <li>The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues.</li> <li>A data sharing agreement should be setup with other wind farm projects in the region to share operational monitoring data. Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</li> <li>Implement an alien woody plant removal and eradication programme to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA
DIRECT MORTALITY – ELECTROCUTION	<p><b>Direct impacts</b> 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>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>Internal power lines should be buried wherever possible.</li> <li>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.</li> <li>An operational monitoring programme for the overhead power line route must be implemented to locate potential collision fatalities.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>All appropriate mitigation measures listed above should be implemented.</li> <li>The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues.</li> <li>A data sharing agreement should be setup with other wind farm projects in the region to share operational monitoring data. Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</li> <li>Implement an alien woody plant removal and eradication programme to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NI IMPACT							NA	NA	NA



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>BAT IMPACT ASSESSMENT</b>												
<b>MORTALITY DUE TO WIND TURBINE COLLISION AND/OR BAROTRAUMA</b>	<p><b>Direct impacts</b></p> <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 in 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.</p> <p>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	STUDY AREA	LONG TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>✦ Implement blade feathering (up to the manufacturers cut-in speed) as soon as operation begins, to prevent freewheeling.</li> <li>✦ The placement of all turbines, as well as their full blade length, should avoid high sensitivity areas.</li> <li>✦ The placement of all turbines, as well as their full blade length, should avoid medium sensitivity areas, as far as possible. However, if unavoidable, then the associated features should be removed prior to turbines becoming operational. Should these features not be removed, then strict minimisation techniques (i.e. turbine curtailment and/or acoustic deterrence mechanisms) are to be implemented as soon as the first turbine starts spinning.</li> <li>✦ If residual impacts reach the threshold limit (at any wind turbine), then appropriate minimisation measures are to be implemented (turbine curtailment and/or acoustic deterrence mechanisms).</li> <li>✦ 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.</li> <li>✦ This includes downward facing low pressure sodium and warm white LED lights.</li> </ul>	MODERATE (-)
	<p><b>Cumulative impacts - Bat Fatality</b></p> <p>Multiple wind farms 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.</p> <p>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 3 onshore solar PV facilities are being considered according to the DFFE Renewable Energy database (Q3 2022), within a 50 km region of the proposed MNWP WEF.</p>	CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>✦ All mitigation measures, as listed above, are to be strictly adhered to, to reduce the probability of significant mortality impacts occurring at MNWP WEF, and subsequently on a cumulative scale as well. This will be relevant for the MNWP WEF, as well as all surrounding WEF's. Fatalities should be considered across all WEF's as far as possible, and transparency / data sharing of operational results is recommended to further consider cumulative impacts.</li> </ul>	MODERATE (-)
	<p><b>No-go alternative</b></p> <p>The no-go alternative would result in no further impacts on bats or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DISTURBANCE/ DISPLACEMENT	<p><b>Direct impacts</b> Wind Farms have the potential to impact bats indirectly during the operational phase through the disturbance of roosts or when conducting activities during hours of important bat foraging activities. Relevant activities include the construction of roads, Operation and Maintenance (O&amp;M) buildings, sub-station(s), internal transmission lines and the installation of wind turbines.</p> <p>Excessive noise and dust during the operational phase could result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.</p>	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>Limit operational/maintenance activities to daylight hours.</li> <li>Avoid all operational/maintenance activities for wind turbines and associated infrastructures within potential bat roosting habitats.</li> <li>Although no confirmed bat roosts have been identified on site to date, it is recommended that a suitably qualified bat specialist (appointed to conduct the operational phase bat monitoring programme) is to further advise on refining these recommendations as new information becomes available, during the project's operational phase.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on bats or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA
<b>HERITAGE IMPACT ASSESSMENT</b>												
	NONE											
<b>PALAEONTOLOGICAL IMPACT ASSESSMENT</b>												
	NONE											
<b>NOISE IMPACT ASSESSMENT</b>												
OPERATION OF MULILO NEWCASTLE WIND POWER WEF (WORST-CASE SPL)	<p><b>Direct impacts</b> Noise levels generated by operating WTG (using maximum worst-case SPL).</p> <p>Operational noise levels should not change the existing ambient sound levels with more than 7 dB (which could be as much as 48.5 dBA), nor should operating activities result in noise levels exceeding the 45 dBA.</p>	DIRECT	STUDY AREA	LONG TERM	PROBABLE (HIGHLY LIKELY FOR NSR 08 & 40)	SEVERE (HIGH ON NSR 08, 09, 22 & 40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	MEDIUM (-)	<ul style="list-style-type: none"> <li>The applicant should get written confirmation from NSR08 and 40 that the dwelling(s) will not be used for residential purposes in the future.</li> <li>For the layout as evaluated, the applicant can select a WTG with a SPL less than 108 dBA (as per the IEC 61400-14 certificate) to reduce noise levels at NSR 09 and 22.</li> <li>The Applicant can reduce the total number of WTG located within 2,000m from NSR08 and 40.</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative noises from numerous WTG of various WEFs operating simultaneously. Total cumulative noise levels should not exceed 45 dBA.	CUMULATIVE	STUDY AREA	LONG TERM	DEFINITE (DEFINITE ON NSR40) PROBABLE (LIKELY ON NSR22, 38 AND 40)	VERY SEVERE (VERY HIGH ON NSR40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>The applicant should get written confirmation from NSR08 &amp; 40 that the dwelling(s) will not be used for residential purposes in the future; or</li> <li>The applicant can change the layout to reduce the number of WTG located within 2,000m from NSR08 &amp; 40 (in co-operation with Mulilo Newcastle Wind Power 2 WEF).</li> <li>For the layout as evaluated, the applicant can select a WTG with a SPL less than 108 dBA (as per the IEC 61400-14 certificate).</li> </ul>	LOW (-)
	<b>No-go alternative</b> The no-go alternative would result in no further noise impacts.	NO-GO	NO IMPACT							NA	NA	NA
OPERATION OF MULILO NEWCASTLE WIND POWER WEF (REPORTED SPL)	<b>Direct impacts</b> Noise levels generated by operating WTG (using the reported noise level). Operational noise levels should not change the existing ambient sound levels with more than 7 dB (which could be as much as 48.5 dBA), nor should operating activities result in noise levels exceeding the 45 dBA.	DIRECT	STUDY AREA	LONG TERM	PROBABLE (LIKELY FOR NSR 08 & 40)	MODERATELY SEVERE/MODERATE	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	MEDIUM (-)	<ul style="list-style-type: none"> <li>The applicant should get written confirmation from NSR08 and 40 that the dwelling(s) will not be used for residential purposes in the future.</li> <li>The Applicant can reduce the total number of WTG located within 2,000m from NSR08 &amp; 40.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Cumulative noises from numerous WTG of various WEFs operating simultaneously. Total cumulative noise levels should not exceed 45 dBA.	CUMULATIVE	STUDY AREA	LONG TERM	DEFINITE (DEFINITE ON NSR40)	SEVERE (HIGH ON NSR40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>The applicant should get written confirmation from NSR08 &amp; 40 that the dwelling(s) will not be used for residential purposes in the future.</li> <li>The applicant can change the layout to reduce the number of WTG located within 2,000m from NSR08 &amp; 40 (in co-operation with MNWP 2 WEF).</li> <li>For the layout as evaluated, the applicant can select a WTG with a SPL less than 108 dBA (as per the IEC 61400-14 certificate).</li> </ul>	LOW (-)
	<b>No-go alternative</b> The no-go alternative would result in no further noise impacts.	NO-GO	NO IMPACT							NA	NA	NA

**SOCIO-ECONOMIC IMPACT ASSESSMENT**

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
NEW EMPLOYMENT AND ECONOMIC IMPACTS	<p><b>Direct impacts</b> Direct and indirect employment opportunities will manifest during the operational lifespan of the Project and result in an increase in household earnings and improved livelihoods through salaries and wages.</p> <p>Economic impacts will occur for the local and national economies through the manufacturing and services industries. Induced economic impacts will realize through employment and procurement and as a result more benefits for retail sales, leisure and hospitality, real estate, etc. will occur as more money flows in the local economy.</p> <p>Furthermore, agricultural land will be rezoned for renewable energy purposes, thereby increasing farm values and resulting in higher payable taxes for the local municipality.</p>	DIRECT, INDIRECT	REGIONAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	MODERATE (+)	<p>Enhance benefits:</p> <ul style="list-style-type: none"> <li>▲ Maximise local employment and procurement (from the local and district municipalities) wherever possible.</li> <li>▲ Coordinate the effort to obtain temporary employment, service providers, SMME's etc. required for maintenance work, with the municipal LED Unit.</li> <li>▲ Assist and guide the local community with regards to the needs of the WEF plant and the types of supporting industries and services required for its successful operation. If feasible, make ED funding available to assist the existing municipal initiatives with skills training and capacity building of SMME's.</li> <li>▲ Make employment creation one of the SED program's targets, aims and objectives. Local businesses that apply for SED funding have to demonstrate their commitment to employment creation (criteria for evaluation by the Implementing and Monitoring Agent).</li> </ul>	MODERATE (+)
	<p><b>Cumulative economic impacts</b> As a result of construction, maintenance and repairs, as well as skills development and capacity building, the construction and operational phases will result in positive cumulative economic impacts nationally and locally in terms of:</p> <ul style="list-style-type: none"> <li>▲ Permanent, temporary and indirect employment creation;</li> <li>▲ Creation of new business opportunities locally and nationally, as well as further downstream opportunities through indirect and induced impacts especially with regards to the manufacturing and service industries; and</li> <li>▲ Improvement of livelihoods of benefitting households that result in increasing spending power, with spin-off effects on local and regional businesses such as retail, leisure, real estate and so forth.</li> </ul>	CUMULATIVE	NATIONAL	LONG-TERM	DEFINITE	SEVERE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	HIGH (+)	No mitigation is required.	HIGH (+)
	<p><b>Cumulative social impacts</b> Long-term negative social impacts that remain once a workforce leave an area are evident in provinces such as the Northern and Western Cape, where large-scale RE projects are already operational. Long-term issues - which usually become the local municipalities' responsibility - include unusual population growth rates coupled with an increase in the unemployed, social issues (increase in HIV/AIDS, unwanted pregnancies and absent fathers) culminating in pressure on local government services (health care, infrastructure services and housing provision).</p>	DIRECT, INDIRECT	REGIONAL	LONG-TERM	POSSIBLE	MODERATE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▲ Maximise local employment.</li> <li>▲ Implement all the mitigation measures as proposed in Section 7.7 of the SEIA.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> New employment, direct and induced economic impacts will not manifest local nor nationally.</p>	NO-GO	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	N/A	MODERATE (-)	▲

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
IMPACTS ON LIVELIHOODS OF DIRECTLY BENEFITTING LANDOWNERS	<b>Direct impacts</b> During the operational period the IPP will sign a long-term lease agreement with the affected landowners where turbines and associate infrastructure are located, thereby compensating them through an annual fee. Details of the option-to-lease agreements are confidential. However, the compensation will increase the landowners' incomes and revenue and can be used to further invest in their properties, increase productivity and employment, or improve financial security.	DIRECT	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	VERY DIFFICULT	LOW (+)	Minimize/reduce impact: ▲ Consider the potential increase in rates and taxes during the negotiation processes with landowners.	LOW (+)
	<b>Cumulative impacts</b> The number of households benefitting during the operational phase as a result of incomes earned through lease agreements, will increase to approximately 8 (based on 74 turbine localities).	DIRECT	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	LOW (+)	No mitigation is required.	LOW (+)
	<b>No-go alternative</b> No incomes and subsequent improvement of livelihoods for landowners through lease agreements.	NO-GO	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	N/A	LOW (-)	▲ NA
SOCIO-ECONOMIC CONTRIBUTION / COMMUNITY DEVELOPMENT	Approximately 2.1% of revenue is allocated towards the implementation of SED and ED projects. Spending of funds are monitored through the Independent Power Producer Office (IPPO).	DIRECT	REGIONAL	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	LOW (+)	Enhance benefits: ▲ Involve the local and district municipalities' LED Units in all processes when SED and ED projects and suitable candidates for projects and/or training programmes are identified. ▲ Join the existing Newcastle LED Forum and align projects with the goals and objectives identified for the region's trade and industry sectors. ▲ Make gender and Youth issues a specific outcome of the needs analysis to ensure that these groups are targeted. ▲ Ensure further transparency and effective information sharing through industry associated websites, emailed newsletters, municipal noticeboards, information events and meetings and existing community channels used by the various wards. ▲ Become involved in local initiatives that address existing backlogs to ensure that real community based needs are met.	MODERATE (+)
	<b>No-go alternative</b> No community and infrastructure projects that would contribute to job creation and community development.	DIRECT	REGIONAL	LONG-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	N/A	LOW (-)	NA





ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
IMPACTS ON TOURISM / ACCOMMODATION FACILITIES / PROTECTED AREAS	<p><b>Indirect impacts</b> Draaiwater Lodge, Drakensbergkloof, Grey Goose Game Farm, Newcastle Country Lodge and Sneeuwberg PE would be particularly vulnerable to potential negative visual impacts.</p> <p>However, other factors than visual exposure would also impact tourism, such as local conditions, markets, location, technologies, size of the facility and the receiving environment (communities, tourist activities, landscape, etc.).</p> <p>The impact on tourism as a result of wind farm developments is not easily measured and international and local research are inconclusive about the topic.</p>	INDIRECT	MUNICIPAL	LONG-TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	DIFFICULT	LOW (-)	Avoid/prevent impact: <ul style="list-style-type: none"> <li>Based on the Specialist VIA findings, consult with individual tourism establishments that would experience a high or very high visual impact and/or who are concerned that revenues will be affected. Consider eliminating specific turbines from the development if feasible.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Even though it is possible that visual exposure and impacts on the landscape character could increase for some of the tourism establishments and Protected Areas, the consequence of the cumulative impact on tourism would not increase to such a degree that the overall significance would change.</p>	INDIRECT	MUNICIPAL	LONG-TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	LOW -	No mitigation is proposed.	LOW -
	<p><b>No-go alternative</b> Existing tourism market and tourism status quo would continue.</p>	N/A	MUNICIPAL	LONG-TERM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA
IMPACTS ON LAND VALUES	<p><b>Direct impacts</b> Impacts of wind farms on land values is an indecisive matter. However, based on local and international research and the SEIA Specialist's consultation with estate agents and other experts, it is the professional opinion of the SEIA Consultant that negative impacts on land values during the operational phase of the MNWP facility are unlikely, and property prices might even increase for the duration of operations. It is however possible that individual negative perceptions towards the infrastructure may affect property sales negatively in terms of possible prolonged sale periods and fewer buyers' interests.</p>	INDIRECT	STUDY AREA	LONG-TERM	UNSURE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	VERY DIFFICULT	LOW (-)	No mitigation is proposed.	LOW (-)
	<p><b>Cumulative impacts</b> It is possible that negative cumulative impacts on land values could manifest for individual properties. However, the assessment of the cumulative impact on farmland values are inconclusive as there are too many variables that could affect the impact, whether positive or negative, and no rating is provided.</p>	INDIRECT	STUDY AREA	LONG-TERM	POSSIBLE	N/A	REVERSIBLE	RESOURCE WILL NOT BE LOST	N/A	N/A		N/A
	<p><b>No-go alternative</b> No impacts on land values and the status quo continues.</p>	NO-GO	NO IMPACTS							N/A	N/A	N/A

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
INTRUSION IMPACTS	<p><b>Direct and indirect impacts</b></p> <p>Intrusion impacts during operations refer to nuisance issues experienced with regard to an increase in traffic (limited) and movement of maintenance personnel, noise and visual / aesthetic / light impacts due to the presence of turbines and night-time shadow flicker.</p> <p>Indirect impacts on agricultural land uses are possible, including:</p> <ul style="list-style-type: none"> <li>▲ Gates that are left open or not locked resulting in animals that go missing and/or mix with animals in different breeding groups / cycles;</li> <li>▲ Livestock that is killed on access roads if wind farm vehicles speed and disobey traffic rules;</li> <li>▲ A potential increase in stock theft and illegal poaching;</li> <li>▲ Potential veld fires that damage farmland and farm infrastructure; and</li> <li>▲ Insufficient biosecurity measures / screening of workers (biological risks), potentially introducing diseases to livestock breeding farms.</li> </ul>	DIRECT, INDIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▲ Implement an effective Land Use Management programme (procedures when gates are opened and closed, road maintenance, implementation of methods to address potential veld fires, no-go areas, etc.) in collaboration with the landowners.</li> <li>▲ Implement all mitigation and management measures as proposed by the VIA and NIA Specialists.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>Since impacts associated with traffic, noise, air / dust pollution and shadow flicker are usually mitigated satisfactorily for wind farm projects, the assumption is drawn that mitigation will also be done sufficiently for the Mulilo Newcastle WEF Complex. Visual impacts can, however, not be mitigated easily and it is thus probable that that negative cumulative visual impacts will be high.</p>	DIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	MODERATE (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▲ Implement an effective Land Use Management programme (procedures when gates are opened and closed, road maintenance, implementation of methods to address potential veld fires, no-go areas, etc.) in collaboration with the landowners.</li> <li>▲ Implement all mitigation and management measures as proposed by the VIA and NIA Specialists.</li> </ul>	MODERATE (-)
	<p><b>No-go alternative</b></p> <p>No negative intrusion impacts will manifest for landowners.</p>	NO-GO	NO IMPACTS							N/A	N/A	N/A
IMPACTS ON SENSE OF PLACE	<p><b>Direct and indirect impacts</b></p> <p>The social impact associated with the long-term impact on the sense of place relate to a change in the landscape character, intrusion impacts and potential changes to the safety and security and social surroundings that landowners and community members currently experience.</p>	DIRECT, INDIRECT	STUDY AREA	LONG-TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	HIGH (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▲ Implement all relevant mitigation measures as proposed to reduce intrusion impacts.</li> <li>▲ Implement all measures as proposed in the VIA and NIA Reports.</li> <li>▲ As far as possible, avoid turbines to be located in direct view of residences and / tourist and holiday accommodation establishments.</li> <li>▲ Implement measures to increase communication and transparency between the land owners and Project as proposed in the previous sections of this report.</li> </ul>	MODERATE (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> The cumulative impact on sense of place would be associated with changes in the landscape character as a result of visual impacts of the Mulilo Newcastle WEF Complex, as well as negative intrusion impacts that changes the community's perception of their living environment. Landowners could also easily attribute an increase in stock theft and crime levels to these collective developments due to the inflow of people and poor land use management practices, which could further result in negative effects on the current sense of place they experience.	DIRECT, INDIRECT	STUDY AREA	LONG-TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	HIGH (-)	Minimize/reduce impact: <ul style="list-style-type: none"> <li>Implement all relevant measures to reduce intrusion impacts and as proposed in the Specialist NIA and VIA reports.</li> <li>As far as possible, avoid turbines to be located in direct view of residences and / or tourist and holiday accommodation establishments.</li> </ul> Implement measures to increase communication and transparency between the land owners and IPP, as proposed in the previous sections of this report.	HIGH (-)
	<b>No-go alternative</b> Status quo remains. No impact on sense of place occurs for community members and landowners.	NO-GO	NO IMPACTS							N/A	N/A	N/A
CONTRIBUTION TO NATIONAL POWER SUPPLY	<b>Direct and indirect impacts</b> The proposed MNWP facility will generate up to 200MW electricity and enhance the reliability and stability of supply that would contribute to economic development in the country as a whole.	DIRECT, INDIRECT	NATIONAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	N/A	MODERATE (+)	<ul style="list-style-type: none"> <li>No mitigation required.</li> </ul>	MODERATE (+)
	<b>Cumulative impacts</b> Positive cumulative impacts will manifest for national power supply as well as economic development, as the energy output of the two facilities combined will increase to up to 400MW.	DIRECT, INDIRECT	NATIONAL	LONG-TERM	DEFINITE	BENEFICIAL	REVERSIBLE	RESOURCE WILL NOT BE LOST	VERY DIFFICULT	HIGH (+)	<ul style="list-style-type: none"> <li>No mitigation is required.</li> </ul>	HIGH (+)
	<b>No-go alternative</b> No contribution to national power supply and economic benefits related thereto do not occur.	DIRECT, INDIRECT	NATIONAL	LONG-TERM	DEFINITE	MODERATE	N/A	N/A	N/A	MODERATE (-)	NA	N/A
<b>VISUAL IMPACT ASSESSMENT</b>												
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	<b>Direct impacts</b> The visual impacts of facility operations on sensitive visual receptors (i.e. residents of farm and homestead, as well as observers travelling along the R34) in close proximity to the proposed MNWP - Northern WEF. (i.e. within 5km) is expected to be of very high significance. No mitigation is possible for a facility of this scale, but measures have been included as best practice guidelines.	DIRECT	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	VERY HIGH (-)	<ul style="list-style-type: none"> <li>Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.</li> <li>Maintain the general appearance of the facility as a whole.</li> <li>Monitor rehabilitated areas, and implement remedial action as and when required.</li> </ul>	VEVERY HIGH (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.	CUMULATIVE	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	VERY HIGH (-)		VERY HIGH (-)
	<b>No-go alternative</b> Status quo remains with no additional visual impacts.	NO-GO	NO IMPACTS							NA	NA	NA
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE REGION	<b>Direct impacts</b> The visual impact of facility operations on sensitive visual receptors (i.e. users of the R34 and other secondary roads, residents of farm and homesteads and visitors to sections of the Sneeuwberg Protected Environment) within the region (i.e. beyond the 5km offset) is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines.	DIRECT	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<b>Site development &amp; Operation:</b> <ul style="list-style-type: none"> <li>Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.</li> <li>Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.</li> <li>Dust suppression techniques should be in place at all times during the site development and operational phases.</li> </ul>	HIGH (-)
	<b>Cumulative impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.	CUMULATIVE	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<ul style="list-style-type: none"> <li>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.</li> <li>Downscaling of operations.</li> <li>Keeping infrastructure at minimum heights.</li> <li>Introducing landscaping measures such as vegetating berms.</li> <li>Avoid the use of highly reflective material.</li> <li>Metal surfaces, where they occur, should be painted in natural soft colours that would blend in with the environment.</li> <li>Maintain the general appearance of the site as a whole.</li> </ul> <b>Lighting</b> <ul style="list-style-type: none"> <li>Lighting should be kept to a minimum wherever possible.</li> <li>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.</li> <li>Wherever possible, lights should be directed downwards to avoid illuminating the sky.</li> <li>Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.</li> </ul>	HIGH (-)
	<b>No-go alternative</b> Status quo remains with no additional visual impacts.	NO-GO	NO IMPACTS							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION</b>	<b>Direct impacts</b> 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.  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 impact 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.  Lastly 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.	DIRECT	LOCAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	DIFFICULT	HIGH (-)	<b>Planning &amp; operation:</b> <ul style="list-style-type: none"> <li>✦ Aviation standards and CAA Regulations for turbine lighting must be followed.</li> <li>✦ 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.</li> <li>✦ Install aircraft warning lights that only activate when the presence of an aircraft is detected, if permitted by CAA.</li> <li>✦ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).</li> <li>✦ Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.</li> <li>✦ Make use of minimum lumen or wattage in fixtures.</li> <li>✦ Make use of down-lighters, or shielded fixtures.</li> <li>✦ Make use of Low-Pressure Sodium lighting or other types of low impact lighting.</li> <li>✦ 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.</li> </ul>	MODERATE (-)
	<b>Cumulative impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines) 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.	CUMULATIVE	LOCAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	DIFFICULT	HIGH (-)		MODERATE (-)
	<b>No-go alternative</b> Status quo remains with no additional visual impacts.	NO-GO	NO IMPACTS							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	<p><b>Direct impacts</b> 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 1 Km buffer along the edge of the outer most turbines is identified as the zone within which there is a risk of shadow flicker occurring.</p> <p>A few homesteads and a small portion of the R34 are located within the 1 Km buffer, however it is expected that the shadow flicker experienced by motorist traveling along roads will be fleeting and not constitute a shadow flicker visual impact of concern. Additionally, it can be expected that shadow flicker will be experienced by sensitive receptors who are predominately located on the southern half of the potential flicker zones, namely to the west, south west, south, south east and east following the traction of the sun from east to west. In this regard, any homesteads located to the north would lower the probability of this impact occurring. The significance of shadow flicker is therefore anticipated to be High.</p>	DIRECT	LOCAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	NO	DIFFICULT	HIGH (-)	No mitigation measures proposed.	MODERATE (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	NO IMPACTS							NA	No mitigation measures proposed.	NA
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACTS							NA	NA	NA
ANCILLARY INFRASTRUCTURE	<p><b>Direct impacts</b> On-site ancillary infrastructure associated with the Mulilo Newcastle Wind Power- Northern WEF includes a 33/132kV collector substation, underground 33kV cabling between the wind turbines, internal access roads and operations and maintenance buildings. 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.</p> <p>The anticipated visual impact resulting from this infrastructure is likely to be of moderate significance both before and after mitigation.</p>	DIRECT	LOCAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	NO	DIFFICULT	MODERATE (-)	No mitigation measures proposed.	MODERATE (-)



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	NO IMPACTS							NA	No mitigation measures proposed.	NA
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACTS							NA	NA	NA
<p><b>POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION</b></p>	<p><b>Direct impacts</b> 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.</p> <p>A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the 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 undeveloped and natural in character. The visual quality of the region is generally high and large tracts of intact vegetation characterise most of the visual environment, as well as, the scenic mountains and ridges. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation.</p> <p>The anticipated visual impact on the visual character and sense of place of the study area is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.</p>	DIRECT	REGIONAL	LONG-TERM	DEFINITE	HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<p><b>Planning:</b></p> <ul style="list-style-type: none"> <li>Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.</li> <li>Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised.</li> <li>Use existing roads wherever possible. Where new roads are 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.</li> </ul> <p><b>Construction:</b></p> <ul style="list-style-type: none"> <li>Rehabilitate all construction areas.</li> <li>Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.</li> </ul> <p><b>Operations:</b></p> <ul style="list-style-type: none"> <li>Maintain the general appearance of the facility as a whole.</li> <li>Monitor rehabilitated areas, and implement remedial action as and when required.</li> </ul> <p><b>Decommissioning:</b></p> <ul style="list-style-type: none"> <li>Remove infrastructure not required for the post-decommissioning use of the site.</li> <li>Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.</li> <li>Monitor rehabilitated areas post-decommissioning and implement remedial actions.</li> </ul>	HIGH (-)
	<p><b>Cumulative impacts:</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.</p>	CUMULATIVE	REGIONAL	LONG-TERM	DEFINITE	HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<ul style="list-style-type: none"> <li>Monitor rehabilitated areas post-decommissioning and implement remedial actions.</li> </ul>	HIGH (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACTS						NA	NA	NA	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON PROTECTED/ CONSERVATION AREAS WITHIN THE REGION.	<p><b>Direct impacts</b> The greater region is generally seen as having a high scenic value and tourism value potential to a certain extent owing to the presence of a number of protected areas (Sneeuwberg Protected Environment, Seekoeivlei Nature Reserve, Potberg Private Nature Reserve and Ncandu Nature Reserve). The landscape is characterised by undulating hills with a high visual quality and strong sense of place. This study area is not known as a tourist destination, but Newcastle is an alternate route for travellers from Gauteng to Durban. Additionally, Newcastle is part of the KZN Battlefields Route where the Majuba Mountain has historical significance.</p> <p>The anticipated visual impact of the proposed MNWP (Northern) WEF on protected/conservation areas within the region is therefore expected to be of moderate significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.</p>	DIRECT	REGIONAL	LONG-TERM	HIGHLY PROBABLE	MODERATE	REVERSIBLE	NO	VERY DIFFICULT	MODERATE (-)	As above	MODERATE (-)
	<p><b>Cumulative impacts:</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.</p>	CUMULATIVE	REGIONAL	LONG-TERM	HIGHLY PROBABLE	MODERATE	REVERSIBLE	NO	VERY DIFFICULT	MODERATE (-)	As above	MODERATE (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACTS						NA	NA	NA	
POTENTIAL CUMULATIVE VISUAL IMPACT OF WIND ENERGY FACILITIES WITHIN THE REGION	<p><b>Direct impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF may increase the cumulative visual impact of industrial type infrastructure within the region.</p> <p>The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. Visual impacts are likely to be of high significance.</p>	DIRECT	REGIONAL	LONG-TERM	HIGHLY PROBABLE	MODERATE	REVERSIBLE	NO	VERY DIFFICULT	MODERATE (-)	NA	HIGH (-)
	<p><b>Cumulative impacts:</b> NA</p>	CUMULATIVE	NO IMPACTS						NA	NA	NA	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	
													NO IMPACTS
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO									NA	NA	NA
<b>TRAFFIC IMPACT ASSESSMENT</b>													
<b>TRAFFIC CONFLICT AND CONGESTION DURING CONSTRUCTION OF THE WEF</b>	The Traffic Feasibility Assessment considered the following main traffic impacts related to the following aspects: <ul style="list-style-type: none"> <li>▲ Existing operating conditions;</li> <li>▲ Traffic volumes;</li> <li>▲ Internal traffic circulation and parking;</li> <li>▲ Access proposals;</li> <li>▲ Road improvements;</li> <li>▲ Building lines; and</li> <li>▲ Abnormal loads.</li> </ul>	DIRECT	REGIONAL	SHORT-TERM	PROBABLE	MODERATE	REVERSIBLE	NO	ACIEVABLE	MODERATE (-)	<p><b>Traffic and Transportation Management Plan</b></p> <ul style="list-style-type: none"> <li>• The Traffic and Transportation Management Plan provided in the TIA must be followed and implemented during the construction phase of the WEF.</li> </ul> <p><b>Building lines</b></p> <ul style="list-style-type: none"> <li>• All other structures shall be erected at least 60m from a national or provincial road reserve fence and 500m from an intersection.</li> </ul> <p><b>R34/Access Road intersection</b></p> <ul style="list-style-type: none"> <li>• There must be no vehicular accesses permitted onto the R34 other than at the proposed/existing access. It is therefore recommended that a suitable barrier be erected to prohibit such access. In this regard, the current fence serves such purpose.</li> <li>• Vegetation should be cleared (in the form of cutting the long grass) on the two southern corners of the R34 access intersection.</li> </ul> <p><b>Abnormal load vehicles</b></p> <ul style="list-style-type: none"> <li>• During the construction stage the abnormal load vehicles expected at the site will require the bell mouth of the R34/Access Road intersection to be increased to accommodate the large turning radius of these vehicles. The extent of the widening must be determined at the detailed design stage.</li> </ul> <p><b>Internal roads</b></p> <ul style="list-style-type: none"> <li>• The internal gravel roadways should be designed in accordance with the Guidelines for Human Settlement Planning and Design ("The Redbook"). Geometric designs of the roads should ensure that the requirements of all types of vehicles expected to visit the site are met, i.e. minimum turning radii, roadway widths, etc. The pavement design, where necessary, will form part of the detailed design stage.</li> </ul> <p><b>General traffic and transportation</b></p> <ul style="list-style-type: none"> <li>• All road works must comply with the SARTSM, Chapter 13 and Volume 2.</li> <li>• Temporary traffic control zone signs must be adequate in order to convey both general and specific messages to the road users.</li> <li>• Adequate signage must be placed on the roads, such as: speed limits, caution: electrical road works in progress, use of alternative roads, stop/go signs, flagman ahead, etc.</li> </ul>	LOW (-)	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
											<p><b>Transporting of construction staff</b></p> <ul style="list-style-type: none"> <li>Company transport must be in the form of appropriate transportation vehicle/s. No persons must be transported in the back of a bakkie.</li> </ul> <p><b>Site access control</b></p> <ul style="list-style-type: none"> <li>Access control must be managed at the gate to ensure that no authorized person enters the site unless a valid access card is presented at the gate to the security guards.</li> <li>Control at pick-up locations prior to entering the transportation vehicle/s, must ensure that no unauthorized person enters the site.</li> <li>All persons must be inducted before entering the gate and proof of induction must be kept for inspection purposes.</li> <li>Upon entering the site all persons must undergo alcohol testing.</li> <li>All vehicles entering the site must have a beacon light and a whip and flag to ensure that these vehicles are visible.</li> <li>Necessary signage must be placed where needed and only vehicles designated as construction vehicles will be allowed to travel on the main roads.</li> <li>No private vehicles should be allowed to travel on the main roads. Those travelling with private vehicles should be escorted to the site with their vehicles and from there escorted in designated construction vehicles.</li> </ul> <p><b>Parking areas</b></p> <ul style="list-style-type: none"> <li>Designated parking areas must be identified on site where vehicles will park during the day.</li> <li>A designated walkway should also be created which should be barricaded, whereby workers can walk to access their work areas.</li> </ul>	

# OPERATIONAL PHASE

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>AGRICULTURAL IMPACT ASSESSMENT</b>												
LOSS OF HIGH CULTIVATED OR HIGH POTENTIAL AGRICULTURAL LAND	<b>Direct impacts</b> There is no high potential or unique land or land that is irrigated on or in proximity of available surface water. No high potential or unique land will be lost.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	▲ No mitigation necessary	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA		NA
LOSS OF GRAZING LAND	<b>Direct impacts</b> The land on the construction site will remain as grazing after construction. The construction footprint is the only area is permanently lost.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	▲ Compensate farmers for what is lost. ▲ Keep the construction period as short as possible. ▲ Employ dust-suppressing practices to protect adjoining grazing land. ▲ Protect the land against soil erosion by following guidelines of the stormwater management plan.	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA		NA
LOSS OF AGRICULTURAL PRODUCTION (YIELD AND INCOME)	<b>Direct impacts</b> The loss of grazing is the only impact that translates to income loss.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	▲ Compensate farmers for what is lost. ▲ Keep the construction period as short as possible.	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA	NA	NA
LOSS OF AGRICULTURAL RESOURCES	<b>Direct impacts</b> The loss of resources relates to soil due to erosion and water that can be used for farming purposes.	DIRECT	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<ul style="list-style-type: none"> <li>Replace topsoil during rehabilitation and ensure that the soil is well fertilised and rolled.</li> <li>Protect the land against soil erosion by following guidelines of the stormwater management plan.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	LOCALISED	MEDIUM TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL BE LOST	EASY	LOW (-)	<ul style="list-style-type: none"> <li>Sow seed of local plants that is adapted to the climate.</li> <li>Irrigate the soil to ensure germination and establishment of the seed occurs.</li> <li>Remove all alien plants and weeds until the natural plants are well established.</li> </ul>	LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACT							NA	NA	NA
<b>TERRESTRIAL ECOLOGICAL IMPACT ASSESSMENT</b>												
ESTABLISHMENT OF ALIEN PLANT SPECIES	<b>Direct impacts</b> Failure to rehabilitate and monitor the establishment of Alien Plant Species during the Construction (and Operation Phase) could lead to the further spread and infestation of Alien Plant Species during the Operational Phase.	DIRECT	STUDY AREA	LONG-TERM	POSSIBLE	SEVERE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>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.</li> <li>The ECO 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.</li> <li>An Alien Invasive Management Plan must be compiled and implemented during the Operational Phase.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Alien Plant Species such as <i>Acacia mearnsii</i> , <i>A. dealbata</i> , <i>Cirsium vulgare</i> , <i>Solanum spp.</i> , amongst others, have already established in the surrounding area. Therefore, should the operation of the proposed MNWP WEF and MNWP 2 WEF Grid Connection lead to the further establishment of alien invasive species in the project area, the invasion by alien species could be exacerbated.	CUMULATIVE	STUDY AREA	LONG-TERM	POSSIBLE	SEVERE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	HIGH (-)	<ul style="list-style-type: none"> <li>The applicant must implement the mitigation measures listed above for the direct impacts.</li> </ul>	N/A



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION									
	<b>No-go alternative</b> Alien Invasive Plant Species have already established within the project area. Under the no-go alternative these species are likely to continue multiplying if left unchecked. The current no-go alternative is therefore classified as High.	NO-GO	STUDY AREA	LONG-TERM	DEFINITE	SEVERE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	HIGH (-)	N/A	N/A									
<b>DISTURBANCE AND/OR DEATH OF FAUNAL SPECIES</b>	<b>Direct impacts</b> During the operational phase, noise and light pollution associated with the operation and maintenance of the proposed development are likely to disturb faunal populations utilising the affected areas. WEFs release low frequency sound (or infrasound), inaudible by humans, but which can interrupt communication between larger mammal species. Additionally, operational activities such as vehicular movement and noise are likely to disturb faunal species and could result in the movement of faunal species away from the affected areas and/or the loss of faunal species. Slow-moving species such as tortoises and snakes are particularly susceptible to road kills. As such, this impact is rated moderate negative.	DIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>Regular maintenance and checks of the infrastructure must be undertaken.</li> <li>The mitigation measures specified in the Noise Impact Assessment conducted for MNWP WEF must be implemented and adhered to during the operational phase of the proposed development.</li> <li>External lighting should be avoided where possible. However, if required, lighting should be down lighting and low wattage, <a href="#">or as per CAA requirements</a>.</li> <li>Minimise access to the site.</li> <li>All individuals must sign a register prior to accessing the proposed development site.</li> <li>Speed restrictions (40 km per hour is recommended) must be implemented to reduce the chance of road kills, as well as to reduce the amount of dust caused by vehicle movement along the roads.</li> </ul>	LOW (-)									
	<b>Cumulative impacts</b> Operational activities associated with the proposed development such as vehicular movement and noise are likely to increase the disturbance of faunal species caused by existing developments and activities within the project area. As such, this impact is rated moderate negative.	CUMULATIVE	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	MODERATE (-)	<ul style="list-style-type: none"> <li>It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area.</li> <li>However, it is imperative that the applicant implement the mitigation measures listed above for the direct impacts.</li> </ul>	LOW (-)									
	<b>No-go alternative</b> Existing developments and activities will continue to disturb faunal species within the project area, even in the absence of the proposed development. The no-go alternative therefore is rated low negative.	NO-GO	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	N/A	MODERATE (-)	NA	NA									
	<b>AQUATIC IMPACT ASSESSMENT</b>																				
	<b>Turbine and laydown areas</b>																				
DIRECT ECOSYSTEM DESTRUCTION	<b>Direct impacts</b>	DIR	EC	LO	CA	LO	NIG	PR	OB	AB	MOD	RE	VE	RE	SO	JIP	ACI	EV	MODERATE -	Maintenance and management	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / DENEGRATIONAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
AND MODIFICATION IMPACTS	<p>Accidental direct impacts to rivers and/or wetlands by heavy machinery during infrastructure repair and maintenance activities, particularly if ad-hoc laydown areas required.</p> <p>Increased local and regional wetland bird fatalities as a result of turbine strikes.</p> <p><b>Note that this impact is not assessed as part of this assessment and will be assessed as part of the avifaunal impact assessment for the project.</b></p>									LOW (-)	<p>It is the applicant's responsibility to ensure the proper functioning of infrastructure that is likely to require regular on-going maintenance. This includes the stormwater management infrastructure and road infrastructure.</p> <p>It is important that the location and extent of the rivers and wetlands in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project.</p> <p>In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates the landowner/developer to control IAPs on their property.</p> <p><b>Monitoring</b> It will be important that long-term monitoring of the potential freshwater ecosystem impacts be undertaken to proactively to identify any environmental issues and impacts that may arise as a result of the operational phase of the project. The following key aspects should be monitored:</p> <ul style="list-style-type: none"> <li>Erosion and/or sedimentation in the onsite and downstream wetlands;</li> <li>Water table monitoring to determine any impacts to subsurface inputs; and</li> <li>Presence of alien invasive plants.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE - LOW (-)		LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known construction activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
INDIRECT HYDROLOGICAL AND GEOPHOMOLOGICAL IMPACTS	<p><b>Indirect impacts</b> Erosion and/or sedimentation of rivers and/or wetlands as a result of land surface hardening at turbine sites. Erosion and sedimentation impacts to wetlands include reduced wetland soil saturation due to flow concentration and/or vegetation burial. Erosion and sedimentation impacts to rivers include channel bank and bed modification and alteration in instream aquatic biotopes and riparian habitat.</p> <p>Reduced water inputs if activities cause additional soil piping and sinkholes that could intercept subsurface flows.</p>	INDIRECT	LOCALISED	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE (-)	<p><b>Remediation / Rehabilitation</b> Where appreciable direct vegetation/habitat impacts and/or indirect erosion/sedimentation impacts or hydrological impacts occur resulting from project activities, these must be reported immediately to the relevant environmental authorities, and an independent aquatic or wetland specialist appointed to conduct a site inspection to assess the residual impacts and determine the need for any onsite remediation or rehabilitation requirements. Following this assessment, <u>if significant impact have occurred</u>, an implementable remediation and/or wetland rehabilitation plan may need to be compiled and implemented to the satisfaction of KZN EDTEA and DWS.</p>	MODERATE - LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	LONG TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE (-)		LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
WATER QUALITY IMPACTS	<p><b>Direct impacts</b> Any erosion leading to sedimentation of rivers and wetlands onsite/downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality.</p> <p>Pollution of onsite and downstream rivers and onsite wetlands due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance activities (e.g. oil and diesel leaks).</p>	DIRECT	LOCALISED	LONG TERM	POSSIBLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	LONG TERM	POSSIBLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	<p><b>Direct impacts</b> Expanded / more intense edge impacts could occur as a result of deterioration in vegetation quality and cover and the potential for increased alien invasive plant invasion due to disturbance causing activities taking place near to wetlands and rivers.</p>	DIRECT	LOCALISED	LONG TERM	PROBABLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	LOCALISED	LONG TERM	PROBABLE	MODERATE-LOW	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
	<b>Internal Access and Haulage Roads</b>											
DIRECT ECOSYSTEM DESTRUCTION AND MODIFICATION IMPACTS	<p><b>Direct impacts</b> Accidental direct impacts to rivers and/or wetlands by heavy machinery during infrastructure repair and maintenance activities, particularly culverts at crossings.</p>	DIRECT	STUDY AREA	MEDIUM TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE - LOW (-)		MODERATE - LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE – LOW (-)		MODERATE - LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA		NA
INDIRECT HYDROLOGICAL AND GEOMORPHOLOGICAL IMPACTS	<p><b>Indirect impacts</b> Erosion and/or sedimentation of rivers and/or wetlands as a result of poor stormwater management at access roads. Erosion and sedimentation impacts to wetlands include reduced wetland soil saturation due to flow concentration and/or vegetation burial. Erosion and sedimentation impacts to rivers include channel bank and bed modification and alteration in instream aquatic biotopes and riparian habitat.</p> <p>Reduced water inputs where poorly planned and aligned roads intercept subsurface water movement and preferential subsurface flows paths and/or if activities cause additional soil piping and sinkholes that could intercept subsurface flows.</p>	INDIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE – HIGH (-)		MODERATE - LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	MODERATE – HIGH (-)		MODERATE - LOW (-)
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.</p>	NO-GO	NO IMPACT							NA	NA	
WATER QUALITY IMPACTS	<p><b>Direct impacts</b> Any erosion leading to sedimentation of rivers and wetlands onsite/downstream could also lead to raised water turbidity and suspended solids concentrations, also affecting water quality.</p> <p>Pollution of onsite and downstream rivers and onsite wetlands due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance activities (e.g. oil and diesel leaks).</p>	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACIEVABLE	LOW (-)		LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>moderate</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	LOW (-)		LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA
FRAGMENTATION AND ECOLOGICAL DISTURBANCE IMPACTS	<b>Direct impacts</b> Decreased local ecological connectivity as a result of the operation of new or and upgraded road watercourse crossings. If poorly sited, aligned or designed across sensitive systems, the road could act as a barrier to aquatic and wetland fauna. In particular, poorly designed culverts across aquatic habitat could result in the formation of a barrier local aquatic fauna movement (macroinvertebrates, fish and frogs).  Expanded / more intense edge impacts could occur as a result of deterioration in vegetation quality and cover and the potential for increased alien invasive plant invasion due to disturbance causing activities taking place near to rivers.	DIRECT	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)		MODERATE-LOW (-)
	<b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.	CUMULATIVE	STUDY AREA	MEDIUM TERM	PROBABLE	MODERATE-HIGH	REVERSIBLE	RESOURCE MAY BE LOST	ACHIEVABLE	MODERATE (-)		MODERATE-LOW (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of aquatic habitats as no known earthworks activities are present on site.	NO-GO	NO IMPACT							NA		NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>AVIFAUNAL IMPACT ASSESSMENT</b>												
DIRECT HABITAT DESTRUCTION	<p><b>Direct impacts</b></p> <p>The grasslands present across the site are sensitive to imbalanced burn regimes and grazing pressures.</p> <p>Grasslands receive relatively high rainfall and habitats are sensitive to alterations of flow regimes and infiltration rates, with wetlands forming an important component for many avifaunal species in the area.</p> <p>Several potential risks to the long-term functioning and persistence of these environments exist which, if unmitigated, could result in the long-term degradation or permanent loss of habitats.</p> <p>Fortunately, the potential risks are relatively easy to mitigate very effectively and are largely standard practice for these types of developments.</p> <p>In addition, downstream environments are largely degraded due to alien plant invasion.</p> <p>Increased runoff from hard surfaces during the operational phase (e.g. pylon bases, roads etc.) has the potential to increase the risk of habitat destruction through erosion, which can alter flow regimes and water tables, drain wetland environments or increase sedimentation downstream.</p> <p>These potential impacts are also easy to mitigate through the appropriate use of flow and erosion control measures.</p>	DIRECT	STUDY AREA	LONG TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	MODERATE (-)	<p><b>Direct habitat destruction</b></p> <ul style="list-style-type: none"> <li>Flow- and erosion control measures must be implemented where appropriate to reduce uncontrolled runoff from hard surfaces.</li> <li>Infrastructure must be designed in a manner that is compatible with the continuation of burn regimes implemented in the surrounding grasslands.</li> <li>No open fires are to be permitted outside of designated areas.</li> <li>The operational EMP must be developed and implemented and should include site specific measures for the effective management and treatment of any wastewater to be produced by the project.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b></p> <p>The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<p><b>Cumulative</b></p> <ul style="list-style-type: none"> <li>All appropriate mitigation measures listed above should be implemented;</li> <li>The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues;</li> <li>Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management; and</li> <li>An alien woody plant (black wattle) removal and eradication programme should be implemented by the applicant to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b></p> <p>The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DISTURBANCE AND DISPLACEMENT	<p><b>Direct impacts</b> Indirect loss of habitat from disturbance during the operational phase is associated with ongoing operational activity as well as more discrete periods of routine maintenance tasks.</p> <p>Similar to the construction phase, the avifauna in the area already experience levels of disturbance associated with agricultural activities and therefore species particularly sensitive to disturbance are unlikely to frequent the area.</p>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<p><b>Disturbance and displacement</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>All contractors are to adhere to the EMPr and must apply good environmental practice during all operations.</li> <li>Operational phase bird monitoring, in line with the latest available guidelines, must be implemented.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<p><b>Cumulative</b></p> <ul style="list-style-type: none"> <li>All appropriate mitigation measures listed above should be implemented.</li> <li>Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</li> <li>An alien woody plant (black wattle) removal and eradication programme should be implemented by the applicant to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>DIRECT MORTALITY – COLLISION WITH INFRASTRUCTURE</b>	<p><b>Direct impacts</b> WEFs can cause bird fatalities through the collision of birds with moving turbine blades.</p> <p>The most effective mitigation for collision impacts currently available is wind farm placement, as well as specific turbine placement within a WEF to avoid elevated avifaunal SCC use areas.</p> <p>Collisions with power lines are a well-documented threat to birds in southern Africa. Heavy bodied birds such as bustards, cranes and waterbirds, with limited manoeuvrability, are more susceptible to this impact.</p>	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	<b>MODERATE (-)</b>	<ul style="list-style-type: none"> <li>▲ WTGs must not be constructed within any designated Very High Sensitivity (WTG no-go) areas.</li> <li>▲ Additional mitigation (as detailed below) must be implemented for WTGs placed within High and Medium sensitivity areas.</li> <li>▲ Blade Painting (contingent on approval by the Civil Aviation Authority) must be implemented for all WTGs that are positioned within or encroach on High and Medium Sensitivity areas.</li> <li>▲ Shut-down on demand (or a similar form of automated curtailment using technology) must be implemented for all WTGs that are positioned within or encroach on High and Medium Sensitivity areas, if significant impacts (as determined by the specialist) are observed during operational phase monitoring.</li> <li>▲ Internal power lines must be buried wherever technically feasible.</li> <li>▲ Appropriate (approved) Bird Flight Diverters (BFDs) must be affixed to the entire length of novel overhead power lines (in all sensitivity categories).</li> <li>▲ 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.</li> <li>▲ If double layers of fencing are required for security purposes, they should be positioned at least 2m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences.</li> <li>▲ Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines.</li> <li>▲ Regular reviews of operational phase monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist.</li> <li>▲ The above reviews should strive to identify sensitive locations including WTGs and areas of increased collisions that may require additional mitigation.</li> <li>▲ An operational monitoring programme for any novel overhead power lines must be implemented to locate potential collision fatalities.</li> <li>▲ Any fatalities located must be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT).</li> </ul>	<b>LOW (-)</b>

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>✦ All appropriate mitigation measures listed above should be implemented.</li> <li>✦ The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>✦ Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues.</li> <li>✦ Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</li> <li>✦ An alien woody plant (black wattle) removal and eradication programme should be implemented by the applicant to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA
<b>DIRECT MORTALITY – ELECTROCUTION</b>	<p><b>Direct impacts</b> 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>	DIRECT	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>✦ Internal power lines should be buried wherever possible.</li> <li>✦ 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.</li> <li>✦ An operational monitoring programme for the overhead power line route must be implemented to locate potential collision fatalities.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> The cumulative impact of the proposed development in the context of the land-use activities found in the broader local area (including MNWP2).</p> <p>The highest potential impacts prior to mitigation would relate to the effects on aquatic habitats (particularly during the operational phase), such as possible contamination and uncontrolled runoff from hard surfaces that may result in erosion and subsequently further degradation of downstream wetlands.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	EASILY ACHIEVABLE	LOW (-)	<ul style="list-style-type: none"> <li>✦ All appropriate mitigation measures listed above should be implemented.</li> <li>✦ The project should collaborate with other developments (current and proposed) in the broader project area.</li> <li>✦ Companies in the area should share lessons learnt, align strategies and agree coordinated approaches to responding to environmental issues.</li> <li>✦ Data should be shared with regulators and interested stakeholders to allow cumulative impacts to be documented and to inform adaptive operational management.</li> <li>✦ An alien woody plant (black wattle) removal and eradication programme should be implemented by the applicant to restore currently degraded grassland and aquatic habitats.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on avifauna or habitat.</p>	NO-GO	NI IMPACT							NA	NA	NA
<b>BAT IMPACT ASSESSMENT</b>												

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSABILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>MORTALITY DUE TO WIND TURBINE COLLISION AND/OR BAROTRAUMA</b>	<p><b>Direct impacts</b> 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 in 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.</p> <p>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	STUDY AREA	LONG TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>✦ Implement blade feathering (up to the manufacturers cut-in speed) as soon as operation begins, to prevent freewheeling.</li> <li>✦ The placement of all turbines, as well as their full blade length, should avoid high sensitivity areas.</li> <li>✦ The placement of all turbines, as well as their full blade length, should avoid medium sensitivity areas, as far as possible. However, if unavoidable, then the associated features (e.g., alien woody vegetation and plantations) should be removed prior to turbines becoming operational. Should these features not be removed, then strict minimisation techniques (i.e. turbine curtailment and/or acoustic deterrence mechanisms) are to be implemented as soon as the first turbine starts spinning.</li> <li>✦ If residual impacts reach the threshold limit (at any wind turbine) as determined by the best practise guidelines applicable at the time, then appropriate minimisation measures are to be implemented (turbine curtailment and/or acoustic deterrence mechanisms).</li> <li>✦ 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.</li> <li>✦ This includes downward facing low pressure sodium and warm white LED lights.</li> </ul>	MODERATE (-)
	<p><b>Cumulative impacts - Bat Fatality</b> Multiple wind farms 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.</p> <p>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 3 onshore solar PV facilities are being considered according to the DFFE Renewable Energy database (Q3 2022), within a 50 km region of the proposed MNWP WEF.</p>	CUMULATIVE	STUDY AREA	LONG TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>✦ All mitigation measures, as listed above, are to be strictly adhered to, to reduce the probability of significant mortality impacts occurring at MNWP WEF, and subsequently on a cumulative scale as well. This will be relevant for the MNWP WEF, as well as all surrounding WEF's. Fatalities should be considered across all WEF's as far as possible, and transparency / data sharing of operational results is recommended to further consider cumulative impacts.</li> </ul>	MODERATE (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on bats or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DISTURBANCE/ DISPLACEMENT	<p><b>Direct impacts</b> Wind Farms have the potential to impact bats indirectly during the operational phase through the disturbance of roosts or when conducting activities during hours of important bat foraging activities. Relevant activities include the construction of roads, Operation and Maintenance (O&amp;M) buildings, sub-station(s), internal transmission lines and the installation of wind turbines.</p> <p>Excessive noise and dust during the operational phase could result in bats abandoning their roosts, depending on the proximity of construction activities to roosts.</p>	DIRECT	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)	<ul style="list-style-type: none"> <li>Limit operational/maintenance activities to daylight hours.</li> <li>Although no confirmed bat roosts have been identified on site to date, it is recommended that a suitably qualified bat specialist (appointed to conduct the operational phase bat monitoring programme) is to further advise on refining these recommendations as new information becomes available, during the project's operational phase.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be moderate should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	STUDY AREA	SHORT TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	MODERATE (-)		LOW (-)
	<p><b>No-go alternative</b> The no-go alternative would result in no further impacts on bats or habitat.</p>	NO-GO	NO IMPACT							NA	NA	NA
<b>HERITAGE IMPACT ASSESSMENT</b>												
	NONE											
<b>PALAEONTOLOGICAL IMPACT ASSESSMENT</b>												
	NONE											
<b>NOISE IMPACT ASSESSMENT</b>												
OPERATION OF MULILO NEWCASTLE WIND POWER WEF (WORST-CASE SPL)	<p><b>Direct impacts</b> Noise levels generated by operating WTG (using maximum worst-case SPL).</p> <p>Operational noise levels should not change the existing ambient sound levels with more than 7 dB (which could be as much as 48.5 dBA), nor should operating activities result in noise levels exceeding the 45 dBA.</p>	DIRECT	STUDY AREA	LONG TERM	PROBABLE (HIGHLY LIKELY FOR NSR 08 & 40)	SEVERE (HIGH ON NSR 08, 09, 22 & 40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	MEDIUM (-)	<ul style="list-style-type: none"> <li>The applicant should get written confirmation from NSR 08 and NSR 40 that the dwelling(s) will not be used for residential purposes in the future;</li> <li>OR</li> <li>The applicant should consider reducing the total number of WTG located within 2,000m from NSR 08 and NSR 40 if deemed necessary.</li> <li>For the layout as evaluated, the applicant should try to select a WTG with a SPL less than 108 dBA (as per the IEC 61400-14 certificate) to reduce noise levels at NSR 09 and NSR 22.</li> </ul>	LOW (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> Cumulative noises from numerous WTG of various WEFs operating simultaneously. Total cumulative noise levels should not exceed 45 dBA.	CUMULATIVE	STUDY AREA	LONG TERM	DEFINITE (DEFINITE ON NSR40) PROBABLE (LIKELY ON NSR22, 38 AND 39)	VERY SEVERE (VERY HIGH ON NSR40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>▶ The applicant should get written confirmation from NSR08 &amp; 40 that the dwelling(s) will not be used for residential purposes in the future;</li> <li>OR</li> <li>▶ The applicant should consider a change in layout to reduce the number of WTG located within 2,000m from NSR 08 &amp; NSR 40 if deemed necessary (in co-operation with Mulilo Newcastle Wind Power 2 WEF).</li> <li>▶ For the layout as evaluated, the applicant should consider selecting a WTG with a SPL less than 108 dBA (as per the IEC 61400-14 certificate).</li> </ul>	LOW (-)
	<b>No-go alternative</b> The no-go alternative would result in no further noise impacts.	NO-GO	NO IMPACT							NA	NA	NA
OPERATION OF MULILO NEWCASTLE WIND POWER WEF (REPORTED SPL)	<b>Direct impacts</b> Noise levels generated by operating WTG (using the reported noise level). Operational noise levels should not change the existing ambient sound levels with more than 7 dB (which could be as much as 48.5 dBA), nor should operating activities result in noise levels exceeding the 45 dBA.	DIRECT	STUDY AREA	LONG TERM	PROBABLE (LIKELY FOR NSR 08 & 40)	MODERATELY SEVERE (MODERATE FOR NSR 08 & 40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	MEDIUM (-)	<ul style="list-style-type: none"> <li>▶ The applicant should get written confirmation from NSR 08 and NSR 40 that the dwelling(s) will not be used for residential purposes in the future.</li> <li>OR</li> <li>▶ The applicant should consider reducing the total number of WTG located within 2,000m from NSR 08 &amp; NSR 40 if deemed necessary.</li> </ul>	LOW (-)
	<b>Cumulative impacts</b> Cumulative noises from numerous WTG of various WEFs operating simultaneously. Total cumulative noise levels should not exceed 45 dBA.	CUMULATIVE	STUDY AREA	LONG TERM	DEFINITE (DEFINITE ON NSR40)	SEVERE (HIGH ON NSR40)	REVERSIBLE	RESOURCE WILL BE PARTIALLY LOST	ACHIEVABLE	HIGH (-)	<ul style="list-style-type: none"> <li>▶ The applicant should get written confirmation from NSR08 &amp; 40 that the dwelling(s) will not be used for residential purposes in the future.</li> <li>▶ The applicant can change the layout to reduce the number of WTG located within 2,000m from NSR08 &amp; 40 (in co-operation with MNWP 2 WEF).</li> <li>▶ For the layout as evaluated, the applicant should consider selecting a WTG with a SPL less than 108 dBA (as per the IEC 61400-14 certificate).</li> </ul>	LOW (-)
	<b>No-go alternative</b> The no-go alternative would result in no further noise impacts.	NO-GO	NO IMPACT							NA	NA	NA

**SOCIO-ECONOMIC IMPACT ASSESSMENT**



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
NEW EMPLOYMENT AND ECONOMIC IMPACTS	<p><b>Direct impacts</b> Direct and indirect employment opportunities will manifest during the operational lifespan of the Project and result in an increase in household earnings and improved livelihoods through salaries and wages.</p> <p>Economic impacts will occur for the local and national economies through the manufacturing and services industries. Induced economic impacts will realize through employment and procurement and as a result more benefits for retail sales, leisure and hospitality, real estate, etc. will occur as more money flows in the local economy.</p> <p>Furthermore, agricultural land will be rezoned for renewable energy purposes, thereby increasing farm values and resulting in higher payable taxes for the local municipality.</p>	DIRECT, INDIRECT	REGIONAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	MODERATE (+)	<p>Enhance benefits:</p> <ul style="list-style-type: none"> <li>▲ Maximise local employment and procurement (from the local and district municipalities) wherever possible.</li> <li>▲ Coordinate the effort to obtain temporary employment, service providers, SMME's etc. required for maintenance work, with the municipal LED Unit.</li> <li>▲ Assist and guide the local community with regards to the needs of the WEF plant and the types of supporting industries and services required for its successful operation. If feasible, make ED funding available to assist the existing municipal initiatives with skills training and capacity building of SMME's.</li> <li>▲ Make employment creation one of the SED program's targets, aims and objectives. Local businesses that apply for SED funding have to demonstrate their commitment to employment creation (criteria for evaluation by the Implementing and Monitoring Agent).</li> </ul>	MODERATE (+)
	<p><b>Cumulative economic impacts</b> As a result of construction, maintenance and repairs, as well as skills development and capacity building, the construction and operational phases will result in positive cumulative economic impacts nationally and locally in terms of:</p> <ul style="list-style-type: none"> <li>▲ Permanent, temporary and indirect employment creation;</li> <li>▲ Creation of new business opportunities locally and nationally, as well as further downstream opportunities through indirect and induced impacts especially with regards to the manufacturing and service industries; and</li> <li>▲ Improvement of livelihoods of benefitting households that result in increasing spending power, with spin-off effects on local and regional businesses such as retail, leisure, real estate and so forth.</li> </ul>	CUMULATIVE	NATIONAL	LONG-TERM	DEFINITE	SEVERE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	HIGH (+)	No mitigation is required.	HIGH (+)
	<p><b>Cumulative social impacts</b> Long-term negative social impacts that remain once a workforce leave an area are evident in provinces such as the Northern and Western Cape, where large-scale RE projects are already operational. Long-term issues - which usually become the local municipalities' responsibility - include unusual population growth rates coupled with an increase in the unemployed, social issues (increase in HIV/AIDS, unwanted pregnancies and absent fathers) culminating in pressure on local government services (health care, infrastructure services and housing provision).</p>	DIRECT, INDIRECT	REGIONAL	LONG-TERM	POSSIBLE	MODERATE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▲ Maximise local employment.</li> <li>▲ Implement all the mitigation measures as proposed in Section 7.7 of the SEIA.</li> </ul>	LOW (-)
	<p><b>No-go alternative</b> New employment, direct and induced economic impacts will not manifest local nor nationally.</p>	NO-GO	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	N/A	MODERATE (-)	▲

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
IMPACTS ON LIVELIHOODS OF DIRECTLY BENEFITTING LANDOWNERS	<b>Direct impacts</b> During the operational period the IPP will sign a long-term lease agreement with the affected landowners where turbines and associate infrastructure are located, thereby compensating them through an annual fee. Details of the option-to-lease agreements are confidential. However, the compensation will increase the landowners' incomes and revenue and can be used to further invest in their properties, increase productivity and employment, or improve financial security.	DIRECT	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	VERY DIFFICULT	LOW (+)	Minimize/reduce impact: ▲ Consider the potential increase in rates and taxes during the negotiation processes with landowners.	LOW (+)
	<b>Cumulative impacts</b> The number of households benefitting during the operational phase as a result of incomes earned through lease agreements, will increase to approximately 8 (based on 74 turbine localities).	DIRECT	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	LOW (+)	No mitigation is required.	LOW (+)
	<b>No-go alternative</b> No incomes and subsequent improvement of livelihoods for landowners through lease agreements.	NO-GO	LOCALISED	LONG-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	N/A	LOW (-)	▲ NA
SOCIO-ECONOMIC CONTRIBUTION / COMMUNITY DEVELOPMENT	Approximately 2.1% of revenue is allocated towards the implementation of SED and ED projects. Spending of funds are monitored through the Independent Power Producer Office (IPPO).	DIRECT	REGIONAL	LONG-TERM	DEFINITE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	ACHIEVABLE	LOW (+)	Enhance benefits: ▲ Involve the local and district municipalities' LED Units in all processes when SED and ED projects and suitable candidates for projects and/or training programmes are identified. ▲ Join the existing Newcastle LED Forum and align projects with the goals and objectives identified for the region's trade and industry sectors. ▲ Make gender and Youth issues a specific outcome of the needs analysis to ensure that these groups are targeted. ▲ Ensure further transparency and effective information sharing through industry associated websites, emailed newsletters, municipal noticeboards, information events and meetings and existing community channels used by the various wards. ▲ Become involved in local initiatives that address existing backlogs to ensure that real community based needs are met.	MODERATE (+)
	<b>No-go alternative</b> No community and infrastructure projects that would contribute to job creation and community development.	DIRECT	REGIONAL	LONG-TERM	DEFINITE	SLIGHT	N/A	N/A	N/A	N/A	LOW (-)	NA



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
IMPACTS ON TOURISM / ACCOMMODATION FACILITIES / PROTECTED AREAS	<p><b>Indirect impacts</b> Draaiwater Lodge, Drakensbergkloof, Grey Goose Game Farm, Newcastle Country Lodge and Sneeuwberg PE would be particularly vulnerable to potential negative visual impacts.</p> <p>However, other factors than visual exposure would also impact tourism, such as local conditions, markets, location, technologies, size of the facility and the receiving environment (communities, tourist activities, landscape, etc.).</p> <p>The impact on tourism as a result of wind farm developments is not easily measured and international and local research are inconclusive about the topic.</p>	INDIRECT	MUNICIPAL	LONG-TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	DIFFICULT	LOW (-)	<p>Avoid/prevent impact:</p> <ul style="list-style-type: none"> <li>Based on the Specialist VIA findings, consult with individual tourism establishments that would experience a high or very high visual impact and/or who are concerned that revenues will be affected. <del>Consider eliminating specific turbines from the development if feasible.</del></li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Even though it is possible that visual exposure and impacts on the landscape character could increase for some of the tourism establishments and Protected Areas, the consequence of the cumulative impact on tourism would not increase to such a degree that the overall significance would change.</p>	INDIRECT	MUNICIPAL	LONG-TERM	POSSIBLE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	LOW -	No mitigation is proposed.	LOW -
	<p><b>No-go alternative</b> Existing tourism market and tourism status quo would continue.</p>	N/A	MUNICIPAL	LONG-TERM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA
IMPACTS ON LAND VALUES	<p><b>Direct impacts</b> Impacts of wind farms on land values is an indecisive matter. However, based on local and international research and the SEIA Specialist's consultation with estate agents and other experts, it is the professional opinion of the SEIA Consultant that negative impacts on land values during the operational phase of the MNWP facility are unlikely, and property prices might even increase for the duration of operations. It is however possible that individual negative perceptions towards the infrastructure may affect property sales negatively in terms of possible prolonged sale periods and fewer buyers' interests.</p>	INDIRECT	STUDY AREA	LONG-TERM	UNSURE	SLIGHT	REVERSIBLE	RESOURCE WILL NOT BE LOST	VERY DIFFICULT	LOW (-)	No mitigation is proposed.	LOW (-)
	<p><b>Cumulative impacts</b> It is possible that negative cumulative impacts on land values could manifest for individual properties. However, the assessment of the cumulative impact on farmland values are inconclusive as there are too many variables that could affect the impact, whether positive or negative, and no rating is provided.</p>	INDIRECT	STUDY AREA	LONG-TERM	POSSIBLE	N/A	REVERSIBLE	RESOURCE WILL NOT BE LOST	N/A	N/A		N/A
	<p><b>No-go alternative</b> No impacts on land values and the status quo continues.</p>	NO-GO	NO IMPACTS							N/A	N/A	N/A

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
INTRUSION IMPACTS	<p><b>Direct and indirect impacts</b> Intrusion impacts during operations refer to nuisance issues experienced with regard to an increase in traffic (limited) and movement of maintenance personnel, noise and visual / aesthetic / light impacts due to the presence of turbines and night-time shadow flicker.</p> <p>Indirect impacts on agricultural land uses are possible, including:</p> <ul style="list-style-type: none"> <li>▶ Gates that are left open or not locked resulting in animals that go missing and/or mix with animals in different breeding groups / cycles;</li> <li>▶ Livestock that is killed on access roads if wind farm vehicles speed and disobey traffic rules;</li> <li>▶ A potential increase in stock theft and illegal poaching;</li> <li>▶ Potential veld fires that damage farmland and farm infrastructure; and</li> <li>▶ Insufficient biosecurity measures / screening of workers (biological risks), potentially introducing diseases to livestock breeding farms.</li> </ul>	DIRECT, INDIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE MAY BE PARTLY LOST	ACHIEVABLE	MODERATE (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▶ Implement an effective Land Use Management programme (procedures when gates are opened and closed, road maintenance, implementation of methods to address potential veld fires, no-go areas, etc.) in collaboration with the landowners.</li> <li>▶ Implement all mitigation and management measures as proposed by the VIA and NIA Specialists.</li> </ul>	LOW (-)
	<p><b>Cumulative impacts</b> Since impacts associated with traffic, noise, air / dust pollution and shadow flicker are usually mitigated satisfactorily for wind farm projects, the assumption is drawn that mitigation will also be done sufficiently for the Mulilo Newcastle WEF Complex. Visual impacts can, however, not be mitigated easily and it is thus probable that that negative cumulative visual impacts will be high.</p>	DIRECT	STUDY AREA	LONG-TERM	PROBABLE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	MODERATE (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▶ Implement an effective Land Use Management programme (procedures when gates are opened and closed, road maintenance, implementation of methods to address potential veld fires, no-go areas, etc.) in collaboration with the landowners.</li> <li>▶ Implement all mitigation and management measures as proposed by the VIA and NIA Specialists.</li> </ul>	MODERATE (-)
	<p><b>No-go alternative</b> No negative intrusion impacts will manifest for landowners.</p>	NO-GO	NO IMPACTS							N/A	N/A	N/A
IMPACTS ON SENSE OF PLACE	<p><b>Direct and indirect impacts</b> The social impact associated with the long-term impact on the sense of place relate to a change in the landscape character, intrusion impacts and potential changes to the safety and security and social surroundings that landowners and community members currently experience.</p>	DIRECT, INDIRECT	STUDY AREA	LONG-TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	HIGH (-)	<p>Minimize/reduce impact:</p> <ul style="list-style-type: none"> <li>▶ Implement all relevant mitigation measures as proposed to reduce intrusion impacts.</li> <li>▶ Implement all measures as proposed in the VIA and NIA Reports.</li> <li>▶ As far as possible, avoid turbines to be located in direct view of residences and / tourist and holiday accommodation establishments.</li> <li>▶ Implement measures to increase communication and transparency between the land owners and Project as proposed in the previous sections of this report.</li> </ul>	MODERATE (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> The cumulative impact on sense of place would be associated with changes in the landscape character as a result of visual impacts of the Mulilo Newcastle WEF Complex, as well as negative intrusion impacts that changes the community's perception of their living environment. Landowners could also easily attribute an increase in stock theft and crime levels to these collective developments due to the inflow of people and poor land use management practices, which could further result in negative effects on the current sense of place they experience.	DIRECT, INDIRECT	STUDY AREA	LONG-TERM	PROBABLE	SEVERE	REVERSIBLE	RESOURCE WILL NOT BE LOST	DIFFICULT	HIGH (-)	Minimize/reduce impact: <ul style="list-style-type: none"> <li>Implement all relevant measures to reduce intrusion impacts and as proposed in the Specialist NIA and VIA reports.</li> <li>As far as possible, avoid turbines to be located in direct view of residences and / or tourist and holiday accommodation establishments.</li> </ul> Implement measures to increase communication and transparency between the land owners and IPP, as proposed in the previous sections of this report.	HIGH (-)
	<b>No-go alternative</b> Status quo remains. No impact on sense of place occurs for community members and landowners.	NO-GO	NO IMPACTS							N/A	N/A	N/A
CONTRIBUTION TO NATIONAL POWER SUPPLY	<b>Direct and indirect impacts</b> The proposed MNWP facility will generate up to 200MW electricity and enhance the reliability and stability of supply that would contribute to economic development in the country as a whole.	DIRECT, INDIRECT	NATIONAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	RESOURCE WILL NOT BE LOST	N/A	MODERATE (+)	<ul style="list-style-type: none"> <li>No mitigation required.</li> </ul>	MODERATE (+)
	<b>Cumulative impacts</b> Positive cumulative impacts will manifest for national power supply as well as economic development, as the energy output of the two facilities combined will increase to up to 400MW.	DIRECT, INDIRECT	NATIONAL	LONG-TERM	DEFINITE	BENEFICIAL	REVERSIBLE	RESOURCE WILL NOT BE LOST	VERY DIFFICULT	HIGH (+)	<ul style="list-style-type: none"> <li>No mitigation is required.</li> </ul>	HIGH (+)
	<b>No-go alternative</b> No contribution to national power supply and economic benefits related thereto do not occur.	DIRECT, INDIRECT	NATIONAL	LONG-TERM	DEFINITE	MODERATE	N/A	N/A	N/A	MODERATE (-)	NA	N/A
<b>VISUAL IMPACT ASSESSMENT</b>												
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	<b>Direct impacts</b> The visual impacts of facility operations on sensitive visual receptors (i.e. residents of farm and homestead, as well as observers travelling along the R34) in close proximity to the proposed MNWP - Northern WEF. (i.e. within 5km) is expected to be of very high significance. No mitigation is possible for a facility of this scale, but measures have been included as best practice guidelines.	DIRECT	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	VERY HIGH (-)	<ul style="list-style-type: none"> <li>Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.</li> <li>Maintain the general appearance of the facility as a whole.</li> <li>Monitor rehabilitated areas and implement remedial action as and when required.</li> </ul>	VEVERY HIGH (-)



ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>Cumulative impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.	CUMULATIVE	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	VERY HIGH (-)		VERY HIGH (-)
	<b>No-go alternative</b> Status quo remains with no additional visual impacts.	NO-GO	NO IMPACTS							NA	NA	NA
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON SENSITIVE VISUAL RECEPTORS WITHIN THE REGION	<b>Direct impacts</b> The visual impact of facility operations on sensitive visual receptors (i.e. users of the R34 and other secondary roads, residents of farm and homesteads and visitors to sections of the Sneeuwberg Protected Environment) within the region (i.e. beyond the 5km offset) is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines.	DIRECT	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<b>Site development &amp; Operation:</b> <ul style="list-style-type: none"> <li>Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.</li> <li>Retain natural pockets (wetland, river and other sensitive vegetation zones) as buffers within the property and along the perimeter.</li> <li>Dust suppression techniques should be in place at all times during the site development and operational phases.</li> </ul>	HIGH (-)
	<b>Cumulative impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.	CUMULATIVE	REGIONAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<ul style="list-style-type: none"> <li>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.</li> <li>Keeping infrastructure at minimum heights.</li> <li>Introducing landscaping measures such as vegetating berms.</li> <li>Avoid the use of highly reflective material.</li> <li>Maintain the general appearance of the site as a whole.</li> </ul> <b>Lighting</b> <ul style="list-style-type: none"> <li>Lighting should be kept to a minimum wherever possible.</li> <li>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.</li> <li>Wherever possible, lights should be directed downwards to avoid illuminating the sky.</li> <li>Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement, <a href="#">or required by CAA regulations.</a></li> </ul>	HIGH (-)
	<b>No-go alternative</b> Status quo remains with no additional visual impacts.	NO-GO	NO IMPACTS							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>POTENTIAL VISUAL IMPACT OF OPERATIONAL LIGHTING AT NIGHT ON SENSITIVE VISUAL RECEPTORS IN THE REGION</b>	<b>Direct impacts</b> 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.  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 impact 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.  Lastly 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.	DIRECT	LOCAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	DIFFICULT	HIGH (-)	<b>Planning &amp; operation:</b> <ul style="list-style-type: none"> <li>✦ Aviation standards and CAA Regulations for turbine lighting must be followed.</li> <li>✦ 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.</li> <li>✦ Install aircraft warning lights <del>that only activate when the presence of an aircraft is detected, if permitted by as per</del> CAA requirements.</li> <li>✦ Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).</li> <li>✦ Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights.</li> <li>✦ Make use of minimum lumen or wattage in fixtures.</li> <li>✦ Make use of down-lighters, or shielded fixtures.</li> <li>✦ Make use of Low-Pressure Sodium lighting or other types of low impact lighting.</li> <li>✦ 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.</li> </ul>	MODERATE (-)
	<b>Cumulative impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines) 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.	CUMULATIVE	LOCAL	LONG-TERM	DEFINITE	VERY HIGH	REVERSIBLE	NO	DIFFICULT	HIGH (-)		MODERATE (-)
	<b>No-go alternative</b> Status quo remains with no additional visual impacts.	NO-GO	NO IMPACTS							NA	NA	NA

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
POTENTIAL VISUAL IMPACT OF SHADOW FLICKER ON SENSITIVE VISUAL RECEPTORS IN CLOSE PROXIMITY TO THE PROPOSED DEVELOPMENT	<p><b>Direct impacts</b> 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 1 Km buffer along the edge of the outer most turbines is identified as the zone within which there is a risk of shadow flicker occurring.</p> <p>A few homesteads and a small portion of the R34 are located within the 1 Km buffer, however it is expected that the shadow flicker experienced by motorist traveling along roads will be fleeting and not constitute a shadow flicker visual impact of concern. Additionally, it can be expected that shadow flicker will be experienced by sensitive receptors who are predominately located on the southern half of the potential flicker zones, namely to the west, south west, south, south east and east following the traction of the sun from east to west. In this regard, any homesteads located to the north would lower the probability of this impact occurring. The significance of shadow flicker is therefore anticipated to be High.</p>	DIRECT	LOCAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	NO	DIFFICULT	HIGH (-)	No mitigation measures proposed.	MODERATE (-)
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	NO IMPACTS							NA	No mitigation measures proposed.	NA
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACTS							NA	NA	NA
ANCILLARY INFRASTRUCTURE	<p><b>Direct impacts</b> On-site ancillary infrastructure associated with the Mulilo Newcastle Wind Power- Northern WEF includes a 33/132kV collector substation, underground 33kV cabling between the wind turbines, internal access roads and operations and maintenance buildings. 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.</p> <p>The anticipated visual impact resulting from this infrastructure is likely to be of moderate significance both before and after mitigation.</p>	DIRECT	LOCAL	LONG-TERM	DEFINITE	MODERATE	REVERSIBLE	NO	DIFFICULT	MODERATE (-)	No mitigation measures proposed.	MODERATE (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<p><b>Cumulative impacts</b> Cumulative impact, on a localised scale, would be <u>low</u> should the MNWP WEF and MNWP 2 WEF clusters construction timelines overlap. However, it is important to note that the 2 WEFs and their associated infrastructure are proposed by the same developer and the EMPs will be prepared to the same standard.</p>	CUMULATIVE	NO IMPACTS							NA	No mitigation measures proposed.	NA
	<p><b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.</p>	NO-GO	NO IMPACTS							NA	NA	NA
<p><b>POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON THE VISUAL CHARACTER OF THE LANDSCAPE AND SENSE OF PLACE OF THE REGION</b></p>	<p><b>Direct impacts</b> 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.</p> <p>A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the 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 undeveloped and natural in character. The visual quality of the region is generally high and large tracts of intact vegetation characterise most of the visual environment, as well as, the scenic mountains and ridges. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation.</p> <p>The anticipated visual impact on the visual character and sense of place of the study area is expected to be of high significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.</p>	DIRECT	REGIONAL	LONG-TERM	DEFINITE	HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<p><b>Planning:</b></p> <ul style="list-style-type: none"> <li>✦ Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.</li> <li>✦ Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised.</li> <li>✦ Use existing roads wherever possible. Where new roads are 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.</li> </ul> <p><b>Construction:</b></p> <ul style="list-style-type: none"> <li>✦ Rehabilitate all construction areas.</li> <li>✦ Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.</li> </ul> <p><b>Operations:</b></p> <ul style="list-style-type: none"> <li>✦ Maintain the general appearance of the facility as a whole.</li> <li>✦ Monitor rehabilitated areas, and implement remedial action as and when required.</li> </ul> <p><b>Decommissioning:</b></p> <ul style="list-style-type: none"> <li>✦ Remove infrastructure not required for the post-decommissioning use of the site.</li> <li>✦ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.</li> <li>✦ Monitor rehabilitated areas post-decommissioning and implement remedial actions.</li> </ul>	HIGH (-)
	<p><b>Cumulative impacts:</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.</p>	CUMULATIVE	REGIONAL	LONG-TERM	DEFINITE	HIGH	REVERSIBLE	NO	VERY DIFFICULT	HIGH (-)	<ul style="list-style-type: none"> <li>✦ Monitor rehabilitated areas post-decommissioning and implement remedial actions.</li> </ul>	HIGH (-)

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACTS						NA	NA	NA	
POTENTIAL VISUAL IMPACT OF FACILITY OPERATIONS ON PROTECTED/ CONSERVATION AREAS WITHIN THE REGION.	<b>Direct impacts</b> The greater region is generally seen as having a high scenic value and tourism value potential to a certain extent owing to the presence of a number of protected areas (Sneeuwberg Protected Environment, Seekoeivlei Nature Reserve, Potberg Private Nature Reserve and Ncandu Nature Reserve). The landscape is characterised by undulating hills with a high visual quality and strong sense of place. This study area is not known as a tourist destination, but Newcastle is an alternate route for travellers from Gauteng to Durban. Additionally, Newcastle is part of the KZN Battlefields Route where the Majuba Mountain has historical significance.  The anticipated visual impact of the proposed MNWP (Northern) WEF on protected/conservation areas within the region is therefore expected to be of moderate significance. No mitigation is possible within this environment and for a facility of this scale, but measures have been included as best practice guidelines. The table below illustrates the assessment of this anticipated impact.	DIRECT	REGIONAL	LONG-TERM	HIGHLY PROBABLE	MODERATE	REVERSIBLE	NO	VERY DIFFICULT	MODERATE (-)	As above	MODERATE (-)
	<b>Cumulative impacts:</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF (45 turbines) together with the proposed Southern WEF (35 turbines), is expected to contribute to the increased cumulative visual impact of renewable energy facilities in the region.	CUMULATIVE	REGIONAL	LONG-TERM	HIGHLY PROBABLE	MODERATE	REVERSIBLE	NO	VERY DIFFICULT	MODERATE (-)	As above	MODERATE (-)
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO	NO IMPACTS						NA	NA	NA	
POTENTIAL CUMULATIVE VISUAL IMPACT OF WIND ENERGY FACILITIES WITHIN THE REGION	<b>Direct impacts</b> The construction of the Mulilo Newcastle Wind Power-Northern WEF may increase the cumulative visual impact of industrial type infrastructure within the region.  The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. Visual impacts are likely to be of high significance.	DIRECT	REGIONAL	LONG-TERM	HIGHLY PROBABLE	MODERATE	REVERSIBLE	NO	VERY DIFFICULT	MODERATE (-)	NA	HIGH (-)
	<b>Cumulative impacts:</b> NA	CUMULATIVE	NO IMPACTS						NA	NA	NA	

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE	TEMPORAL SCALE	CERTAINTY SCALE	SEVERITY / BENEFICIAL	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	
													NO IMPACTS
	<b>No-go alternative</b> No-go alternative would result in no impact related to disturbance of agricultural system as no known construction activities are present on site.	NO-GO									NA	NA	NA
<b>TRAFFIC IMPACT ASSESSMENT</b>													
<b>TRAFFIC CONFLICT AND CONGESTION DURING CONSTRUCTION OF THE WEF</b>	The Traffic Feasibility Assessment considered the following main traffic impacts related to the following aspects: <ul style="list-style-type: none"> <li>▲ Existing operating conditions;</li> <li>▲ Traffic volumes;</li> <li>▲ Internal traffic circulation and parking;</li> <li>▲ Access proposals;</li> <li>▲ Road improvements;</li> <li>▲ Building lines; and</li> <li>▲ Abnormal loads.</li> </ul>	DIRECT	REGIONAL	SHORT-TERM	PROBABLE	MODERATE	REVERSIBLE	NO	ACIEVABLE	MODERATE (-)	<p><b>Traffic and Transportation Management Plan</b></p> <ul style="list-style-type: none"> <li>• The Traffic and Transportation Management Plan provided in the TIA must be followed and implemented during the construction phase of the WEF.</li> </ul> <p><b>Building lines</b></p> <ul style="list-style-type: none"> <li>• All other structures shall be erected at least 60m from a national or provincial road reserve fence and 500m from an intersection.</li> </ul> <p><b>R34/Access Road intersection</b></p> <ul style="list-style-type: none"> <li>• There must be no vehicular accesses permitted onto the R34 other than at the proposed/existing access. It is therefore recommended that a suitable barrier be erected to prohibit such access. In this regard, the current fence serves such purpose.</li> <li>• Vegetation should be cleared (in the form of cutting the long grass) on the two southern corners of the R34 access intersection.</li> </ul> <p><b>Abnormal load vehicles</b></p> <ul style="list-style-type: none"> <li>• During the construction stage the abnormal load vehicles expected at the site will require the bell mouth of the R34/Access Road intersection to be increased to accommodate the large turning radius of these vehicles. The extent of the widening must be determined at the detailed design stage.</li> </ul> <p><b>Internal roads</b></p> <ul style="list-style-type: none"> <li>• The internal gravel roadways should be designed in accordance with the Guidelines for Human Settlement Planning and Design ("The Redbook"). Geometric designs of the roads should ensure that the requirements of all types of vehicles expected to visit the site are met, i.e. minimum turning radii, roadway widths, etc. The pavement design, where necessary, will form part of the detailed design stage.</li> </ul> <p><b>General traffic and transportation</b></p> <ul style="list-style-type: none"> <li>• All road works must comply with the SARTSM, Chapter 13 and Volume 2.</li> <li>• Temporary traffic control zone signs must be adequate in order to convey both general and specific messages to the road users.</li> <li>• Adequate signage must be placed on the roads, such as: speed limits, caution: electrical road works in progress, use of alternative roads, stop/go signs, flagman ahead, etc.</li> </ul>	LOW (-)	



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											<p><b>Transporting of construction staff</b></p> <ul style="list-style-type: none"> <li>Company transport must be in the form of appropriate transportation vehicle/s. No persons must be transported in the back of a bakkie.</li> </ul> <p><b>Site access control</b></p> <ul style="list-style-type: none"> <li>Access control must be managed at the gate to ensure that no authorized person enters the site unless a valid access card is presented at the gate to the security guards.</li> <li>Control at pick-up locations prior to entering the transportation vehicle/s, must ensure that no unauthorized person enters the site.</li> <li>All persons must be inducted before entering the gate and proof of induction must be kept for inspection purposes.</li> <li>Upon entering the site all persons must undergo alcohol testing.</li> <li>All vehicles entering the site must have a beacon light and a whip and flag to ensure that these vehicles are visible.</li> <li>Necessary signage must be placed where needed and only vehicles designated as construction vehicles will be allowed to travel on the main roads.</li> <li>No private vehicles should be allowed to travel on the main roads. Those travelling with private vehicles should be escorted to the site with their vehicles and from there escorted in designated construction vehicles.</li> </ul> <p><b>Parking areas</b></p> <ul style="list-style-type: none"> <li>Designated parking areas must be identified on site where vehicles will park during the day.</li> <li>A designated walkway should also be created which should be barricaded, whereby workers can walk to access their work areas.</li> </ul>	