

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Aquatic / Freshwater																				
Impact 1: Loss of aquatic species of special concern during the construction or decommissioning of the grid options	The construction activities will result in the disturbance of aquatic habitats that may contain listed and or protected plant or animal species. However, none of these were observed during this assessment	1	1	1	1	1	1	5	-	Low	<ul style="list-style-type: none"> Develop and implement a Rehabilitation and Monitoring plan post Environmental Authorisation. This must be developed following the finalisation of the tower positions and access tracks and a walk down has been completed. This plan should include relocation of suitable plant species, but more important protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site Where possible, temporary construction lay-down or assembly areas should be sited on transformed areas; and Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re- establishment of plant cover is desirable to prevent erosion. 	1	1	1	1	1	1	5	-	Low
Impact 2: Damage or loss of riparian systems, ephemeral watercourses and wetland systems in the construction or decommissioning of the grid options	Construction could result in the loss of drainage systems that are fully functional and provide an ecosystem service within the site especially where new access roads to install any of the grid options as both alternatives will need to span watercourses with seeps. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example.	2	3	2	2	3	2	24	-	Medium	<ul style="list-style-type: none"> A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout. All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. Where roads and crossings are upgraded, the following applies: etc). It is recommended that no new tracks or towers / pylons are placed / constructed within any of the delineated aquatic zones. 	1	3	2	1	2	2	18	-	Low
Impact 3: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During construction earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system.	1	3	2	2	3	3	33	-	Medium	<ul style="list-style-type: none"> All liquid chemicals including fuels and oil, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely. Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment). Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel. All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses. Littering and contamination associated with construction activity must be avoided through effective construction camp management. No stockpiling should take place within or near a water course 	1	3	2	1	2	2	18	-	Low

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Faunal Habitat	Loss of Faunal Habitat: Activity will result in the loss of habitat for faunal species.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the footprint. It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas. 	1	1	2	2	3	1	9	-	Low
Faunal Processes	Disruptions to faunal processes Including barriers to movement and gene dispersal.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A reptile handler should be on call for such circumstances. Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented. 	1	1	2	2	3	1	9	-	Low
Faunal Species	Loss of faunal SSC due to construction activities: Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> A pre-commencement faunal search and rescue is recommended. Respective permits to be obtained beforehand. No animals are to be harmed or killed during the course of operations. Workers are NOT allowed to snare any faunal species. 	1	1	2	2	3	1	9	-	Low
Agricultural - none identified																				
Avifauna																				
Habitat destruction	Habitat loss (including foraging and breeding) and fragmentation due to displacement (avoidance of disturbance) as a result of infrastructure installation (Grid related infrastructure such as powerlines and pylons) and associated dust effects. Habitat loss has the tendency to not only destroy existing habitat but also displace bird species from natural habitat. This	2	4	3	2	2	3	39	-	Medium	Impacts associated with the loss of bird foraging habitat due to construction activity cannot be mitigated in relation to the majority of the habitats but can be mitigated by avoiding avifaunal specific highly sensitive areas and their associated buffers, such as the local drainage lines, impoundments, smaller watercourses, pans and rocky koppies. The overall severity of the impact can be reduced to being insignificant if avoidance mitigation is applied related to the positioning of the Grid Connection Infrastructure and powerlines.	2	2	2	1	3	2	20	-	Low

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	specifically has a greater impact on bird species restricted to a specific habitat and its requirements.																			
Disturbance of bird roosts	The destruction or disturbance of bird roosts during the construction phase	2	3	2	2	2	2	22	-	Low	No mitigation intervention required.	2	3	2	2	2	2	22	-	Low
Disturbance due to noise such as, machinery movements.	Disturbance (including of roosting and nesting SCC) due to noise such as, machinery movements and maintenance operations during the construction phase the proposed Grid Connection Infrastructure causing loss of offspring for a generation.	2	3	2	2	2	2	22	-	Low	No mitigation intervention required.	2	3	2	2	2	2	22	-	Low
Geotech																				
Disturbance/ displacement/ removal of soil and rock	Ground disturbance during access road construction, foundation earthworks, platform earthworks	1	4	2	2	3	1	12	-	Low	<ul style="list-style-type: none"> Design access roads and pile locations to minimise earthworks and levelling based on high resolution ground contour information. Correct topsoil and spoil management 	1	4	2	1	3	1	11	-	Low
Soil Erosion	Increased erosion due to vegetation clearing, alteration of natural drainage	1	4	2	2	2	1	11	-	Low	<ul style="list-style-type: none"> Avoid development in preferential drainage paths. Appropriate engineering design of road drainage and watercourse crossings Temporary berms and drainage channels to divert surface runoff where needed. Landscape and rehabilitate disturbed areas timeously (e.g. regressing) Use designated access and laydown areas only to minimise disturbance to surrounding areas 	1	2	1	1	2	1	7	-	Low
Social																				
Noise impact	Noise at the site and the construction vehicles ferrying building materials	1	4	2	1	1	2	18	-	Low	<ul style="list-style-type: none"> Installation of noise buffers 	1	2	1	1	1	1	6	-	Low
Impacts on biodiversity	Habitat loss to make way for large-scale solar facilities.	1	4	3	3	3	3	42	-	Medium	<ul style="list-style-type: none"> Locate developments away from important habitat for faunal species, particularly those that are threatened. 	1	2	2	2	2	2	18	-	Low
Loss of agricultural land	Is a function of the size of the area of land that is impacted and the production potential, of that impacted land.	1	2	3	3	3	3	36	-	Medium	<ul style="list-style-type: none"> Avoid land that has agricultural potential. 	1	1	2	2	2	2	16	-	Low
Cultural heritage impacts	If the facility is located near sacred areas, cultural practices will be affected. Recent archaeological field assessment conducted for other solar PV facilities located approximately 10km from the proposed development area identified some cultural remains but	1	2	2	2	3	3	30	-	Medium	<ul style="list-style-type: none"> Construction near pristine natural regions, sacred sites, and communities should be avoided during site projects. It is important to conduct an archaeological assessment of the 	1	1	1	2	2	2	14	-	Low

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	with varied value and preservation. It is likely that similar heritage resources may be present within this development area. (CTS Heritage, 2022).											regions up for development and evaluate any potential implications on such resources.								
Graves	Identification of human remains indicating a former burial place or the simple existence of a known cemetery during construction.	1	2	2	2	3	3	30	-	Medium	<ul style="list-style-type: none"> The recorded cemetery must be avoided with a 30m buffer zone. The site must be fenced and access for family members must be ensured; alternatively, the graves can be relocated, adhering to all legal requirements. 	1	1	1	2	2	2	14	-	Low
Road and traffic hazards	Heavy construction vehicles on poor roads will cause potholes to form, and accidents will rise.	1	4	3	3	3	3	42	-	Medium	<ul style="list-style-type: none"> Ensure the nearby roadways are maintained properly, and that traffic laws for transporting workers and contractors are adhered to. 	1	2	2	2	2	2	22	-	Low
Social impacts: job creation	Creation of jobs and local economic opportunities	1	3	2	2	3	2	22	+	Medium	<ul style="list-style-type: none"> Ensure local employment policy is in place and on-the-job training for unskilled workers 	1	2	1	1	2	1	7	+	Low
Heritage																				
Impacts to archaeological heritage resources	Construction activities that take place near to archaeological resources may result in their	1	3	4	3	4	3	45	-	High	<ul style="list-style-type: none"> A no development buffer of 50m is implemented around sites KS3 and KS4 A no development buffer of 100m is implemented around sites KS6, KS7 and KS8 The area identified as having higher levels of archaeological sensitivity must not be impacted by any development activities. Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted. Should Alternative 2 be approved, the alignment would have to be immediately adjacent to the existing and a micro-siting exercise would have to take place for the pylon footings in order to ensure that significant heritage resources are not impacted. 	1	1	4	1	4	1	11	-	Low
Impacts to palaeontological resources	Construction activities that take place near to palaeontological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low
Impacts to the cultural landscape	Construction activities that take place near to cultural landscape elements may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the recommendations included in the VIA 	1	1	4	1	4	1	11	-	Low
Visual																				
Altered Sense of Place and Visual Intrusion caused by Construction Activities (applicable)	Dust generated during construction will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the	2	4	1	2	1	3	30	-	Medium	<ul style="list-style-type: none"> Limit vegetation clearance and the footprint of construction to what is absolutely essential. Consolidate the footprint of the construction camp to a functional minimum. 	2	3	1	2	1	2	18	-	Low

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Impact 4 Impact on aquatic systems through the possible increase in surface water runoff on form and function during the operational phase from any of the access tracks, although none should cross the delineated systems	Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows that could result in localised changes to flows (volume) that would result in form and function changes within aquatic systems, which are currently ephemeral. This then increases the rate of erosions and sedimentation of downstream areas.	2	3	2	2	3	3	36	-	Medium	<ul style="list-style-type: none"> A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. This stormwater control systems must be inspected on an annual basis to ensure these are functional. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil and the re-vegetation of any disturbed riverbanks 	1	1	1	1	1	1	5	-	Low
Terrestrial Ecology																				
Alien Invasive Species	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.	1	1	2	1	3	1	8	-	Low	<ul style="list-style-type: none"> Alien trees and weeds must be removed from the site as per CARA/NEMBA requirements. A suitable weed management strategy to be implemented in construction and operation phases. After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust. 	1	1	2	1	3	1	8	-	Low
Erosion	Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.	1	1	2	1	3	1	8	-	Low	<ul style="list-style-type: none"> Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed. Topsoil must be stripped and stockpiled separately and replaced on completion. If natural vegetation re-establishment does not occur, a suitable grass must be applied. 	1	1	2	1	3	1	8	-	Low
Ecological Processes	Disturbances to ecological processes. Activity may result in disturbances to ecological processes.	1	1	2	1	3	1	8	-	Low	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences. 	1	1	2	1	3	1	8	-	Low
Aquatic and Riparian processes	Aquatic and Riparian processes. Diversion and increased velocity of surface water flows – Changes to the hydrological regime and increased potential for erosion. Impact of changes to water quality. Loss of riparian vegetation / aquatic habitat. Loss of species of special concern.	1	1	2	1	3	1	8	-	Low	<ul style="list-style-type: none"> Suitable structures to be constructed at watercourse crossings that do not alter flows. Stormwater discharge into watercourses to be protected against erosion. 	1	1	2	1	3	1	8	-	Low
Faunal Processes	Disruptions to faunal processes Including barriers to movement and gene dispersal.	1	1	2	1	3	1	8	-	Low	<ul style="list-style-type: none"> The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. 	1	1	2	1	3	1	8	-	Low

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												They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. <ul style="list-style-type: none"> Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A reptile handler should be on call for such circumstances. Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented. 												
Agricultural - none identified																								
Avifauna																								
Bird mortalities	Bird mortalities during the operational phase due to, collisions with infrastructure.	3	3	2	2	2	3	36	-	Medium	Impacts due to bird mortalities during the operational phase are practically unavoidable for any large facility, but with the appropriate mitigation measures these impacts can be minimised. All powerline infrastructure must be fitted with approved bird diverters in order to provide visibility for large-bodied birds.	3	2	1	1	2	2	18	-	Low				
Disruption of bird migratory pathways	Disruption of bird migratory pathways during the operational phase	2	3	2	2	2	3	33	-	Medium	Migratory pathways of birds cannot be changed, and the resulting impacts are unavoidable. However, severity of the impacts can be reduced with appropriate mitigation measures. Some significant discernible migratory flight pathways were able to be established which could be explained by large areas of generic habitats punctuated by some distinguishing geographic features in the landscape, such as large ridges, large impoundments, wetlands and drainage lines. The use of Grid Alternative 1 is imperative to mitigate this impact.	2	2	1	1	2	2	16	-	Low				
The attraction of some novel bird species due to the development of associated infrastructure such as pylons.	The attraction of some novel bird species due to the development of a solar farm with associated infrastructure such as perches, nest and shade opportunities may cause both damage to the infrastructure through acidic defecation by certain species but also draw birds closer to infrastructure and cause significant direct mortality risks.	2	3	2	2	2	2	22	-	Low	Essentially, all habitat attractants should be eliminated so that avifaunal populations will not embed themselves within the infrastructure over time. This includes bird diverters, perch deterrents. All line associated fences should show regular reflective diverters.	3	2	1	1	2	2	18	-	Low				
Geotech																								

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Soil Erosion	Increased erosion due to alteration of natural drainage	1	4	2	2	2	1	11	-	Low	<ul style="list-style-type: none"> Maintain access roads including drainage features. Monitor for erosion and remediate and rehabilitate timeously 	1	2	1	1	2	1	7	-	Low
Social																				
Impacts on water resources	There is no need for water for electricity generation.	1	3	2	2	3	2	22	+	Medium	<ul style="list-style-type: none"> Use dry cooled plants. 	1	2	1	1	2	1	7	+	Low
Cultural Heritage	Location of operations near cultural sites may disrupt cultural practices.	2	3	3	2	2	3	36	-	Medium	<ul style="list-style-type: none"> Locate developments away from cultural heritage sites. 	1	2	2	1	1	2	14	-	Low
Job creation for construction workers.	Increased employment providing skills development and local economic empowerment	2	4	2	2	3	2	26	+	Medium	<ul style="list-style-type: none"> Implement a training and skills development programme for locals. Work closely with the appropriate municipal structures regarding establishing a social responsibility programme 	2	4	2	2	3	2	24	+	Medium
Heritage																				
Impacts to archaeological heritage resources	Operational activities that take place near to archaeological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> A no development buffer of 50m is implemented around sites KS3 and KS4 A no development buffer of 100m is implemented around sites KS6, KS7 and KS8 The area identified as having higher levels of archaeological sensitivity must not be impacted by any development activities. Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low
Impacts to palaeontological resources	Operational activities that take place near to palaeontological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low
Impacts to the cultural landscape	Operational activities that take place near to cultural landscape elements may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the recommendations included in the VIA 	1	1	4	1	4	1	11	-	Low
Visual																				
Altered Sense of Place and Visual Intrusion caused by the Alternative 2 (applicable to Powerline Alternative 2)	Powerline Alternative 2 will be visible to more receptors than Alternative 1. The substation will not be a novel structure in the landscape. The new switching substation will be different to the surrounding area. Both the substation and the switching station will contribute to visual intrusion and visual clutter in the landscape.	2	3	2	2	3	2	24	-	Medium	<ul style="list-style-type: none"> Do not install or affix lights on pylons. 	2	2	2	2	3	2	22	-	Low

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Altered Visual Quality caused by Light Pollution from the Substation at Night (applicable to both powerline alternatives)	The installation of lighting around the substation is anticipated to generate nightglow, altering the sense of place and visual quality to surrounding receptors, especially those (farmstead) receptors not currently exposed to nightglow emanating from Kroonstad.	2	4	1	3	3	3	39	-	Medium	<ul style="list-style-type: none"> Reduce the height of lighting masts to a workable minimum. Direct lighting inwards and downwards to limit light pollution. 	2	3	1	2	3	2	22	-	Low
Altered Visual Quality caused by Light Pollution from the Switching Station at Night (applicable to Powerline Alternative 2)	The installation of lighting around the switching station is anticipated to generate nightglow, altering the sense of place and visual quality to surrounding receptors, especially those (farmstead) receptors not currently exposed to nightglow emanating from Kroonstad.	2	4	1	3	3	3	39	-	Medium	<ul style="list-style-type: none"> Reduce the height of lighting masts to a workable minimum. Direct lighting inwards and downwards to limit light pollution. 	2	3	1	2	3	2	22	-	Low

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Aquatic / Freshwater																				
Impact 1: Loss of aquatic species of special concern during the construction or decommissioning of the grid options	The decommissioning activities will result in the disturbance of aquatic habitats that may contain listed and or protected plant or animal species. However, none of these were observed during this assessment	1	1	1	1	1	1	5	-	Low	<ul style="list-style-type: none"> Develop and implement a Rehabilitation and Monitoring plan post Environmental Authorisation. This must be developed following the finalisation of the tower positions and access tracks and a walk down has been completed. This plan should include relocation of suitable plant species, but more important protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site Where possible, temporary construction lay-down or assembly areas should be sited on transformed areas; and Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re- establishment of plant cover is desirable to prevent erosion. 	1	1	1	1	1	1	5	-	Low
Impact 2: Damage or loss of riparian systems, ephemeral watercourses and wetland systems in the construction or decommissioning of the grid options	Decommissioning could result in the loss of drainage systems that are fully functional and provide an ecosystem service within the site especially where new access roads to install any of the grid options as both alternatives will need to span watercourses with seeps. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example.	2	3	2	2	3	2	24	-	Medium	<ul style="list-style-type: none"> A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout. All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. Where roads and crossings are upgraded, the following applies: etc). It is recommended that no new tracks or towers / pylons are placed / constructed within any of the delineated aquatic zones. 	1	3	2	1	2	2	18	-	Low
Impact 3: Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases	During decommissioning earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the 30 000l fuel storage facility must be given. Although unlikely, consideration must also be provided for the proposed Battery Energy Storage System (BESS), with regard safe handling during the construction phase. This to avoid any spills or leaks from this system.	1	3	2	2	3	3	33	-	Medium	<ul style="list-style-type: none"> All liquid chemicals including fuels and oil, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely. Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment). Mechanical plant and bowzers must not be refuelled or serviced within 100m of a river channel. All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses. Littering and contamination associated with construction activity must be avoided through effective construction camp management. No stockpiling should take place within or near a water course 	1	3	2	1	2	2	18	-	Low

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		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Faunal Processes	Disruptions to faunal processes Including barriers to movement and gene dispersal.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A reptile handler should be on call for such circumstances. Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented. 	1	1	2	2	3	1	9	-	Low
Agricultural - none identified																				
Avifauna																				
Disruption of bird migratory pathways	Disruption of bird migratory pathways during the decommissioning phase of the grid.	3	3	2	2	4	2	28	-	Medium	If the grid is to be decommissioned, decommissioning of powerlines must not commence during the peak wet season migration months on November, December and January.	3	2	2	2	2	2	22	-	Low
Geotech																				
Disturbance/ displacement/ removal of soil and rock	Ground disturbance during access road construction, foundation earthworks, platform earthworks	1	4	2	2	2	1	11	-	Low	<ul style="list-style-type: none"> Restore natural site topography. Landscape and rehabilitate access roads and disturbed areas timeously (e.g., regressing) 	1	4	2	1	2	1	10	-	Low
Soil Erosion	Increased erosion due to vegetation clearing, alteration of natural drainage	1	4	2	2	2	1	11	-	Low	<ul style="list-style-type: none"> Temporary berms and drainage channels to divert surface runoff where needed. Restore natural site topography. Use designated access and laydown areas only to minimise disturbance to surrounding areas 	1	2	1	1	2	1	7	-	Low
Social																				

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The aesthetic value of the land is lost.	Land scarification will occur during the decommissioning of the solar plants.	1	4	2	3	3	3	39	-	Medium	<ul style="list-style-type: none"> Implement rehabilitation, e.g., re-vegetation with indigenous species to prevent dust and erosion, as well as the establishment of alien species. 	1	2	1	2	2	2	16	-	Low
Socio-economic impacts	Job losses	2	4	4	3	3	3	48	-	High	<ul style="list-style-type: none"> Organise labour transfers to areas involved in similar projects. 	2	3	3	2	2	2	24	-	Medium
Heritage																				
Impacts to archaeological heritage resources	Decommissioning activities that take place near to Archaeological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> A no development buffer of 50m is implemented around sites KS3 and KS4 A no development buffer of 100m is implemented around sites KS6, KS7 and KS8 The area identified as having higher levels of archaeological sensitivity must not be impacted by any development activities. Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low
Impacts to palaeontological resources	Decommissioning activities that take place near to Palaeontological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low
Impacts to the cultural landscape	Decommissioning activities that take place near to cultural landscape elements may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the recommendations included in the VIA 	1	1	4	1	4	1	11	-	Low
Visual																				
Altered Sense of Place caused by the Decommissioning Activities (applicable to both powerline alternatives)	Dust generated during decommissioning will be visually unappealing and may detract from the visual quality (and sense of place) of the area. These impacts are typically limited to the immediate area surrounding the site, during the decommissioning period.	2	4	1	2	1	3	30	-	Medium	<ul style="list-style-type: none"> Limit vegetation clearance and the footprint of construction to what is absolutely essential. Avoid excavation, handling and transport of materials which may generate dust under very windy conditions. Keep stockpiled aggregates and sand covered to minimise dust generation. Keep site tidy. 	2	3	1	2	1	2	18	-	Low

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Aquatic / Freshwater																				
Cumulative Impact of various proposed projects and associated grid lines on the natural environment	The cumulative assessment considers the various proposed renewable projects that occur within a 35km radius of this site, where the author has either been involved in the assessment of these projects and or review of the past assessments as part of any required Water Use Licenses	1	1	1	1	1	1	5	-	Low	<ul style="list-style-type: none"> The premise of all the reviewed or assessed projects has been the avoidance of impacts on the Very High Sensitivity environments, which have been achieved by the various proposed layouts. The only remaining impacts will be the crossing of internal roads over minor watercourse / drainage lines or areas rated as LOW sensitivity. 	1	3	2	1	2	2	18	-	Low
Terrestrial Ecology																				
Vegetation	Permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the site. No clearing outside of footprint to take place. Topsoil must be striped and stockpiled separately during site preparation and replaced on completion where revegetation will take place. Any site camps and laydown areas requiring clearing must be located within already disturbed areas away from watercourses. 	1	1	2	2	3	1	9	-	Low
Flora Species	Loss of flora species of special concern during pre-construction site clearing activities. Numerous species of special concern are potentially present within the affected area, which could be destroyed during site preparation.	1	1	2	2	3	1	8	-	Low	<ul style="list-style-type: none"> A flora search and rescue are recommended before commencement. Respective permits to be obtained beforehand. 	1	1	2	2	3	1	9	-	Low
Alien Invasive Species	Susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Alien trees and weeds must be removed from the site as per CARA/NEMBA requirements. A suitable weed management strategy to be implemented in construction and operation phases. After clearing and construction is completed, an appropriate cover may be required, should natural re-establishment of grasses not take place in a timely manner along road verges. This will also minimise dust. 	1	1	2	2	3	1	9	-	Low
Erosion	Susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted once construction is completed. Topsoil must be stripped and stockpiled separately and replaced on completion. If natural vegetation re-establishment does not occur, a suitable grass must be applied. 	1	1	2	2	3	1	9	-	Low
Ecological Processes	Disturbances to ecological processes. Activity may result in disturbances to ecological processes.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the development footprint, and the area to be cleared must be demarcated before any clearing commences. 	1	1	2	2	3	1	9	-	Low
Aquatic and Riparian processes	Aquatic and Riparian processes. Diversion and increased velocity of surface water flows – Changes to the hydrological regime and increased potential for erosion. Impact of changes to water quality. Loss of	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Suitable structures to be constructed at watercourse crossings that do not alter flows. Stormwater discharge into watercourses to be protected against erosion. 	1	1	2	2	3	1	9	-	Low

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	riparian vegetation / aquatic habitat. Loss of species of special concern.																			
Faunal Habitat	Loss of Faunal Habitat: Activity will result in the loss of habitat for faunal species.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> Blanket clearing of vegetation must be limited to the footprint. It is important that clearing activities are kept to the minimum and take place in a phased manner, where applicable. This allows any smaller animal species to move into safe areas and prevents wind and water erosion of the cleared areas. 	1	1	2	2	3	1	9	-	Low
Faunal Processes	Disruptions to faunal processes Including barriers to movement and gene dispersal.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> The habitats and microhabitats present on the project site are not unique and are widespread in the general area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. Small mammals within the habitat on and around the affected area are generally mobile and likely to be transient to the area. They will most likely vacate the area once construction commences. As with all construction sites there is a latent risk that there will be some accidental mortalities. Specific measures are made to reduce this risk. The risk of species of special concern is low, and it is unlikely that there will be any impact to populations of such species because of the activity. Reptiles such as lizards are less mobile compared to mammals, and some mortalities could arise. It is recommended that a faunal search and rescue be conducted before construction commences, although experience has shown that there could still be some mortalities as these species are mobile and may thus move onto site once construction is underway. A reptile handler should be on call for such circumstances. Should any amphibian migrations occur between wetland areas during construction, appropriate measures (including temporarily suspending works in the affected area) should be implemented. 	1	1	2	2	3	1	9	-	Low
Faunal Species	Loss of faunal SSC due to construction activities: Activities associated with bush clearing and ploughing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.	1	1	2	2	3	1	9	-	Low	<ul style="list-style-type: none"> A pre-commencement faunal search and rescue is recommended. Respective permits to be obtained beforehand. No animals are to be harmed or killed during the course of operations. Workers are NOT allowed to snare any faunal species. 	1	1	2	2	3	1	9	-	Low
Agricultural - none identified																				
Avifauna																				
Collision mortality (powerlines)	Increased collision related mortalities due to increased powerlines	3	4	3	2	2	4	56	-	High	<ul style="list-style-type: none"> Saturation of powerline infrastructure with approved bird diverters 	3	2	1	1	2	3	27	-	Medium
Geotech – none identified																				
Social																				

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Visual Impacts	There are several substations and powerlines in the area, already affecting the visual quality and sense of place in this modified rural landscape.	3	4	4	2	3	3	48	-	High	<ul style="list-style-type: none"> The facilities are distant from each other and do not constitute a spatially concentrated, high-density network of PV facilities, which mitigates the visual cumulative impacts. Advise other project owners to implement measures to mitigate the impact of these projects on visual intrusion and altered sense of place, such as screening (vegetation and/or berms) and limit the light pollution generated by these facilities. 	2	3	3	1	3	2	22	-	Low
Heritage																				
Impacts to archaeological heritage resources	Cumulative destruction of significant archaeological heritage	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> A no development buffer of 50m is implemented around sites KS3 and KS4 A no development buffer of 100m is implemented around sites KS6, KS7 and KS8 The area identified as having higher levels of archaeological sensitivity must not be impacted by any development activities. Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low
Impacts to palaeontological resources	Cumulative destruction of significant palaeontological heritage	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low
Impacts to the cultural landscape	Cumulative impact to the cultural landscape	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> Implementation of the recommendations included in the VIA 	1	1	4	1	4	1	11	-	Low
Visual																				
Altered Sense of Place caused by the Grid Connection	There are already numerous substations and powerlines in the region, already affecting visual quality and sense of place in this modified rural landscape. As such, the proposed powerlines, BESS and substations associated with these projects are not the first of their kind in the visual landscape. The Bonsmara PV facility and other proposed facilities listed above have a combined footprint of approximately ~4 705 ha; although large, the facilities are far apart and do not constitute a spatially concentrated, high-density network of PV facilities, which mitigates cumulative impacts.	2	4	2	3	3	2	28	-	Medium	<ul style="list-style-type: none"> Encourage other project owners to implement measures to mitigate impacts of the powerlines and substations on the visual intrusion and altered sense of place, such as no affixing lights to powerlines and routing the powerlines within corridors. 	2	3	2	2	3	2	24	-	Low