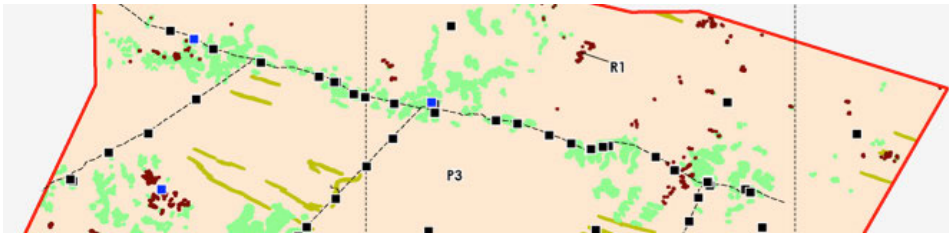
Biota Environmental Sciences

The Asian Renewable Energy Hub

Nyangumartamili wangal pa janyja

Asian Renewable Energy Hub



Response to Submissions on Environmental Review Document

Assessment Number 2140

November 2019

Biota Environmental Sciences

The Asian Renewable Energy Hub
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Asian Renewable Energy Hub – Response to Submissions on Environmental Review Document

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1.0 Introduction

1.1 Background and Purpose of this Document

NW Interconnected Power Pty Ltd ('the proponent') proposes to develop the Asian Renewable Energy Hub ('the proposal'). The proposal is to construct and operate a large-scale wind and solar renewable energy project at a site approximately 220 km east of Port Hedland and 270 km southwest of Broome, in the northwest of Western Australia.

An Environmental Review Document (ERD) was prepared for the proposal in accordance with Part IV of the *Environmental Protection Act 1986* (EP Act). The ERD was issued for public comment over a six-week period commencing 13 May 2019 and closing on 24 June 2019. During this period, government agencies, non-government organisations, stakeholders and members of the public were invited to make submissions to the Environmental Protection Authority (EPA) in regards to the proposal.

Following the end of the public review period, EPA Services within the Department of Water and Environmental Regulation (DWER) collated the submissions received and provided these to the proponent. This document has been prepared by the proponent to provide responses to the summarised submissions received on the ERD.

1.2 Submissions Received

A total of 17 submissions were received by the EPA during or after the six-week comment period, with submissions from:

- Department of Biodiversity, Conservation and Attractions;
- Department of Mines, Industry, Resources and Safety;
- Department of Planning, Lands and Heritage;
- Department of the Environment and Energy;
- Department of Water and Environmental Regulation;
- Economic Regulation Authority;
- Birdlife Western Australia;
- Wilderness Society;
- Western Australian Fishing Industry Council; and
- eight members of the public (personal details kept confidential).

1.3 Related Documents

As sought by some submissions, the proponent has also revised and expanded the Draft Construction Environmental Management Plan (CEMP) for the proposal to include operations matters, as a revised Environmental Management Plan (EMP) for the proposal. The Fire Management and Monitoring Strategy (FMMS) has also been expanded in response to some submission requests regarding methods and monitoring.

1.4 Proponent Responses

The proponent's responses to the summarised points raised in the submissions are provided in the following tables.

Benthic Communities and Habitats

No.	Submitter	Submission and/or issue	Proponent Response to Submission
DWER BCH 1 Prop RtS 4.1	DWER	The proponent has undertaken a single survey to determine the benthic habitat, this survey did not identify any seagrass habitat. From recently published Kimberley Seagrass report (WAMSI project report 2.2.4) https://www.wamsi.org.au/sites/wamsi.org.au/files/Benthic_Primary_Productivity_WAMSI_KMRP_Project_2.2.4_Kendrick_et_al_2017_Final.pdf Seagrasses in the Kimberley often disappear at the beginning of the wet season and re-establish from seed at the beginning of the following dry season (typically Apr-Oct). Additionally, the authors of this study advise that "monitoring might be more effective if conducted several times each year — at least during initial surveys". The presence of marine turtles in moderate abundance along this coastline may indicate the presence of seagrasses at least sometimes of the year. This means that there may be a possibility that seagrass is present at least sometimes in the year and/or with patchy distribution. Any proposed dredging work should be planned assuming that there is potential for seagrass habitat in this area e.g. possibly dredging in wet season and/or taking into account findings from the Dredging Science node (https://www.wamsi.org.au/dredging-science-node). Please confirm the timing of the marine construction works.	The survey of Kendrick et al. (2017) was limited to five sheltered locations surrounding islands offshore of One Arm Point on the Dampier Peninsula that are not comparable in environmental setting to Eighty Mile Beach. Notwithstanding this, the benthic habitat mapping field survey for the current proposal was completed in mid-October 2019, well into the dry season, and prior to the wet season (November–April), when ephemeral seagrass was most likely to be present, without any being recorded. The Eighty Mile Beach Marine Park Management Plan (2014–2024) states that *'intertidal and subtidal zones of Eighty Mile Beach are largely unvegetated, however, macroalgal and seagrass communities are found in the south-west corner of the park [near the Kurtamparanya and Pananykarra Sanctuary Zones]. Seagrass meadows in this area support dugongs, which are regularly seen here.'* As detailed in Appendices 2 and 3 of the ERD, the reason for the lack of vegetation in the development envelope is likely due to the highly exposed coastline and high energy, strongly tidal environment which continually mobilises the sea bed year-round (precluding establishment of seagrass communities) and creates a naturally turbid environment (limiting light availability). The proponent has committed in the ERD and the EMP to cable installation at a timing to avoid the turtle breeding period; and works will be conducted taking into account findings from the Dredging Science node.
DWER BCH 2 Prop RtS 4.2	DWER	The ERD does not address the potential impact of increased sedimentation, which may affect benthic communities (micro-phyto benthos and infauna). Please provide further information on the potential effects of sedimentation. This includes predictions of the intensity, extent and duration of the turbidity plume and in particular, likely sedimentation levels. If modelling is to be undertaken, it is acknowledged that given that the main habitat was sand and no seagrass was observed, the modelling is not required to be highly complex. The predicted levels of sedimentation will provide an indication of the potential impacts to the surrounding environment. Habitat monitoring may be recommended to validate the predictions. Once the predicted levels of sedimentation are available please outline any requirement for post construction monitoring.	The prevailing high energy tidal regime of the region causes a highly mobile sediment bed and naturally turbid coastal waters and precludes the growth of benthic primary producers. Additional turbidity and sediment deposition caused by cable trenching, ploughing or jetting is expected to be localised, temporary and not significant to ecological processes. Trenching, ploughing or jetting activities to install the four cables may result in the temporary disturbance of an area of bioturbated sediments (<1% bioturbated) equivalent to approximately 15.3 ha within the development envelope. This small scale and localised disturbance of bioturbated sediments is not considered to be ecologically significant (BMT 2018a). EPA (2016a) guidance on the assessment of potential BCH impacts recommends the use of a local assessment unit of approximately 50 km (5,000 ha) to assess potential impacts on benthic habitat at an appropriate scale. Direct temporary loss of 15.3 ha of bioturbated bare sand within a nominal 5,000 ha local assessment unit (LAU) equates to a potential disturbance of 0.3% of habitat. The extent of benthic habitats mapped by BMT (2018a) provides an even more precautionary scale of consideration for the potential impact of the cable installation, whereby that 1,380.6 ha mapped extent can be adopted as an LAU. Even at this very localised context, the direct temporary loss of 15.3 ha only represents 1.1% of the local sand-dominated habitat. Noting further that the disturbance will be temporary only, and sediments will likely be rapidly reinstated due to the high energy environment, the impact is not significant (BMT 2018a). Trenching, ploughing or jetting activities will cause reworking and settling out of sediments along the cable route, which may cause temporary, localised changes in particle size distribution (e.g. an increase in the silt and clay fractions) and carbon content (e.g. a lower proportion of organic carbon than natural sediments, which contain microphytobenthos and detritus) (BMT 2018b). Changing the physical and chemical properties of sediment may impact the abundance of macroinvertebrates (Hale and Butcher 2009). However, since the HVDC cables will be completely buried, any temporary and localised changes in particle size distribution and carbon content will not permanently impact the sediment quality of the marine environment, particularly given the influence of tidal flows and naturally mobilised sediment bed (BMT 2018b). The direct temporary loss of 15.3 ha of bioturbated bare sand within the broader context of the 200,000 ha Marine Park represents a very localised and short-term disturbance to <0.01% of the Marine Park by area (Figure 4.2). The potential impact on any unique attributes or any of the ecological characters for which the Eighty Mile Beach Marine Park was established (Hale and Butcher 2009, Department of Parks and Wildlife 2014) is negligible. Post-construction monitoring of microphytobenthos and infauna is therefore not considered to be warranted.

No.	Submitter	Submission and/or issue	Proponent Response to Submission
DWER BCH 3 Prop RtS 4.3	DWER	The ERD states that heat from the cable is unlikely to have any negative impacts on the marine environment, however specific estimates are not provided. More detail is required regarding an estimate of the likely temperature effect above the cables near the seabed surface, assuming a 5 m minimum depth of burial, and any impact this may have on sediment chemistry and infauna.	As described in Appendix 1 of the ERD, the proponent has committed to a management action and target of burial to ensure no seabed surface elevation of temperature; and monitoring of baseline, during and post installation to ensure the management target is met. As stated in the ERD, heat generation was considered a potential impact during the monopole HVDC Basslink subsea cable operation in Bass Strait, Australia (OSPAR Commission 2009). The external surface temperature of the subsea cable was calculated to reach 30–35ºC, and the seabed surface temperature directly overlying the cables was predicted to rise by a few degrees Celsius at a burial depth of 1.2 m (OSPAR Commission 2009). Emeana et al. (2016) experimentally measured thermal regimes surrounding HV cables within typical unconsolidated shelf sediments - coarse silt, fine sand and very coarse sand - and found: "*Coarse silts are shown to be purely conductive, producing temperature increases of >10°C up to 40 cm from the source of 60°C above ambient; fine sands demonstrate a transition from conductive to convective heat transfer between cf. 20 and 36°C above ambient, with >10°C heat increases occurring over a metre from the source of 55°C above ambient; and very coarse sands exhibit dominantly convective heat transfer even at very low (cf. 7°C) operating temperatures and reaching temperatures of up to 18°C above ambient at a metre from the source at surface temperatures of only 18°C.*" The above findings measured temperature increases up to a maximum of 1m from the cable source and showed that >10 ºC heat increases were possible at this distance. Prior to installation, as a CEMP commitment (and a component of the temperature monitoring program), the proponent will undertake Finite Element Method simulations of the steady state heat flow regimes and normalized radial temperature distributions for the operational HV cable specification, to confirm the distance at which no temperature elevation will occur. A conservative buffer will then be applied to this distance and a commitment made to cable burial at a depth that has no heat-derived impact on surface sediment biogeochemistry.
DWER BCH 4 Prop RtS 4.4	DWER	The assessment of the benthic communities and habitat survey has not considered the impacts to Pearl Oyster (*Pinctada maxima*). More information is required on potential impacts of the disturbance of 15.3 ha of seabed will have on Pearl Oysters. The following document defines the spatial distribution, habitat and the biology of pearl oysters – Travaille, K.L., Jones, R. and Wise, B.S. (2016). *Western Australian Marine Stewardship Council Report Series No. 6: Ecosystem-Based Fisheries Management (EBFM) Risk Assessment of the Western Australian Silver-Lipped Pearl Oyster (Pinctada maxima) Industry*. Department of Fisheries. 100pp. is available at the following link: http://www.fish.wa.gov.au/Documents/wamsc_reports/wamsc_report_no_6.pdf.	It is acknowledged that a Pearl Oyster fishery is present in the region. The temporary disturbance of sediment habitat during cable lay is not expected to significantly impact regional Pearl Oyster populations. The proponent contacted the Pearl Producers Association (PPA) as part of the consultation process for the proposal but did not receive a response. The proponent is willing to maintain dialogue and work with the PPA to ensure that cable installation activities do not significantly impact any planned collection of Pearl Oysters (typically via spot diving in water depths of 10 to 20 m). It is noted that the ERD states that the overall risk of marine fauna disturbance (including to Pearl Oysters) from cable laying vessels is low. Cable installation, will be a small-scale, temporary disturbance relative to the regional range of Pearl Oysters, and is unlikely to significantly affect regional populations. Disturbance from installation activities during the approximately one-week installation period per cable along a 5 m corridor are not expected to significantly impact Pearl Oyster populations. Cable installation will avoid the Pearl Oyster spawning period from October to December.

No.	Submitter	Submission and/or issue	Proponent Response to Submission
DWER BCH 5 Prop RtS 4.5	DWER	The EPA factor BCH aligns with the following values identified in the Eighty Mile Beach Marine Park Management Plan: Intertidal sand and mudflat communities (including infauna); • Subtidal filter-feeding communities; Macroalgal and seagrass communities; • Coral reef communities; and • Mangrove communities and saltmarshes. Habitat mapping undertaken by the proponent identified that the main habitat was sand, with increasing bioturbation and sparse filter feeders (<1%) in deeper water areas. There were no macroalgal, seagrass, coral reef, mangrove or saltmarsh communities identified in the subsea cable area. The management objective for these communities identified in the MMP is "*To ensure that intertidal sand, mudflat and subtidal feeding communities are not significantly impacted by human activities in the marine park"*. The long term target identified for these communities is "*No loss of intertidal sand, mudflat and subtidal feeding community diversity or abundance of indicator species* as a result of human activity in the marine park*" (*In this context a loss or change in abundance excludes those of a minor or transient nature). Please provide further information on how the proposal is consistent with the Marine Park management objectives.	The required work in the ESD for the proposal was to *'address potential impacts/implications of the proposal on the management objectives and targets for the marine park values'.* The alignment of the EPA factor BCH with the Marine Park values was conducted in the ERD (p125-126). Specifically, the relevant marine park values are: • Subtidal filter-feeding communities; • Macroalgal and seagrass communities; • Coral reef communities; and • Mangrove communities and saltmarshes. The derivative management objectives for each of these values is to ensure that the relevant communities are not significantly impacted by human activities in the marine park. The ERD demonstrates that there will be no significant impact to: • Subtidal filter-feeding communities; • Macroalgal and seagrass communities; • Coral reef communities; and • Mangrove communities and saltmarshes. The very short-term disturbance of sediment communities by cable installation and burial at depth will be transient in nature, will not present any significant implications for management objectives, and is therefore not inconsistent with the long-term targets identified in the Eighty Mile Beach Marine Park Management Plan. Further, the proposed cable corridor is located within a general use zone of the marine park, which allows for (Department of Parks and Wildlife 2014): • pipeline installation, on assessment; • dredging, on assessment; • marine infrastructure development, on assessment; and • anchoring.

Marine Environmental Quality

No.	Submitter	Proponent Submission Summary	Response to Submission
DWER MEQ 1 Prop RtS 4.6	DWER	While it is likely that there is a low risk of sediment contamination in the development envelope due a lack of development in the area, there may be naturally elevated levels of heavy metals in the sediment, which may be released during the cable installation if there is significant disturbance of the sediments. The Environmental Scoping Document identifies that the proponent needs to present information on baseline data describing marine environmental quality, however, no baseline data are included in the ERD for sediment or water quality. Table 3.2 of the CEMP states that water quality sampling will be undertaken prior and post cable installation. It is recommended that the proponent also collect baseline data on sediment quality, to the expected depth of disturbance where sediments are likely to mix with the water column, so that the potential risks and impacts can be assessed well before cable installation. If elevated levels of contaminants are detected in the sediment, then elutriate testing may need to be undertaken to determine the bioavailability in the water column. It is also noted that risks associated with any sediment plumes cannot be evaluated without understanding baseline sediment quality. Please confirm the approach for determining sediment quality and how the risks of sediment plumes will be evaluated.	The proponent agrees to collect baseline data on sediment quality and assess risks of contaminant release during sediment disturbance, generally in line with the National Assessment Guidelines for Dredging (Australian Government 2009), and in consultation with DWER.
DWER MEQ 2 Prop RtS 4.7	DWER	The ERD predicts that the increases in turbidity from the installation of cables will have a low impact. Further information on the effects on turbidity should be provided in order to make an informed assessment on the potential impacts to the surrounding area. Please provide predictions of the intensity, extent and duration of the plume. If modelling is to be undertaken, it is acknowledged that given that the main habitat was identified as sand and no seagrass was observed, any modelling is not required to be highly complex.	As stated in Section 2.6.11.3 of the ERD, the cable installation period is approximately one week per cable. A hydro-plough or equivalent low impact installation technique will be used to bury the cable to the required depth (expected to be 5-10 m below seabed), in a disturbance area up to 5 m wide, to the edge of State Waters (approximately three nautical miles from the lowest astronomical tide). A single cable installation vessel would be used. Of the four cables to be laid, no more than two would be laid in the same year. The generation of turbidity during cable installation is considered not to be ecologically significant nor is modelling considered necessary due to the: • short duration of sediment disturbance • naturally high turbidity of the local high-energy tidal environment; and • lack of significant benthic habitat in the region.

No.	Submitter	Proponent Submission Summary	Response to Submission
DWER MEQ 3 Prop RtS 4.8	DWER	The ERD and CEMP only briefly address the issue of hydrocarbon spills and waste generation. The CEMP states “Industry standard housekeeping and spill prevention protocols detailed and contractually required” and that this will be the responsibility of the vessel contractor. It is recommended the proponent prepare an oil spill response plan, in consultation with the Department of Mines and Industry Regulation Safety and the Department of Transport, which commits to appropriate monitoring, spill prevention and response measures.	The proponent agrees to this recommendation.
DWER MEQ 4 Prop RtS 4.9	DWER	The EPA factor MEQ aligns with the value “Water and sediment quality” in the Eighty Mile Marine Park Management Plan: The management objective for water quality and sediment identified in the Marine Park Plan is “*To ensure the water and sediment quality is not significantly impacted by human activities in the marine park*”. The target for this objective is “*No change in water or sediment quality beyond natural background levels as a result of human activity in the marine park, except for designated areas where a different level of acceptable change is approved by the appropriate government regulatory authority*”. Please provide further information on how the proposal is consistent with the Marine Park management objectives	The required work in the ESD for the proposal was to ‘address potential impacts/implications of the proposal on the management objectives and targets for the marine park values. The alignment of the EPA factor MEQ with the Marine Park values was conducted in the ERD (p125-126). Specifically, the relevant marine park value is “water and sediment quality” with the derivative management objective to ensure the water and sediment quality is not significantly impacted by human activities in the marine park. The ERD demonstrates that there will be no significant impact on water and sediment quality in the marine park. The very short-term disturbance of sediments by cable installation and burial at depth will be transient in nature, will not present any significant implications for management objectives, and is therefore not inconsistent with the long-term targets identified in the Eighty Mile Beach Marine Park Management Plan. Further, the proposed cable corridor is located within a general use zone of the marine park, which allows for (Department of Parks and Wildlife 2014): • pipeline installation, on assessment • dredging, on assessment • marine infrastructure development, on assessment • anchoring.
DWER MEQ 5 Prop RtS 4.10	DWER	The proposal provides only a brief description of the subsea cable installation. Please provide the following additional information: What is the width of the corridor which the cables will be installed and what is the configuration of the cable layout? Will it be four sets of cables laid immediately adjacent to each other? What type of vessel will pull the hydroplough – will it be anchored to the seabed, or will it be dynamically positioned. Further details of the hydroplough methodology, including sediment displacement, potential for Acid Sulphide sediment disturbance is required More precise information on the length of time to install the cable to the limit of State Waters.	Please refer to Section 2.6.11.3 and Appendix 3 of the ERD for the description of cable installation available at this stage of project definition, which state: • The cables will be placed up to 50 m apart, and the cable corridor (for all four cables together) will be 200 m wide to allow for a 25 m buffer either side of each cable • Each cable will directly disturb a 5 m corridor of sediment (i.e. the envelope of direct disturbance). • The cables will be buried for the entire route. Burial will primarily be via jetting, hydroploughing or trenching 5-10 m below seabed surface level (the support vessel may use either dynamic positioning or anchoring to obtain stability during cable burial). • Using a specialist cable laying vessel, the cables will be installed one after the other. A hydro-plough or equivalent low impact installation technique will be used to bury the cable to the required depth (5-10 m below seabed). • In the case of cables going to Port Hedland or Dampier it is possible that two cables might be installed in a given season. For export to Southeast Asia, each cable would be laid 2-3 years apart. • Of the four cables to be laid, no more than two would be laid in the same year • The cable installation period per cable is approximately one week.
DWER MEQ 6 Prop RtS 9.1	WAFIC	Please provide further information on the timeframe for building the marine cable in both State and Commonwealth Waters. How long will there be increased turbidity in the water column? What is the anticipated volume of sediment contaminants etc.?	Please refer to response to (Prop RtS) Items 4.7 and 4.10 above.

Marine Fauna

No.	Submitter	Submission and/or Issue	Response to Submission
DWER Marine Fauna 1 Prop RtS 4.11	DWER	It is noted that disturbance may occur from vessel movements during cable installation. In regards to: Sawfish The peak period of pupping for sawfish is between January to May, and the ERD states that disturbance will be minimised by undertaking cable installation outside of this season. However, in section 4.5.6.1 specifies that installation, maintenance and decommissioning of cables will only occur during the period April to July. This is not outside of the breeding season and there is currently a two month overlap with the pupping period. To minimise potential impacts to sawfish pups it is recommended that cable installation occurs between June and December. Pearl Oysters (*Pinctada maxima*) The primary spawning for time for Pearl Oysters occurs from the missile of October through to December, with a secondary smaller spawning event in February and March. These key events should be considered in the cable installation timing.	It is noted that the ERD states that he overall risk of marine fauna disturbance from cable laying vessels is low. Cable installation, maintenance and decommissioning will be a small-scale, temporary disturbance relative to the range of the marine fauna that may potentially occur, and is unlikely to significantly affect regional populations. There will be no risk of marine fauna entanglement or entrainment with the cables once they are operational, as they will be buried 5-10 m below the seabed. Marine fauna observation and avoidance management measures will still be implemented as part of the CEMP to ensure vessel strikes or entanglement of marine fauna are avoided. Disturbance from vessel movements during the approximately one-week installation period per cable along a 5 m corridor are not expected to significantly impact Sawfish populations. As stated in Appendix 1 of the ERD, cable installation will avoid the Sawfish pupping period from January to May (and the peak turtle breeding period from November to January). It is acknowledged that a Pearl Oyster fishery is present in the region. The temporary disturbance of sediment habitat during cable lay is not expected to significantly impact regional Pearl Oyster populations. The proponent contacted the Pearl Producers Association (PPA) as part of the consultation process for the proposal but did not receive a response. The proponent is willing to maintain dialogue and work with the PPA to ensure that cable installation activities do not significantly impact any planned collection of Pearl Oysters (typically via spot diving in water depths of 10 to 20m). Cable installation will avoid the Pearl Oyster spawning period from October to December. The proponent corrects the text in Section 4.5.6.1 of the ERD to: "*The CEMP will specify that installation, maintenance and decommissioning of cables will only occur during the period June to September...*"
DWER Marine Fauna 2 Prop RtS 4.12	DWER	More information is required on electromagnetic field (EMF) generation and residual levels at the seabed surface. A better description of the monopolar and bipolar systems proposed to be used is required, in addition to modelling and cable shielding requirements. Please provide further details on the predicted levels of EMF, and how these compare to the sensitivities of marine species including marine mammals, sea turtles, fishes (including elasmobranches) and invertebrates. In particular the sensitivity of sawfish, which have fine electromagnetic sensors, needs to be considered.	The ERD discussed monopolar and bipolar systems in Sections 4.4.5.4 and 4.5.5.4 of the ERD, including the range at which monopolar HVDC cables produce behavioural responses in elasmobranchs (a few metres; p121 of the ERD) and that bipolar cables produce a smaller field. Shielding specifications were already provided in Appendix 4 of the ERD. With this shielding, and the primary mitigation of burial of the cable 5-10 m below the seabed (consistent with best global practice as cited in the ERD), the predicted level of EMF at the seabed will be negligible. As the strength of both magnetic and electric fields rapidly declines as a function of distance from the cable, exposure of marine species to EMF can be eliminated by cable shielding and burial to adequate depths (OSPAR Commission 2009). As stated in Appendix 1 of the ERD, the proponent has also committed to: • a management action and target of cable shielding and burial to ensure negligible EMF generation at the seabed surface; • an EMF modelling report; and • EMF verification monitoring and reporting to ensure the management target is met. Similar to the approach to avoid heat-derived impacts, prior to installation, as a CEMP commitment (and a component of the temperature monitoring program), the proponent will undertake simulations of the steady state radial EMF distributions for the operational HV cable specification, to confirm the distance at which no significant difference to background will occur. A conservative buffer will then be applied to this distance and a commitment made to cable burial at a depth that has no EMF-derived impact on marine fauna, including sawfish.
DWER Marine Fauna 4 Prop RtS 4.13	DWER	Immobile invertebrates (such as Pearl Oysters) are more susceptible to noise and are not able to move out of the way of moving vessels. Please provide a brief discussion of how this has been considered.	It is acknowledged that a Pearl Oyster fishery is present in the region. The temporary disturbance of vessel noise during cable lay over a period of approximately one week per cable is not expected to significantly impact regional Pearl Oyster populations.

No.	Submitter	Submission and/or Issue	Response to Submission
DWER Marine Fauna 5 Prop RtS 4.14	DWER	The EPA factor Marine Fauna aligns with the following values identified in the Eighty Mile Beach Marine Park Management Plan: Marine turtles; Marine mammals; Macro invertebrates; Scalefish; and Sharks and rays. The management objectives are slightly varied for the different groups: *For marine turtles and marine mammals the objective is to ensure these species are not significantly impacted by human activities in the marine park.* *For macro invertebrates, scalefish, sharks and rays the objective is to ensure that non targeted species are not significantly impacted by human activities and for targeted species to ensure that they are managed for ecological sustainability.* There are several long term targets identified for these communities identified in the MMP which are summarised below: *No loss of abundance or significant disturbance of nesting turtles or breeding success as a result of human activity.* *No loss of dugong abundance or change in distribution as a result of human activity or loss of cetacean diversity and abundance as a result of human activity.* *No loss of cetacean diversity or abundance as a result of human activity in the marine park.* *Management targets for macro invertebrates, scalefish, sharks and rays to be determined in consultation with Fisheries.* Please provide further information on how the proposal is consistent with the Marine Park management objectives.	This alignment of the EPA factor with the Marine Park values was already conducted in the ERD (p125-126). As already set out in detail in the ERD, the temporary disturbance of marine fauna by cable installation over approximately one week per cable will be transient in nature, managed to ensure no loss of abundance, and is therefore not inconsistent with the long-term targets identified in the Eighty Mile Beach Marine Park Management Plan.
DWER Marine Fauna 6 Prop RtS 9.4	WAFIC	80 Mile Beach is the last remaining wild catch pearl oyster fishery in the world. 15.3 ha of seabed, 18 km of cable used in 6 km tract which will be 2 km wide needs significant assessment and review. This should be done concurrent with the extended proposal including Commonwealth waters.	The submission grossly overstates the area and nature of disturbance. It is acknowledged that a Pearl Oyster fishery is present in the region. The temporary disturbance of sediment habitat during cable lay (approximately one week per cable, along a 5 m corridor) is not expected to significantly impact regional Pearl Oyster populations. The proponent contacted the Pearl Producers Association (PPA) as part of the consultation process for the proposal but did not receive a response. The proponent is willing to maintain dialogue and work with the PPA (and/or WAFIC) to ensure that cable installation activities do not significantly impact any planned collection of Pearl Oysters (typically via spot diving in water depths of 10 to 20 m).

Flora and Vegetation

No.	Submitter	Submission and/or issue	Response to Submission
DWER F&V 1 Prop RtS 4.15	DWER	The nature of the project is such that survey should have been undertaken as though for linear infrastructure, rather than attempting to survey the entire 662,400 ha development envelope. It was acknowledged in the flora and vegetation report that survey effort was a limitation. The flora and vegetation report states amongst its limitations (p. 24) that "local level information is considered to be a limited factor for the survey" and that "intensity of flora survey work is a key limitation." Flora and vegetation surveys do not meet the requirements of the Environmental Scoping Document. In particular, the requirements for surveys within proposed areas of terrestrial disturbance, clearing and areas of potential indirect impacts. Quadrats were placed primarily along existing, rather than proposed, infrastructure corridors. There is therefore a lack of confidence that the flora and vegetation likely to be impacted by the proposal has been adequately characterised. The ERD acknowledges the requirement for targeted surveys to take place to inform detailed design (pp. 146, 150 of the ERD). Please confirm the approach, timing, and management and mitigation actions to ensure adequate flora and vegetation data will be used to inform proposal design and to ensure the EPA's objective for Flora and Vegetation will be met.	The survey design was appropriate to the nature of the habitats present in the development envelope, which have limited diversity over the survey extent, and also considered that the development envelope approvals inherent in current Ministerial Statements provision for flexibility in final design within conditioned requirements. Adopting a linear infrastructure approach would not have been consistent with this as that would have unduly focused effort on specific track alignments and turbine pad locations, which are currently conceptual and representative only, rather than – more appropriately – determining the full range of landform and vegetation units present across the development envelope, and then designing a programme where these were adequately systematically sampled at replicated sites. That approach maximised the sampling adequacy with which the overall diversity of the development envelope was characterised, which was the objective of the ESD requirement, and also ensured surveys representatively considered the range of vegetation types in the full extent of the development envelope, as expected by the EPA. Focusing on a linear approach along conceptual track alignments would not have necessarily achieved this. In many cases, the sampling sites actually were located such that they coincided with conceptual design of the proposal in any event (see Figure 1.1), and thereby still met the joint outcomes of systematic sampling within the proposed areas of terrestrial disturbance (as they currently stand in conceptual design), but more importantly: met the overarching survey objective of ensuring that all vegetation types represented in the development envelope were sampled. This is borne out by the number of quadrats relatively to vegetation types in the completed survey: 99 quadrats were completed for the 9 vegetation types present, with some vegetation types sampled by 15 or more quadrats distributed across the development envelope. This significantly exceeds the sampling effort suggested for each vegetation type by EPA Guidance at 3 quadrats per vegetation type (EPA 2016b). Given these considerations, the proponent does not agree that there is a lack of confidence in the characterisation of the flora and vegetation that may be impacted by the proposal. On the contrary, it is likely that expending additional effort within the vegetation types would have only added incrementally to the documented list of flora taxa for the development envelope. The small risk that any species or new vegetation types that are of conservation significance may have been missed, but would ultimately be within the final clearing footprint, was already recognised in the ERD as this submission notes, with commitment to pre-clearance confirmation surveys. The approach, timing and mitigation actions that this submission requests were also set out in in multiple places in the ERD (p29, 150, 234-235 and 246, and Appendix 1 of the ERD). To reiterate in brief: this constitutes targeted surveys for flora of conservation significance once final design is complete, with the mitigation action being the top of the hierarchy via avoidance through design modification prior to construction.
DWER F&V 2 Prop RtS 4.16	DWER	In regards to flora species: The current footprint does not directly impact upon any known locations of the Priority 1 species *Seringia exastia* (or collections of Seringia that could not be identified to species level) or the location of the Priority 1 taxon *Tephrosia rosea sp*. Port Hedland. The mitigation measures on p. 150 of the ERD state that further targeted survey will take place in the detailed design phase and that direct impact on all locations of these species will be avoided. The ERD does not quantify the impacts on the seven Priority 3 species identified through the flora survey, so impact assessment on these species is not possible. The mitigation measures on p. 150 of the ERD state that further targeted survey will take place in the detailed design phase and that direct impact on all locations of these species will be avoided where possible. Table 6.4 of the Flora and Vegetation survey report lists five taxa that warrant further resolution. The ERD does not include reference to these taxa or information on whether or not they are likely to be impacted upon by the proposal. Please confirm the approach, timing, and management and mitigation actions to ensure adequate flora and vegetation data will be used to inform proposal design and to ensure the EPA's objective for Flora and Vegetation will be met.	The proponent notes that *Seringia exastia* is actually listed as Threatened, not Priority 1, but agrees that the current conceptual design does not impact on the known populations of either that species or *Tephrosia rosea* sp. Port Hedland, and that the mitigation measures committed to are as reiterated in this submission. However, since the release of the ERD, it has been confirmed with Dr Carol Wilkins (the taxonomist who described *Seringia exastia*) that a paper has been accepted for publication that synonymises this species with the widespread and not threatened *S. elliptica*, with *S. exastia* remaining the widespread species' name, as it was the first described (C. Wilkins, DBCA, pers. comm. 2019). This will mean that *S. exastia* will no longer be a threatened species, and not of conservation significance, and any clearing impacts will no longer require mitigation through project design. Regarding the Priority 3 taxa, as detailed in Section 6.2 of Appendix 5 of the ERD, all seven species are, on the basis of recent survey data, far more widespread and commonly collected than previously thought when initially listed as Priority flora (this is also summarised on p148-149 of the ERD itself). An illustrative example is *Bonamia oblongifolia* (Priority 3), which as Appendix 5 details, has been recorded from locations spanning more than 460 km, including a recent new population estimated at over a million plants, suggesting it probably does not warrant continued listing as a Priority species. *Seringia katatona* (Priority 3) also now has records covering a similar extent from numerous new locations, including populations of thousands of plants, and even the original description notes: *'given the extent of unexplored suitable habitat among the [then] known localities, the species is most likely not under threat…*' (see Appendix 4 of the ERD). Given this wider context for the Priority 3 species, that the new development envelope records are additional to the previously known ones, and that the final design will be modified where practicable to avoid impacts anyway, quantification of local impacts is not necessary to be able to conclude that the regional conservation status of these species would not be altered by the proposal.

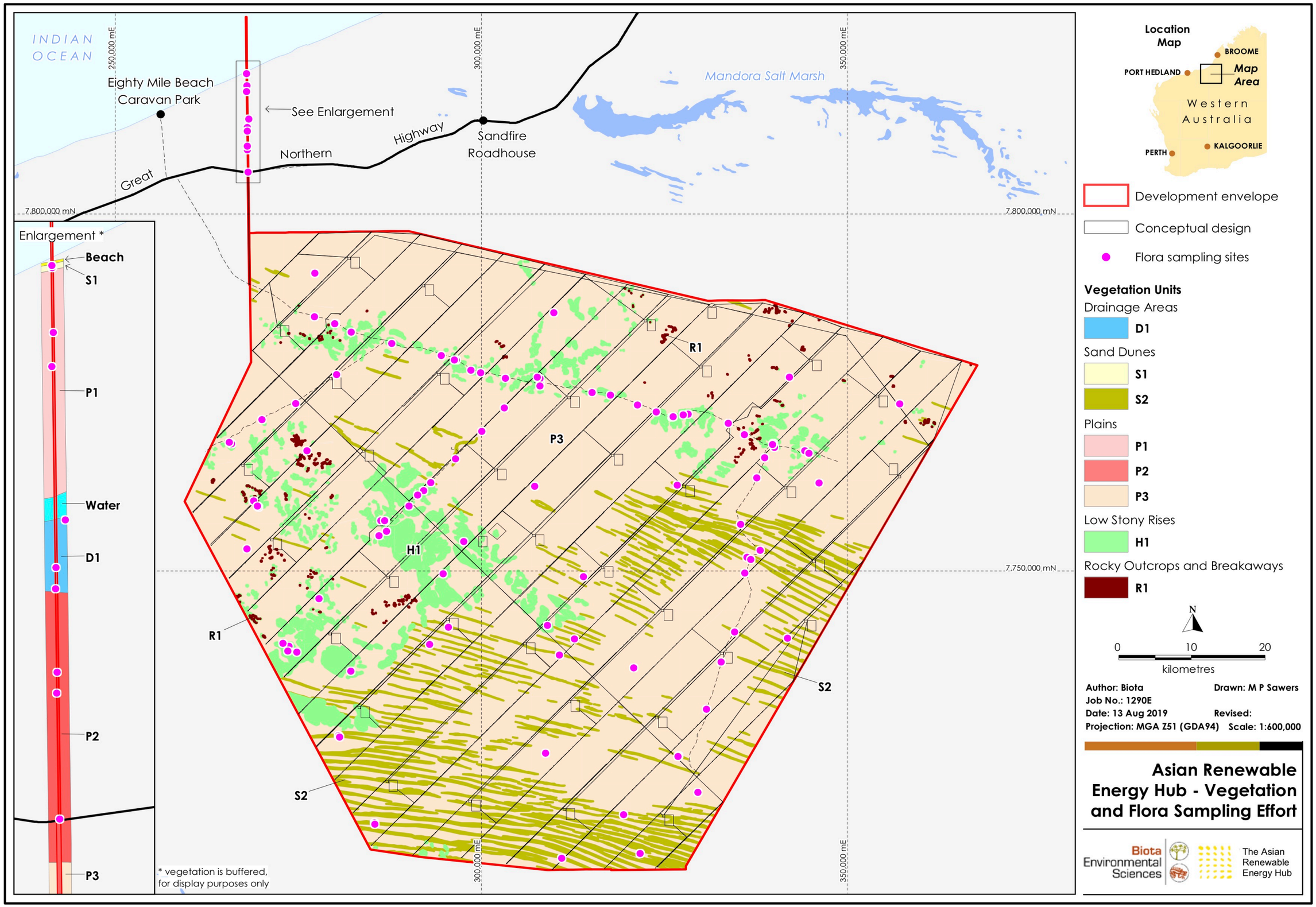


Figure 1.1: Locations of all types of flora sampling sites relative to the range of vegetation types present within the development envelope and the conceptual design clearing footprint.

No.	Submitter	Submission and/or issue	Response to Submission
DWER F&V 5 Prop RtS 4.17	DWER	Indirect impacts have not been adequately assessed as the biggest threat to flora and vegetation from the proposal is likely to be the introduction and spread of environmental weeds. It is noted that the ERD states that well-established management measures will be implemented for all aspects of the construction and operation of the project to mitigate the risk of weed introduction and spread. A Construction and Operational Environmental Management Plan is required to provide confidence that the scale and extent of environmental weed management activities has been adequately considered, planned for and will be resourced for both construction and the operational life of the project.	Beyond the introduction and spread of weeds, which was actually identified and assessed in the ERD, it is unclear what other indirect impacts are referred to, when the only one specified in the submission is weed introduction? The proponent therefore does not agree that *'Indirect impacts have not been adequately assessed'*. It was actually due to the surveys completed for the proposal that the largely weed-free status of the main development was identified, and the ERD more than adequately recognises this as a key potential impact in numerous locations (see p29, 37-39, 131, 141, 146, 149-151, 196 and 198-199 of the ERD, in addition to Appendix 1 of the ERD). The CEMP for the project has been revised to an EMP, including weed management and monitoring measures. In summary, these will comprise: 1. Creation and use of formalised clean down points prior to plant and vehicles entering site. 2. Inspection and sign-off protocols by project environmental staff prior to equipment accessing the site. 3. preferentially sourcing materials from within the development envelope or from certified weed-free sources if externally sourced. 4. Annual monitoring and control program to eliminate any weed recruits, following current DPIRD recommended control protocols.
DWER F&V 6 Prop RtS 4.18	DWER	The Fire Management and Monitoring Strategy (FMMS) is not sufficient to provide confidence that the project's fire management activities will result in a benefit to the flora and vegetation of the project area. There is considerable uncertainty about methods, outcomes and goals to provide confidence in the use of fire as a mitigation measure. Page 29 of the ERD states that "The proposal will include the design and implementation of a biodiversity monitoring program to provide continuous feedback to fire management for long-term maintenance of biodiversity and infrastructure protection." More information should be provided to give confidence that the goals of biodiversity protection and infrastructure protection are compatible. The flora and vegetation monitoring section of the FMMS (Section 6.2) is two short paragraphs stating that monitoring is important and will be done. No information is provided as to how the monitoring will be done and how it will inform management. It should be noted that adequate local-scale vegetation mapping would be required to develop and implement an appropriate fire management program. There remain substantial questions regarding the FMMS that need to be specifically addressed. For example: • How will areas be managed to maintain vegetation with a range of fire history (year since last burnt)? • How frequent will prescribed burns be during the operational phase? • What is the size of the areas in figure 4.2? • Will smaller areas between tracks be used to create multiple time since fire areas? • Will any areas be allowed to get >10 years old? Please prepare a Fire Management and Monitoring Plan, consistent with the EPA's guidance and using management-based outcomes. This plan should be prepared in consultation with relevant experts from Department of Biodiversity, Conservation and Attractions and also address bilbies, as discussed in the Terrestrial Fauna section.	A revised Fire Management and Monitoring Strategy has been prepared, providing expanded detail on objectives, methods and monitoring. That aside however, anyone who spends time in the development envelope and surrounding locality will recognise that addressing the current unmanaged fire regime of very hot, too frequent and extensive fires will clearly represent *'a benefit to the flora and vegetation of the project area',* even without some of the additional fire management methods and monitoring detail requested here. There is considerable evidence in the literature that fire regimes like that currently prevailing onsite result in lowered landscape diversity and resilience, and homogenise the landscape into extensive areas of early seral-stage vegetation (e.g. Casson and Fox 1987, Burrows and Christensen 1991, Bradstock et al. 2012). Traverses of the development envelope clearly exemplify this, with extensive areas of sandplain with very small Triodia hummocks, burnt remains of Acacia shrubs with sparse epicormic regeneration, and generally lowered floristic diversity. While vegetation mapping is useful, floristic data from quadrats will actually be the primary metric used to track the progress of individual portions of managed blocks over time post-fire, including relating this to faunal assemblage data and reference date from other fire ages in multivariate analyses. The other specific questions are addressed in the revised Fire Management and Monitoring Strategy. Lastly, on the request to develop approaches in consultation with relevant experts from DBCA: this has in effect already commenced, and is continuing. The lead author of this Fire Management and Monitoring Strategy was Dr Peter Kendrick, who until recently was DBCA's Senior Reserves Officer on Barrow Island Nature Reserve (2010-2018) and previously DBCA Pilbara Regional Ecologist / Nature Conservation Leader (1989-2010), where he was regularly involved in fire management and recovery monitoring. Dr Kendrick is also involved in indigenous land management programs in the Pilbara and western deserts. Dr Martin Dzminski, a DBCA wildlife biologist and specialist on Bilby ecology, was also consulted in the development of the fire strategy. Finally, Mr Roger Armstrong, now independently contracting but previously DBCA's Principal Fire Planner, Senior Environmental Manager and District and Section Manager (1981-2017) has participated in preliminary discussions, drafting of fire prescriptions, and has agreed to participating in future planning and implementation phases of the fire management program. The proponent has already committed to consulting with and involving DBCA in the ongoing development and implementation of fire management on the site and reiterates this commitment. In addition, the Nyangumarta Rangers have already commenced trials of prescribed burning on the site and they will also be involved in the deployment of fire management on the site, to draw on their experience and engage with the traditional owners of the land, again as documented in the Fire Management and Monitoring Strategy.
DWER F&V 8 Prop RtS 5.1	DoEE	Surveys indicate that the listed critically endangered Fringed Fire-bush occurs within the project area in several locations. Given *the Approved Conservation Advice for Keraudrenia exastia (Fringed Keraudrenia) states that "the species' response to disturbance (e.g. fire and slashing)"* is a relevant impact of threatening processes and constitutes a research priority, the Department understands that the impact of fire on the species is not well understood. Therefore, the impact (positive or negative) of the proposed FMMS on this species is uncertain and warrants further investigation prior to implementation. Further justification is required to demonstrate that the FMMS is suitable for the Fringed Fire-bush.	The proponent notes that the species now actually belongs to the genus *Seringia*, not *Keraudrenia* as in this submission, which has been the case since 2016. Secondly, recent consultation with Dr Carol Wilkins, the taxonomist who original described the species, has indicated that a paper, which will synonymise the species with the widespread *S. elliptica*, will shortly be published (as set out in response to Item 4.16 above). No further justification therefore needs to be provided as the species will no longer be threatened but widespread, and it will therefore not meet the criteria to be listed as Critically Endangered as a Matter of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999*.

Landforms

No.	Submitter	Submission and/or issue	Response to Submission
DWER Landforms 1 Prop RtS 2.3	DMIRS and DWER	A large portion of the project is dominated by a system of stable and vegetated east/west trending sand dunes that vary between 5-30 metres high. The project location has been chosen in part for its favourable high average wind speed characteristics to maximise the output from the proposed wind turbine arrays (section 2.3.3.4, p72 and Figure 2.16). Nowhere in the ERD section 4.6.4 (Potential Impacts on Flora and Vegetation) is the potential for increased wind erosion and sand dune mobilisation resulting from the project development mentioned. DMIRS has to-date not seen large scale dune blow outs/mobilisation as a result of track construction activities in the Great Sandy Desert and Little Sandy Desert associated mining and mineral exploration projects. However smaller wind erosion related impacts have been regularly noticed, as have the difficulties in rehabilitating sand dunes that have been trenched for gas pipeline construction projects. Please provide further information on the potential increased wind erosion and sand dune mobilisation that may result should the proposal be implemented. Please include potential mitigation and management measures as appropriate.	This issue was raised during consultation with DWER during the course of the assessment and was responded to directly with the Department rather than being documented in the ERD: the proponent acknowledges that erosion of exposed sand dunes on works area margins is a potential issue associated with construction of the track network. The advice previously provided to DWER in this respect, which is now included in the revised EMP, is that surface stabilisation treatments will be applied where required on the boundary of the works areas to manage erosion. Erosion control, revegetation and dune stabilisation measures will be implemented in all locations where civil works intersect dune habitat. Post-construction monitoring will also be conducted in stabilised interface areas, and remedial actions will be carried out where required will also be implemented. Given the likely small and localised nature of any blowouts or erosion – as noted in this submission – this mitigation is considered adequate.
DWER Landforms 1 Prop RtS 2.4	DMIRS	The proposal fails to take into account the difficulties in negotiating a path around the east/west oriented sand dunes system located in the southern and eastern parts of the project. The sand dunes are shown as vegetation type S2 in Figure 4.25 and the predicted infrastructure locations shown in grey. Approximately 404 ha of that vegetation type S2 is proposed to be permanently cleared as a result of this proposal (Table 4.9 of ERD). The environmental impact is not so much about the proposed clearing of the vegetation type that is very widespread, but more about the potential to mobilise the dunes and/or create localised wind erosion impacts that are typically difficult to address successfully. It is extremely likely that the proposed track clearing footprint will increase substantially to allow for access between sand dune using the existing swales and breaks in between sand dunes. The documentation needs to consider how the location of the proposed infrastructure (wind turbines, solar farms and associated tracks and power lines) will be optimised to avoid disturbance to sand dunes. Please provide further information on the process for determining the location of the access tracks, which considers the mitigation hierarchy in relation to the potential impacts on the sand dunes. Please also reconsider whether the development footprint needs to increase to take into account these issues. If it is determined that disturbances to the sand dunes be necessary, the Construction and Operational Environmental Management Plan needs to include measures that will be undertaken to minimise impacts and where impacts are unavoidable, how disturbances will be rehabilitated/managed to stabilise the affected sand dunes. The Construction and Operational Environmental Management Plan is to also include details regarding vegetation re-establishment, including management actions, monitoring procedures and the process to identify new eroded areas.	The proposal did actually take this into account: as per the conceptual design and assessments undertaken onsite by civil engineers experienced in wind farm construction, the intention is to construct the track access network as set out in the conceptual design, with only minor local modifications to capitalise on natural landform breaks where minimal design refinement is needed. That approach will result in the minimal disturbance to the east/west linear dunes, with the tracks intersecting them in very short crossing points, largely at the perpendicular, reducing potential impacts on dune landforms as called for in this submission. As set out in Item Prop RtS 2.3 immediately above, the boundaries of all such intersection points will be subject to stabilisation treatments and monitored to ensure this is effective, with additional remediation conducted in any locations where this is not the case. The proponent does not intend to *'negotiate a path around the east/west oriented sand dunes'*, in part for the reason identified in this submission point: that doing so would significantly increase the proposal's vegetation clearing footprint, which would also increase the construction capital cost, and post-construction monitoring and closure requirements.

Terrestrial Fauna

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 1 Prop RtS 2.1	DMIRS	The Winu Copper/Gold prospect, located approximately 36 kms from the south east boundary of the AREH project, is owned by Rio Tinto Exploration (RTX) and is currently being actively explored. While RTX and the Winu project are not listed in the stakeholder consultation section, interaction is likely to occur between the two projects. Some synergies may eventuate with respect to the proposed infrastructure should both projects go ahead. RTX have recently applied for a miscellaneous license (pending L45/491) over the Nyangumarta Highway with a view to upgrading the access track to improve access to the Winu prospect. The area pegged includes the rock outcrops that have been identified as essential habitat for a population of Black Footed Rock Wallabies (figure 4.26, p183 of the ERD). It would be advisable for NW Interconnected to liaise with RTX regarding the access tracks location in areas identified in the AREH proposal to be avoided due to black footed rock wallaby habitat. Please include the outcomes of this consultation as part of the Response to Submissions and the approach to ensure that the population of black footed rock wallaby will be protected.	The proponent is aware of the Winu prospect and is in regular consultation with Rio Tinto Exploration (RTX) in regards to access and any synergies between the proposals. This includes the potential changes to the existing access track, however any works that are completed by RTX ahead of the implementation of the proposal are not the responsibility of the proponent. The proponent will, however, ensure that RTX are apprised of the presence of the Black-footed Rock Wallaby colony and habitats identified through the surveys that it commissioned for this proposal. A data sharing agreement has already been reached between the two proponents to inform and benefit the environmental management of both projects.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 2 Prop RtS 2.2	DMIRS	Some of the material removed to allow for the turbine foundations will be replaced by concrete and the environmental impacts tied to the sourcing of the required aggregate for that project are not considered in the document reviewed. Whether the material would be sourced locally has not been addressed in the documentation. Any local quarrying of the material needs to consider the potential impacts to the newly discovered Rock Wallaby population considerations that have been raised in the documentation. Above ground rock outcrops would usually be targeted for quarrying but in this instance, some of the outcrops located in the project area are very likely essential habitat for the Rock Wallaby population. Please provide further information on the sourcing of material and how this will be managed to avoid disturbance to Rock Wallaby habitat.	The proponent has committed to not disturbing rock piles that represent core habitat for the Black-footed Rock Wallaby. Concrete materials will primarily be the subject of commercial arrangements and will be sourced from suppliers who have their own approvals for extraction. In the event that any local aggregate is sourced, this will most likely be obtained from the very open laterite exposures that represent low and structurally simple habitats with minimal values to terrestrial fauna. No rock piles will be used for materials sourcing for aggregate.
DWER TF 5 Prop RtS 2.8	DMIRS	The Great Sandy Desert environment is generally seen as an arid line of defence to prevent the spread of cane toads further south. The project location and resources that are required for the implementation/operation (turkeys nest for water supply/dust suppression/concrete batching) may help facilitate the spread of cane toads from the Kimberley to the Pilbara. The document does not mention this potential risk and whether it requires specific management. Please include consideration of whether the proposal poses any risk for the spread of cane toad movement, and if so, what mitigation and management measures will be implemented.	The proponent recognises that this arid zone has been assumed to function as a potential barrier to Cane Toad invasion in published modelling studies of the species' potential future distribution. However, given that turkey's nest local water storage for construction will represent extremely minute points in the arid landscape, separated by tens of kilometres of desert sandplain from the nearest surface water – and only present for relatively short periods of time during construction before relocation – the risk of this enabling Cane Toad movement from the Kimberley to the Pilbara currently appears to be remote. No specific mitigation would therefore appear to be warranted. Even though this is the case, contingency measures to respond to the unlikely event of a Cane Toad detection during construction will comprise capture and humane euthanizing of the individual, despatch of the specimen to the WA Museum for confirmation, notification of DBCA and implementation of follow-up investigation and measures in consultation with DBCA (including identification of introduction pathway, monitoring of the detection site and similar potential entry points).
DWER TF 6 Prop RtS 4.19	DWER	A number of information gaps exist regarding the surveys. The following additional information is required to inform the assessment: 1. Provide a figure illustrating the location of survey sites in relation to fauna habitats and proposal impact areas, including infrastructure. 2. Provide justification for the placement of SM2 and SM4 ultrasonic sound recorders and the fauna habitats surveyed to target waterbirds and the Night parrot, which have different habitat requirements. 3. Provide a figure illustrating the location of significant species in relation to the fauna habitats and proposal impact areas, including infrastructure. 4. Discuss whether suitable Night parrot habitat is present in the development envelope area. 5. Justify the methods used to analyse sound recordings for Night parrot. Sound recordings were manually scanned visually and compared to calls available online (Appendix 7). It should be discussed whether any potential calls were identified and compared against similar species (e.g. Pallid cuckoo); and whether these calls were verified by an expert with experience in Night parrot calls.	It is acknowledged that some of these items were inadvertently not detailed in the fauna survey report (Appendix 4 of the ERD). The following answers are provided: 1. The survey report did detail survey sites in relation to fauna habitats (Table 5.1 of that report), and the ERD (Figure 4.8) did map survey sites on fauna habitats, but the requested figure is also provided below (Figure 1.2), noting that the locations of infrastructure are conceptual design only, as set out in response to Item 4.15 above. 2. Ultrasonic recorders were not actually deployed to target waterbirds or Night Parrot (these are only used for bats). The sites where audible range SM4s were deployed were appropriate to provide a spatial spread of locations along a transect of the north portion of the development envelope, targeting waterbirds that may have moved south from Mandora Marsh, but this was in fact also the most prospective possible habitat for Night Parrot that was available within the development envelope, being Triodia hummock grassland (noting point 4 below, however, that there is no true core habitat for the species present within the development envelope). 3. A figure such as that requested was already provided for the only significant species where this is meaningful: the Black-footed Rock Wallaby (Figure 4.26 of the ERD), as it is the only significant species strongly spatially linked to a very specific and fixed habitat in the study area (as set out in the ERD). There is limited value in attempting to map current records of Bilby in this context, for example, as it will be several years before ground clearing commences, and the fire ecology of this species means it is very likely they will have moved from areas where they occurred in 2018 by then, and that they may well, by that time, occupy areas they were not recorded in during the surveys. The impacts on Priority fauna were already quantified by habitat loss in the ERD and plotting these against the conceptual design will add little to inform the impact assessment, particularly when there is a likelihood that the final design may well be modified from the representative footprint in the ERD (within the conditioned limits of the Ministerial Statement), as set out in response to Item 4.15 above. 4. The fauna report (Appendix 5 of the ERD) already discusses that there is no suitable core habitat for Night Parrot in the development envelope, and that the only more prospective habitat in the locality was further north within Walyarta Conservation Park (p57 in summary, and discussed at length in Appendix 3 of that report). 5. The methods used were consistent with the guidance provided by DBCA and the verification was conducted by Mr John Graff (a recognised ornithologist who was previously Warden of the Broome Bird Observatory) and Dr Stewart Ford (also well known within the state for his ornithological knowledge), both of Biota Environmental Sciences (Biota), who have experience with identifying Night Parrot calls. Virtually all of the very large volume of audible range recordings were crickets or songbirds, with no files potentially representing Night Parrot from the six months of recording.

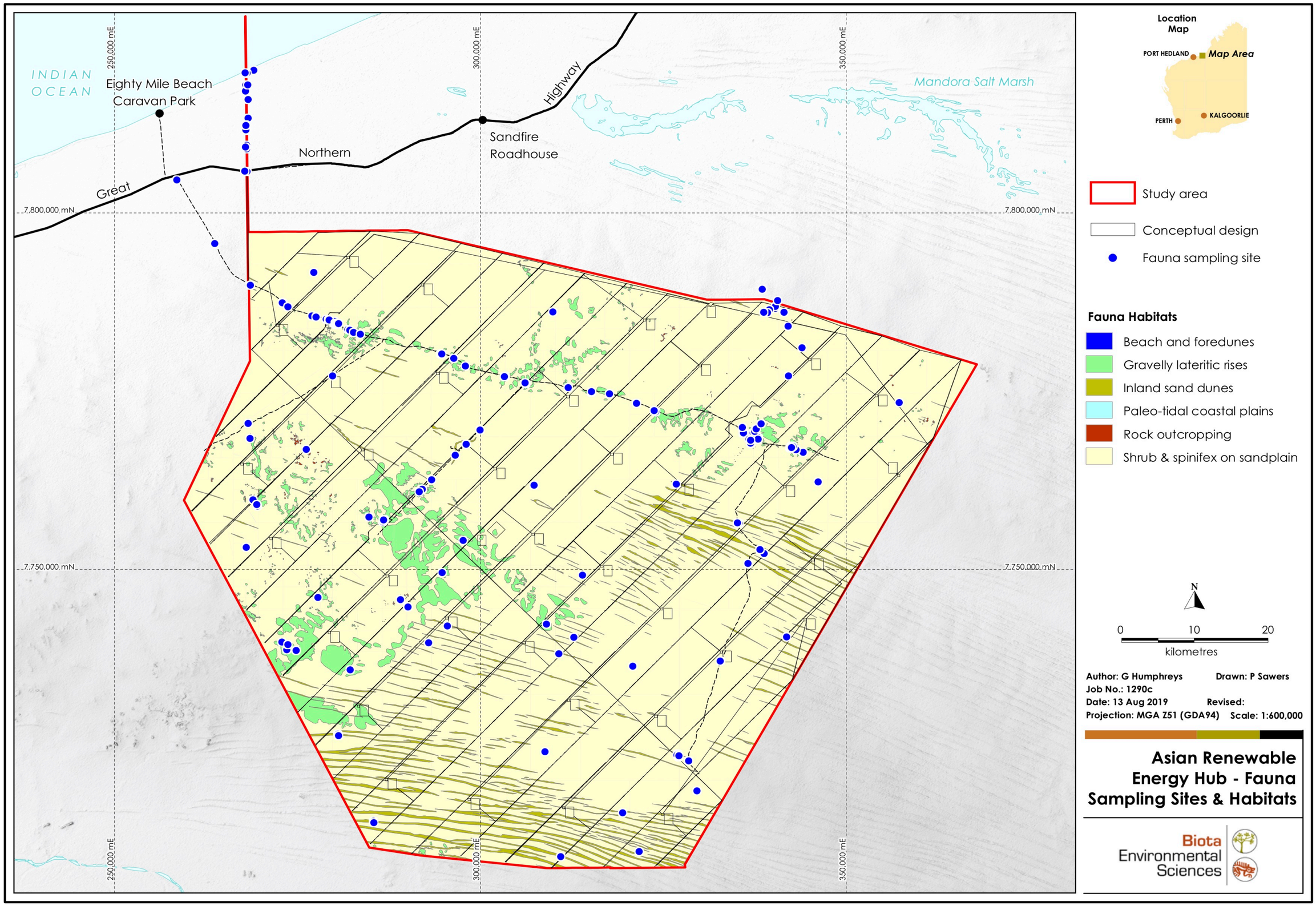


Figure 1.2: Locations of all types of fauna sampling sites relative to the range of habitat types present within the development envelope and the conceptual design clearing footprint.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 7 Prop RtS 4.19	DWER	The ERD states that the vegetation cleared for infrastructure will act as fire breaks, but does not adequately acknowledge that clearing will result in habitat fragmentation over a very large area (over 11,900 ha). Please provide further information regarding the regional significance of clearing multiple linear areas of fauna habitat over a very large area in a relatively undeveloped landscape.	The proponent suggests that the perception of habitat fragmentation by linear clearing may be a function of not fully appreciating the geographic scale of the development envelope (something which is difficult to achieve without spending time on the site). This is illustrated by the wording of this submission itself: it states that the clearing will occur over an area of 11,900 ha but in fact that number is actually the total footprint area for the project, which will be far more widely distributed and spaced out across the entire development envelope; an actual extent of over 662,500 ha. That in itself is a significant conceptual difference that must be recognised, in that the spacing of the proposed tracks is so great within the very large area of habitat that will remain undisturbed, that there will be no significant effect of fauna habitat fragmentation. As noted in the ERD, the blocks of uninterrupted habitat vary in size but will be of the order of 15,000 ha each before a track of approximately 10 m finished width is reached and another ~15,000 ha block of contiguous habitat commences. In cross-section, this means that a single track of 10 m width would be constructed within a length of approximately 10,000 m of habitat (a 0.1% break in habitat). To better demonstrate this, MapInfo GIS has been used to generate a representative cross-section to visualise the lateral scales involved and illustrate the relatively minute clearing due to tracks in a cross-sectional view (Figure 1.3). The great majority of the fauna documented for the development envelope are small mammals and smaller-body sized herpetofauna, which have relatively localised scales of movement and will live their entire life cycles within the 15,000 ha blocks of habitat without ever encountering a track. Larger body sized mammals (such as the Bilby) or reptiles (such as *Varanus giganteus*) that can undertake greater movement in the landscape, will readily cross tracks, and movement by the avifauna of the project area will not be affected at all by the presence of the tracks. Considering all of the above, there are no impacts on fauna of regional significance due to habitat fragmentation.
DWER TF 8 Prop RtS 4.21	DWER and DMIRS	The ERD over-emphasises the effectiveness of proposed feral animal control, and does not adequately acknowledge the significance of the likely increase in introduced predators as a result of implementation of the proposal. For example: the European fox - which is a known predator of Bilby, Black-flanked rock-wallaby and Spectacled hare-wallaby - was not recorded in the study area during the surveys, but is known to be expanding its range through the Pilbara and arid zone. Dingo numbers have increased in the vicinity of mining projects located in the Great Sandy and Little Sandy Deserts due to the increased availability of resources. Dingoes at those sites are very problematic from a safety perspective. Dingoes also influence the numbers of other predators (Dingoes predate on foxes and cats). Division of the project area into large discrete vegetation blocks of about 15,000 ha each allows for the management of the areas as part of a mosaic burn pattern to favour vegetation growth patterns preferred by Bilbies. The same track pattern also creates highways for bilby predators including feral animals (foxes, cats) which has been recognised as a risk in the ERD documentation It is noted that records of feral animals during the surveys were limited, indicating that the population within the region is low. It is noted that the ERD commits to feral animal control in the region, which will provide some ecological benefit However feral animals is considered the most significant threat to fauna on the region and the EPA needs confidence that it has been adequately considered, planned for and will be resourced for both construction and the operational life of the project A Construction and Operational Environmental Management Plan is required to provide confidence that potential impacts of feral animals, particularly as it relates to conservation significant fauna, will not have long-term impacts on fauna populations.	The proponent notes that while this submission states that the ERD *'does not adequately acknowledge the significance of the likely increase in introduced predators as a result of implementation of the proposal'* but the subsequent four points listed go on, for the most part, to appear to largely agree with the assessments in the ERD – to paraphrase: 1. The fox is not currently known from the study area – as noted in the ERD; 2. Dingoes may increase in numbers – noting the qualifications on the certainty of this raised in response to Item 2.7 above – and that while this could then represent a safety issue, that has no direct bearing on conservation significant fauna, other than that they may act to decrease the numbers of foxes (should they occur, which they currently do not appear to) and cats; 2. Mosaic burning will favour Bilbies but the establishment of a track network may allow increased feral fauna movement – which was already recognised in the ERD (as the submission itself notes); and 3. Feral fauna populations appear to be at relatively low density in the development envelope and that the proponent has committed to feral animal control, which is consistent with regional factors – which was also already set out in the ERD. It is therefore not clear how the submission concludes the ERD over-emphasises aspects and does not acknowledge significance of potential impacts, when the detail of the points it raised largely reiterate items already presented in the ERD? A probability remains that feral fauna may increase as a result of the proposal, and the revised EMP for the proposal includes additional detail on feral fauna management, which will comprise implementation of targeted feral fauna monitoring and control in areas of higher risk, such as around accommodation. Measures will include: 1. appropriate putrescible waste management, particularly of food. 2. prohibiting feeding of fauna or disposal of food outside of allocated waste disposal points. 3. targeted pest species control. In addition, the proponent will implement, a targeted feral fauna monitoring and control programme during operations, principally to reduce risk to Bilby and Black-footed Rock Wallaby, in consultation with DBCA.

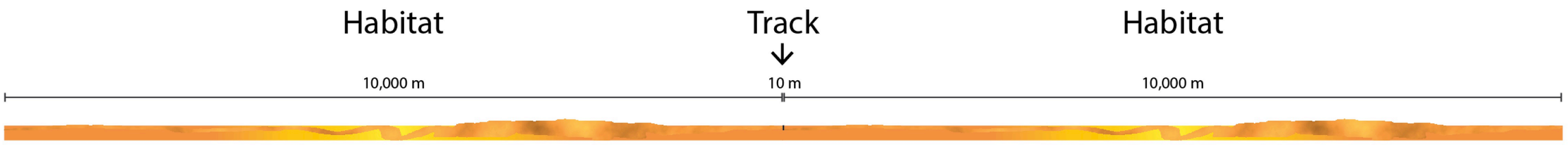


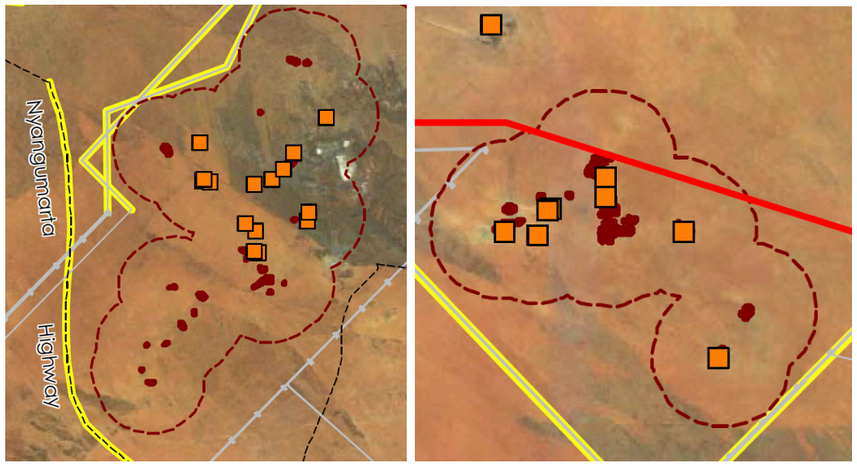
Figure 1.3: Representative cross-section illustrating relative size of a proposed access track compared to adjoining blocks of intact habitat.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 9 Prop RtS 4.22	DWER & DMIRS	The ERD does not discuss the impacts to fauna habitat (vegetation) from changes in hydrology and drainage as a result of bisecting dune and swale systems for the installation of linear arrays of wind turbine and PV solar modules and associated infrastructure. It is also noted that poor surface water management may also acerbate erosion and dune blowouts. Please provide further information about how surface water will be managed to maintain local hydrology.	The ERD does not discuss the impacts to fauna habitat from changes in hydrology *'as a result of bisecting dune and swale systems'* because there are none to discuss. Similar to the perception that significant habitat fragmentation will arise (see Item 4.20 above), the language used suggests that the real-world scale of the development envelope may not have been fully appreciated: while 'dune' is accurate, it is not appropriate to refer to the landform extent between one of these linear dunes and the next as a 'swale' – these should rather be termed an 'inter-dune sandplain', considering that they are virtually entirely flat (when true swales are typically shallowly sloping depressions) and cover an average distance of 1-2 km before the next linear dune is encountered. Referring to the landforms as *'dune and swales systems'* creates a conceptual view of the landscape that is far more small-scale and localised, and typical of coastal dune systems, rather than the landforms actually present in the study area. This then, can lead to a perception that surface hydrology may be affected when in fact the dominant hydrological process during rainfall events is local flooding and direct recharge via the sand-dominated stratigraphy of the development envelope, as opposed to a scenario of run-off dominating with overland flow into swales. The hydrology of the inter-dune sandplain habitats will be unaffected by tracks crossing the linear dunes at the perpendicular, as the dominant hydrological process is again localised and short-term flooding, with direct recharge to the underlying aquifer and loss to evaporation. This will continue unchanged. There is therefore no further information to be provided on this aspect, other than noting that the detailed design for the road network will include the incorporation of table drains, roadside swales and other drainage treatments to manage surface water such that local recharge is maximised and scour and erosion is minimised, consistent with current relevant Australian Standards and Main Roads design guidance. Stabilisation of completed surfaces where tracks intersect linear dunes is the key management measure that will address the risk of wind-driven erosion, and this will also address any localised scour effects. Finally, post-construction monitoring, and remedial works where needed, will also be conducted for the operational life of the project, in accordance with the revised EMP.
DWER TF 10 Prop RtS 4.23	DWER	Section 4.7 does not discuss the impacts to terrestrial fauna, in particular birds, from the establishment of the photovoltaic (PV) solar panel modules. For example, PV solar may impact avifauna by acting as an 'ecological trap' wherein waterbirds are attracted to the area, mistaking the modules for a waterbody. In addition, solar may attract species through the provision of shade and perching habitat, and attraction of insect prey species (e.g. Smith and Dwyer, 2016). The proponent should identify the potential impacts from PV solar and discuss the significance of these impacts to terrestrial fauna, and identify the management and mitigation for the impacts to terrestrial fauna from PV solar. If required, management actions should be incorporated into the Construction and Operational Environmental Management Plan.	The ERD does consider the impacts to terrestrial fauna of the PV arrays: the primary and most significant impact on terrestrial fauna from this component of the project is direct habitat removal. The impact of this on terrestrial fauna has already been quantified, discussed and mitigation measures detailed in the ERD. The effect referred to in this submission as an 'ecological trap' is more commonly termed the 'lake effect' and is currently considered in the literature to be a hypothesis only: Harrison et al. (2016) conducted a recent evidence-based review of the impact of solar farms on birds. The relevant conclusions of that meta-analysis were that: • no peer reviewed experimental scientific evidence exists relating solely to the ecological impacts of utility scale solar PV developments; • some scientific and grey literature data, based upon carcass searches around solar PV developments, suggests that bird collision risk from solar panels is very low; • there is likely to be more of a collision risk to birds presented by infrastructure associated with solar PV developments, such as overhead power lines (which the proponent has already committed to mitigating; see p195 of the ERD); and • little scientific evidence exists that demonstrates a direct impact of solar PV on birds. The Environmental Science Division of the United States Department of Energy (2015) conducted a similar review, and also acknowledged that this 'lake effect' was possible but also noted that it is hypothesised only with no clear data demonstrating it occurs, concluding that: *'…no empirical research has been conducted to confirm or refute this hypothesis.'* and that with the lack of consistent patterns in the available data *'…it is too speculative to make any conclusions about the influence of the lake effect fatality of water-dependent birds.'* The only clearly demonstrated significant impact of solar farms on birds has been associated with the thermal type of solar arrays that concentrate sunlight onto steam turbine towers[1], which do not form part of this proposal. Given the above, it seems unlikely that there is any significant impact predicted from the 'ecological trap' effect raised in this submission and no additional mitigation would therefore appear to be required. While the remaining potential impact mechanisms may result in localised behavioural changes in some resident bird species and individuals as mentioned in the submission, the extent to which this would represent a significant impact on regional avifauna biodiversity values would appear to be relatively low. The suggestion that insect aggregation is a driver for avifauna attraction to renewable power infrastructure is only stated by Smith and Dwyer (2016) in relation to solar steam turbine towers (p416 of that publication); presumably linked to locally higher humidity – as this does not form part of the proposal, there is nothing to suggest unusual numbers of insects would aggregate at the passive PV arrays proposed for the current project and thereby no driver for any localised behavioural changes in avifauna. A consistent theme through Smith and Dwyer (2016) is that the magnitude of potential impacts, and whether they occur at all, is site and species specific: this is relevant in regard to shade and perching behavioural changes, where those authors suggest this is most likely to occur with small songbirds, but that even this was not clearly demonstrated in their review. As the existing data suggest the suite of passerines present in the development are very widespread and common across the development envelope (and the bioregion), and a very small proportion of the development envelope will be modified by solar PV infrastructure, it seems unlikely that any regionally significant behavioural changes will arise to the extent that specific management is warranted.

[1] https://www.audubon.org/news/why-solar-power-good-birds

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 11 Prop RtS 4.24	DWER	The ERD analyses the flight heights of waterbirds in relation to the height of the wind turbine rotor swing range (Page 118 - Figure 4.27), but does not include analysis of species such as raptors and bats. Proposed management for avoiding impacts to birds from wind turbine blades includes a bird radar monitoring system to detect flocks approaching the wind farm (Section 4.6.7). To determine the suitability of this method, the proponent should provide further information on the function of the remote sensing and radar system. In addition, the management actions should include development of trigger criteria and procedures in the event that incidents of bird (or bat) strike with the wind turbine blades are recorded.	The risk to raptors was actually addressed in detail on p195 of the ERD, concluding that with the relatively low numbers of raptor observations during surveys, and the lack of nesting or regular uplift areas such as cliffs and steep valleys, the risk of regular potential raptor interactions with turbines appears to be relatively low. This low risk must then be overlain on the very wide spacing of the turbines in the landscape, again as set out in the ERD, which reduces the likelihood of significant impacts on raptors further. In regard to information on the use of bird radar and response, as detailed in the ERD (p199- 200), this will comprise: *1. 'Incorporation of bird radar monitoring to detect significant sized flocks of birds approaching the wind farm in advance, with automated alert responses triggered such that the full-time operational staff in the project control compound can respond.* *2. High definition video cameras with live feeds, which will be reviewed by personnel in the operations control compound.* *3. Protocols to shut down the operation of individual turbines or groups of turbines for periods when flocks are passing, based on both bird radar and video monitoring.* *4. Maintaining records of the number of major flocks of shorebird or waterbirds that have been detected and resulted in temporary shut downs, including the locations at which turbines were braked and the path the flock followed.'* Unlike many wind farms, the project will have a full-time staff, which enables the above type of approach to be effectively implemented. The proponent also notes that the wind farm will not be fully operation for at least eight years and that radar, high-definition imagery and response technology solutions are continually evolving: the best practice solution that is available on the market at the time turbines are commissioned will be implemented. An example is the relatively recent emergence of the DT Bird system, which uses high-definition video and bird deterrents, and is more accurate than radar at detecting birds2. The bat assemblage recorded from the development envelope does not include any species of conservation significance and all species are widespread in the northwest or the wider extent of the state. In addition, virtually all records of bats came from detectors situated near rock pile habitat (see Figure 4.5 and Table 5.5 of Appendix 7 of the ERD). This likely reflects that these represent one of the few features in the landscape with adequate structural complexity to provide roosting opportunities for bats. As these areas will be avoided in the design due to their value to the Black-footed rock-wallaby (see Item 4.26), potential impacts on bats in these areas will be mitigated through avoidance. Four of the five bat sites in the sandplain habitat that typifies the development envelope, and where the great majority of the turbines will be situated, recorded no bat calls at all; consistent with their large separation distance from any roosting opportunities in the extensive sandplain. Given this, and that no bats of conservation significance were recorded from the site, the data suggested a very low likelihood that significant bat conservation values could be at risk, which was why this did not form a focus of the ERD and no trigger criteria relating to bats therefore appear warranted.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 12 Prop RtS 4.25	DWER	Some aspects of the management and mitigation proposed in the ERD, the FMMS and the CEMP are not appropriate, as discussed below: The ERD, FMMS and CEMP over-emphasises the positive benefits of the proposed fire management as mitigation for impacts to terrestrial fauna species and habitat: • Insufficient evidence has been provided in the FMMS to support the assumption that indicative prescribed burning will be suitable to enhance biodiversity values for fauna. For example, the prescribed burning construction schedule does not appear to consider the fire history (year since last burnt) and it is unclear how this burning pattern will benefit fauna species such as the Bilby. • The FMMS does not state how fire will be managed to avoid impacts to black-flanked rock wallaby foraging habitat or critical vegetation. • The use of fire as a mitigation action for terrestrial fauna is not appropriate. For example, the ERD states that mitigation includes "burning of the construction areas in advance of earthworks commencing to displace Bilby into the adjoining, suitable fire age habitat blocks" (see also Appendix 6). Using fire to displace Bilbies is not an appropriate mitigation method because changing fire patterns are a key threatening process for the Bilby, as it removes vegetation and makes individuals more vulnerable to predation. Pre-clearance surveys are an appropriate strategy. However, any planned translocation of Bilby should be undertaken in consultation with DBCA. • Fire also has the potential to impact long unburnt areas of spinifex, which is important habitat for the Spectacled hare-wallaby (Priority 3, Biodiversity Conservation Act 2016). The impacts to Spectacled hare-wallaby and proposed mitigation to manage impacts to this species should also be discussed. • As discussed previously, please prepare a Construction and Operational Environmental Management Plan and a Fire Management and Monitoring Plan. These plans should be prepared in accordance with EPA guidance and contain specific, measurable, attainable, relevant and timely outcomes, actions and criteria.	The proponent maintains that the ERD and its appendices do not in any way overemphasise the benefits of imposing a managed fire regime on the currently unmanaged fire setting of the development envelope. As set out in response to Item 4.18 above, the individuals consulted and involved with preparing the fire management strategy, and who concluded it will lead to positive landscape-scale effects, all have extensive experience in fire management and ecology in the arid zone, in addition to that added by the principals of Biota who contributed to its preparation and have also been involved in ecological studies and research in the arid zone for 30 years, including fire ecology ARC Linkage Grants. In response to the points raised: 1. There is now a body of literature that demonstrates that shifting from uncontrolled, too frequent, too hot and too extensive fires, to a managed regime of suitably-timed prescribed burns results in a mosaic of different fire ages that improves biodiversity at the landscape scale (e.g. Casson and Fox 1987, Burrows and Christensen 1991, Bradstock et al. 2012, Ziembicki et al. 2015). Both on-site first hand experience and imagery analysis indicates that the development envelope is currently already experiencing such extensive and routine hot fires, as set out in the ERD, so an improvement in biodiversity values is a realistic prediction for the implementation of a managed fire regime. Figure 4.2 of the Fire Management and Monitoring Strategy, only shows provisional construction scheduling as an approximate guide to overall timing, not a detailed prescribed burning schedule. 2. As already set out in the Fire Management and Monitoring Strategy (p25), specific management account will be taken of the habitat blocks within which the confirmed Black-footed rock wallaby rock piles occur, again noting that these were already seriously burned by a hot, uncontrolled fire between Phase 1 and 2 of the terrestrial fauna survey during 2018 due to the currently unmanaged fire regime of the site. 3. This comment seems to only consider part of the conservation advice, in that it is actually extensive and intense fires that are the key threatening process for Bilby by removing vegetation cover and potential increasing predation pressure – it must be explicitly recognised *that this is what is already occurring on the site at large scale*: the proposed use of fire as a management tool, and to generate mosaics of differing fire age habitats, is distinct from this threatening process. The standard pre-clearance survey approach is – as clearly committed to in the ERD – the contingency management response that will be implemented in the event that field data do not demonstrate that the progressive use of fire to modify habitat, and lead to resultant animal behavioural responses, is effective. It is currently considered unlikely that translocations will be needed, but if they ultimately are required, all management will meet statutory requirements. After further review, consideration and consultation, the proponent has revised the approach for the track network at least to a targeted search protocol for Bilby, in recognition that the probability of a Bilby burrow – that is actually active and being used at the time of construction – being intersected by final track alignments is very low. The disturbance footprint of the development envelope is proportionally small and Bilby do not occur equally across the landscape at any given time, and individuals use multiple burrows. In the event that an active burrow is located on a track alignment immediately prior to earthworks, this will be monitored for activity until high confidence is gained that it is not currently being used (via multiple automated cameras, track assessment). The burrow will then be decommissioned such that the individual will utilise another of its multiple burrows or create a new burrow, as has been observed during DBCA regional studies. This approach will be conducted in liaison with DBCA, which will be represented on the project's fire management steering group. Larger, non-linear areas of footprint will still be subject to trials of the effectiveness of fire prescription to manipulate Bilby to move out of planned disturbance areas, both from the perspective of newly burnt and long unburnt areas (which may be unattractive to the species). 4. Similar to the Black-footed rock wallaby, locations where Spectacled Hare-wallaby occur are currently very limited within the development envelope (a single track record only), but will be given specific management consideration to ensure blocks of long-period since fire Triodia habitats are provisioned for. Revised and expanded versions of the EMP and Fire Management and Monitoring Strategy have been prepared and accompany this document.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 13 Prop RtS 4.26	DWER	The CEMP states that infrastructure relocation and the avoidance of clearing core habitat, foraging habitat and movement corridors will be undertaken to minimise impacts to the Black-footed rock wallaby. However, Figure 4.26 of the ERD illustrates the infrastructure network that avoids rocky outcrops, but will fragment habitat between these areas. The proponent should discuss how corridors that enable the movement of the Black-footed rock wallaby between rocky outcrops will be identified and avoided.	The proponent is not fully clear why this submission concludes that the *'infrastructure network…will fragment habitat between these areas.'* On the contrary, the figure referred to in the ERD clearly shows that the individual buffers applied to all proximal rock piles with confirmed Black-footed rock wallaby records overlap and have been merged, such that a single consolidated overall buffer is generated – which provisions for exactly the type of movement between rock piles that this submission calls for. The two excerpts from Figure 4.26 of the ERD below illustrate this (orange squares represent rock piles where Black-footed rock wallaby have been confirmed):  There are no proximal rock piles where the species is known to occur where infrastructure will *'fragment habitat between these areas'*, unless this submission is referring to the two large-scale, landscape nodes of occurrence, whereby Rock-wallaby activity was detected by Biota (2018) around the existing Nyangumarta Highway and at the northern limit of the development envelope and further north? These activity centres are separated by over 15 km at their closest points, whereas Eldridge and Pearson (2008), by comparison note of the species: *"Feeding occurs as near to shelter as possible…however, if food is unavailable near shelter they will move up to several hundred metres away to obtain it."* The PhD research of Pentland (2014) of a colony of Black-footed rock wallaby also found that no individual moved more than 50 m from rock pile shelter on a regular nightly basis. Even under poor conditions, individuals of the species are therefore unlikely to move any further than a few hundred metres from their rock pile. It is therefore very unlikely that individuals from the two nodes routinely move over the 15 km of intervening area between the two separated activity centres within the development envelope, and there is therefore no reason to provide corridors for movement in that wider context. There data showing occasional successful long distance movements between Black-footed rock wallaby colonies are very limited – the only example the proponent is aware of is Eldridge et al. (2001), and in that case inferences from genetic data indicated a maximum movement between colonies of 8 km. The separation between the two nodes of rock piles in the development envelope is almost double this distance. The proponent therefore considers that infrastructure has been proactively re-designed already to provision for rock wallaby movement – at the localised scale where there is any realistic probability of this occurring.
DWER TF 14 Prop RtS 4.27	DWER	The cumulative impacts to terrestrial fauna and fauna habitats, and flora and vegetation have not been fully considered in the ERD. The ERD states "The proposal is set in a location where there has been virtually no land use development and no existing infrastructure". However, Ministerial Statement 993 includes a bore field in the southwestern portion of the Great Sandy Desert. The proponent should identify adjacent existing or proposed developments within proximity of the proposal, and quantify any potential regional cumulative impacts.	The proponent maintains that the cited text quoted from the ERD is accurate and that there has been virtually no land use development in the location of the development envelope. Inspection of aerial imagery and the land use planning maps provided in the ERD support this view. The example given in this submission (EPA 2014) is located over 70 km to the west of the development envelope and even then only accounts for clearing of 886 ha of the Nita land system (the only regional context mapping available), which has a mapped area of 1,429,175 ha within the McLarty, Mackay and Pindanland subregions. As that existing impact of 886 ha then represents 0.06% of the land system's regional extent, and 1,428,289 ha of the Nita land system remains undisturbed, it seems that *'virtually no land use development'* is still a reasonable description of the locality context for the development envelope.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 15 Prop RtS 5.2	DoEE	Fauna and, to a lesser extent, flora surveys have, for reasons of scale, been largely confined to existing access tracks. The DoEE notes that surveys have been designed to cover representative habitat types and have been supplemented with aerial data. Notwithstanding this, the lack of on-ground survey coverage (including in areas where clearing etc. are planned to occur) means that it is difficult to determine the importance of the project area for more transient species such as the Greater Bilby or species that have the potential to occur over a larger area, such as the Fringed Fire-bush. It is acknowledged that species such as Northern Quoll and Black-footed Rock-Wallaby are likely to be largely confined to rocky outcrop habitat.	To clarify: the systematic survey sites accessible by vehicle were not supplemented by just 'aerial' data, but rather additional locations were accessed on-ground via helicopter and 43 sites sampled by flora quadrats, releves and habitat assessment sites by the same experienced biologists who conducted the balance of the field surveys. The purpose of this was two-fold: to confirm that the main systematic sites in the survey were representative of the range of habitats in the wider development envelope and secondly to ensure no novel habitats were missed. This also included documenting any evidence of Bilby activity. As appropriately noted in this submission, the Bilby is a 'transient' species in the sense that individuals move around in the landscape in response to fire history, rainfall and the presence of suitable foraging habitat (as discussed in the ERD and Appendix 6 of the ERD). As per point 3 in responses provided to Item 4.19, much of the development envelope may represent potential habitat for the Bilby, subject to recent fire history, substrate and vegetation structure. As clearing for the project will not commence for several years, there is little value in expending extensive effort in surveys of the conceptual design footprint when a) the conceptual design may be modified in the process of detailed design; and b) Bilby individuals may have moved on from habitat they currently utilise and could be present in areas that are currently not suitable for them by the time clearing for construction commences. It is for this reason, and in recognition that the proposal has a long construction period of approximately a decade, that the approach of trial implementation of fire management, with species-specific monitoring feedback to determine effectiveness, will be undertaken in advance of construction moving into new areas. The contingency approach in the event that this does not work is site-specific searches, as set out in the ERD. The Fringed Fire-bush (*Seringia exastia*) will no longer be a Threatened species by the time clearing for the proposal commences (see response to Item 5.1 above). The proponent agrees with the view that Northern Quoll and Black-footed rock-wallaby are likely to be largely confined to rocky outcrop habitat.
DWER TF 16 Prop RtS 5.3	DoEE	The DoEE notes the following in regard to the Greater Bilby (*Macrotis lagotis*): *Fire Management* The DoEE notes that implementation of FMMS is proposed utilising the access tracks to be constructed as part of the proposed action. The ERD states (pg. 30) *"the use of prescribed burns provides a means of management to move the Bilby population within the landscape, passively relocating them away from planned construction areas through means of their own behavioural ecology."* It also states, *"potential construction directs impacts on the Bilby will be mitigated via the application of fire management, supported by pre-clearances targeted surveys to validate the effectiveness of the approach and provisioning of additional contingency management actions if required."* The DoEE is unlikely to consider fire prior to construction as a mitigation measure. Further scientific justification is required to demonstrate the effectiveness of this proposed measure, and that it will not result in adverse impacts to the Greater Bilby or other listed species. *Predator Management* The DoEE understands that the clearing of access tracks, in combination with increased human presence (and resultant waste etc), has the potential to increase the occurrence of feral fauna that are predators of listed threatened mammal species in the area (ERD pg. 196). Detailed mitigation and management measures beyond those outlined in the CEMP are required to ensure no residual significant impact will occur.	In regard to fire management: very similar queries are responded to in detail at Items 4.18, 4.25, and 5.2 above. To recap: 1. There is an body of literature demonstrating that shifting from uncontrolled, too frequent, too hot and extensive fires, to a managed regime of suitably-timed burns results in a mosaic of different fire ages that improves biodiversity, which will also benefit the Bilby (Southgate 2006, Southgate and Carthew 2007). 2. Bilby conservation advice (Department of the Environment 2016) states that it is extensive and intense fires that are the key threatening process for Bilby and it must be recognised *that this is what is already occurring on the site at large scale*: the proposed use of fire as a management tool, and to generate mosaics of differing fire age habitats, is distinct from this threatening process. As set out in Item Prop RtS 4.25 above, the primary management for the project's linear footprint has now been revised to preclearance searches and management as the primary approach to mitigating impacts. 3. While data for this specific site are lacking, the use of fire as a management tool – particularly in settings where there are currently frequent, hot fires, is not a new concept and has been researched for over a decade: Southgate (2006), in considering Bilby in desert settings, *'…investigated the potential of fire as a form of low-intensity manipulative management to improve the wild bilby populations. The use of fire as a management tool was examined because previous research indicated that fire-promoted food sometimes formed a large component of the bilby diet.'* The conclusions of that work went on to state: *'…I was able to link fire pattern and bilby prevalence. Seed from a fire-promoted plant* Yakirra australiense *formed most of the plant material consumed, particularly in close proximity to recently burnt habitat. This provided a strong indication that habitat suitability for the bilby could be improved with fire management.'* The importance of fire as a management tool is continuing to emerge as priority in the literature. For example, a comprehensive review of fire regimes and management in northern Australia by Ziembicki et al. (2015) concludes: *'…fire management represents an important tool for maintaining mammal populations. Ideally, the frequency of large, hot fires should be minimised. This can be achieved using strategic prescribed burning early in the dry season, under mild fire weather conditions*.' This is precisely the philosophy and objectives that the proposal's Fire Management and Monitoring Strategy expounds, including the adaptive management aspects recommended by Ziembicki et al. (2015). 4. Conventional pre-clearance surveys have been committed to in the ERD as the contingency management response that will be implemented in the event that field data do not demonstrate that the innovative use of fire to modify habitat, and lead to resultant animal behavioural responses, is effective. Any translocations that may ultimately be required will meet all statutory requirements. 5. It may eventuate that a combination of management methods, which will be ratified with DBCA, including introducing appropriately timed fire as a 'push' factor, with past burning in adjoining areas so they are optimal for the Bilby, targeted feral fauna control (including the participation of traditional owners as has been successfully implemented elsewhere after prescribed burns), burrow searches, decommissioning of burrows, and translocations, may in concert provide the optimal management solution, but this cannot be tightly defined in the absence of adaptive feedback data the pilot programme will yield.

No.	Submitter	Submission and/or issue	Response to Submission
DWER TF 17 Prop RtS 5.4	DoEE	The DoEE notes that impacts to resident and migratory species likely from the proposed development include mortality from collision with turbines and powerlines; and disturbance from installation of underground/undersea cables. The timing of cable installation activities and implementation of appropriate water quality management measures should minimise impacts to turtles and migratory shorebirds. Data on the flight routes used between north-western and southern Australia are very limited and the routes are not well understood. This includes locations in south-western Australia where a 'Great Circle' route (the shortest distance migratory route between two points) would potentially take some migratory birds over the development envelope. Localised movements between coastal areas and inland lakes (in wet years) is also problematic. While the distance between the Eighty Mile Beach Ramsar site and the project is approximately 70 km, it is possible that migratory shorebirds may overfly the development envelope. Leg-flag and field observation records provide no information about the actual routes used by shorebirds moving between Eighty Mile Beach and the southern half of the Australian continent. Shorebird flight height is variable and depends on species' specific behaviour. Birds on migration will fly at greater heights than those engaged in localised or regional movements. Bird mortality from collision with turbines and powerlines may continue to be an issue, even with the mitigation measures proposed. A large number of birds use Eighty Mile Beach and nearby wetlands, and tend to fly at lower heights when moving through the local landscape than when undertaking migratory flights. Bird monitoring and shut down protocols may help reduce the risk of adverse impacts.	The majority of this submission seems to reiterate and re-state parts of the findings of the ERD in respect of migratory shorebirds, but does this somewhat selectively and takes aspects out of context, including reaching conclusions contradictory to some of the evidence-based assessment present in the ERD without any citations or data to support the opposing view: 1. The ERD did not actually conclude that there were impacts 'likely' to resident and migratory species; rather that these aspects of the proposal were identified as potential impact mechanisms, but that with due consideration to overall site selection and other mitigation, significant residual impacts were actually unlikely. This includes specific timing of the cable installation works to avoid impacts on migratory species mentioned here, as set out in the ERD (e.g. p29, 31 and 126). 2. The second paragraph re-states the information that was already presented in the ERD (p187) (though it incorrectly places the separation distance to Eighty Mile Beach as 70 km when it is actually 26 km), so no response appears to be required. 3. An extensive literature review was conducted by an experienced ornithologist (previously stationed at the Broome Bird Observatory), to compile all available actual data on migratory shorebird flight heights, including variation in reported elevations (see Appendix 8 of the ERD). Personal observations by Broome Bird Observatory and ornithologists involved with the migratory shorebird survey completed for the proposal were also sought and collated on this aspect, particularly in regard to the behaviour and speed with which departing birds gain height (most observations indicate this is fairly rapid). Considering the minimum 26 km and 16 km separation distances, a more balanced prediction would be consistent with that presented in the ERD: that it is more likely that shorebirds will have gained a height exceeding the rotors, even if they do overfly the development envelope. This is supported by the lack of calls recorded over a six month period from recorded deployed on the site which have an approximately 2-300 m microphone sensitivity range into the sky (subject to conditions on any given day), and the lack of any significant sight or call records of migratory shorebirds during surveys. On balance then, there appears to be little basis on which to significantly alter the findings of the evidence-based work completed for the ERD assessment. 4. Lastly, as noted in response to Item 4.24 above, it must be re-emphasised that the use of a detection and shut down response system in relation to the turbines is not the primary mitigation of impacts on shorebirds or waterbirds – that is achieved by the macro-siting of the project and its significant separation distances from Eighty Mile Beach and Mandora Marsh (p201 of the ERD) (see also the response to Item 4.24 above for a related discussion). However, in the unlikely event that this very large separation distance is not adequate, and that the available body of evidence and the risk assessment of the ERD are misleading, and significant numbers of migratory birds do interact with the turbines, then the proponent's contingency management measure of implementing a system at least equivalent to the currently available DTBird system[2]. This technology has a documented track record of detecting a wide range of bird taxa and body sizes, and is demonstrably effective at shutting down turbines in response to detections. The reports documenting this effectiveness at https://dtbird.com/index.php/dtbird-dtbat-document-downloads were completed under the supervision of, or in scientific collaboration with, independent avifauna specialist organisations including BirdLife International and the Swiss Ornithological Institute. The proponent notes that such wind energy technology is rapidly evolving, and that the DTBird system itself has only been available relatively recently – given that the proposal will not be fully commissioned for at least 10 years, the proponent is committed to implementing the best and most well-demonstrated solution available on the market at that time, with the DTBird system the minimum capacity that will be implemented.

[2] https://dtbird.com/

Hydrological Processes

No.	Submitter	Submission and/or issue	Response to Submission
DWER HP 1 Prop RtS 4.28	DWER	The proposal is situated on relatively flat land. The northern portion of the development envelope slopes gently towards the Mandora Salt Marsh and Salt Creek, which forms part of the internationally significant Eighty Mile Beach wetland. Given the lack of defined permanent/semi-permanent watercourses between the proposal area, Mandora Salt Marsh, and Eighty Mile Beach Ramsar wetland, it is unlikely that the hydrological processes which define the marsh and wetland will be impacted. However, the proposal will require the construction of 1514 km of site access tracks which will require the clearing of more than 2000ha of land (Table 2.3, ERD Part 2). The majority of these access tracks will be in existence for at least 50 years. These access tracks have the potential to interrupt sheet flow to the wetland. Please provide details of the design of construction and operational access roads and any management strategies that will be developed to ensure the access tracks do not impede surface water flow, to the extent that there is significant residual impact to threatened ecological communities and/or wetlands.	It is unclear how this submission can in one part initially state (correctly) that *'it is unlikely that the hydrological processes which define the marsh and wetland will be impacted.'* but then continues in the same submission to state (erroneously) that *'These access tracks have the potential to interrupt sheet flow to the wetland.'* Sheet flow, in the accurate use of the term, is a specific hydrological process that only occurs in very limited landscape settings within the northwest of the state and only over relatively short distances. The sandplain that dominates the great majority of the development envelope would experience localised overland flows of varying types during rainfall events, but this is not true sheet flow as this submission states. The habitat values that make Eighty Mile Beach important to migratory shorebirds are intertidal in nature, are linked to invertebrate infauna in nearshore marine sediments, and are sustained by daily tidal exchange from oceanic sources – not any putative link via sheet flow from the development envelope 26 km to the east, which would in any event already be interrupted by the existing presence of the Great Northern Highway if it did exist. Inland run-off from local catchments north of the development envelope does contribute to the episodic flooding of Mandora Marsh, but the wetland is separated from the development envelope boundary by 16 km at its closest point. Given this, and that the alignment of the track network would actually parallel any north-easterly putative flows toward the marsh (not intercept them), it is extremely unlikely that the creation of tracks 16 km away, that will account for less than 1% of the overall sand-dominated landscape, will have any measurable effect on surface water flows even at the boundary of the development envelope, let alone at Mandora Marsh. There will therefore be no impact to these wetlands or Threatened Ecological Communities, as concluded in the ERD.

Inland Waters Environmental Quality

No.	Submitter	Submission and/or issue	Response to Submission
DWER IWEQ 1 Prop RtS 4.29	DWER	While it is unlikely that clearing associated with the proposal would result in downstream or off-site sedimentation impacts; however, potential impacts to surface water from sedimentation and /or changes to hydrological flow regimes should be discussed.	It is unclear why potential impacts from sedimentation should have been discussed when the submission prefaces this request with its own assessment that such impacts are unlikely to occur - a view with which the proponent agrees: As discussed at length in the response to Item 4.28 above, no off-site sedimentation impacts will arise from the proposal. Local scale hydrology will be managed through water sensitive design incorporated into standard track civil works for the project to manage surface flows and maximise local aquifer recharge, as set out in the revised EMP. This will include measures such as cut-off drains and detention basins in any areas where significant mobilisation of sediment due to the project might arise.
DWER IWEQ 2 Prop RtS 4.30	DWER	Onsite activities during construction and operation should be designed to avoid groundwater contamination from hydrocarbons or metals, given the proximity of high value environmental assets. Please provide a discussion of and management measures with regard to surface water or groundwater contamination.	The proponent assumes that *'…given the proximity of high value environmental assets'* in the context of any risk of groundwater contamination is a reference to Eighty Mile Beach and the Mandora Marsh? As set out in the ERD, these environmental assets are separated from the development envelope boundary by 26 km and 16 km respectively, and the locations at which hydrocarbons might be stored would be even further removed (in excess of 30 km and 20 km at the very least). As for other aspects of the proposal, these very large separation distances make the risk of any contamination reaching the coast or the marsh negligible. The proponent will still implement best practice hydrocarbon management and storage as set out in the revised EMP – consistent with anticipated Part V licensing conditions – to ensure local groundwater contamination within the development envelope does not occur. Two prescribed premises categories are anticipated as being potentially required: concrete batching (77) and bulk chemical storage (73).

Social Surroundings

No.	Submitter	Submission and/or issue	Response to Submission
DWER SS 1 Prop RTS 3.2	DPLH	It is recommended that clearance surveys, archaeological and ethnographic heritage surveys are provided to DPLH, once the finalised reports are have been approved by the Nyangumarta People.	The proponent commits to providing reports to DPLH on the findings of future heritage surveys, once approved for release by the Nyangumarta People.

No.	Submitter	Submission and/or issue	Response to Submission
DWER SS 2 Prop RTS 4.31	DWER	The flora and vegetation survey report states that “the main study area lies entirely within the western section of the Nyangumarta Warrarn Indigenous Protected Area (IPA)” (p. 27). This is not mentioned within the ERD. Please provide more information on how this has been considered.	There is already detailed information relating to proponent engagement with the Nyangumarta people in the ERD and how this was considered in the development of the proposal and will be maintained for the life of the project, including that an Indigenous Land Use Agreement is currently in negotiation between the proponent and the traditional owners. A draft ILUA has recently been submitted to DPLH for review, since the State will be a signatory along with the proponent and the Traditional Owners. It is expected that the final ILUA will be signed in the first half of 2020.

Rehabilitation and Closure

No.	Submitter	Submission and/or issue	Response to Submission
DWER Rehab/ Clos 1 Prop RTS	DBCA	The outcomes for rehabilitation and closure are not currently clear or assured. Any disturbance activities undertaken on Kujungurru Warrarn Nature Reserve and Eight Mile Beach Marine Park, are to be planned, assessed and implemented in a manner that does not significantly affect the maintenance of the conservation values of the reserves. Please provide further details on the proposed rehabilitation and closure to ensure that the proposal does not significantly impact the conservation values of the reserve. Recommendation 2: That, for any disturbance activities on Kujungurru Warrarn Nature Reserve and/or Eighty Mile Beach Marine Park, a condition of approval is applied that requires the development and implementation of best practice completion criteria as the basis for successful rehabilitation and closure consistent with the reserves' purposes, to the requirements of the EPA on advice from DBCA. Recommendation 3: That, further to recommendation 2, a condition of approval is applied that requires monitoring and reporting on the achievement of rehabilitation and closure relevant to completion criteria, until criteria have been met to the satisfaction of DBCA.	The proponent acknowledges that there is an impact on the Kujungurru Warrarn Nature Reserve, but would like to reiterate that this is – in real terms – very minor: as set out in the ERD (p146) the cable route traverses the Nature Reserve for a total distance of just 261 m and will require temporary clearing of 1.27 ha in total; <0.05% of the reserve by area. The only significant impact mechanism are the temporary vegetation clearing and the risk of weed spread, both of which were addressed in the ERD (p146) and will form part of the proposal’s EMP that the proponent will liaise with DBCA on during implementation (Item 1.3 above) The impacts on the Eighty Mile Beach Marine Park were also acknowledged and quantified in detail in the ERD (Sections 4.3 – 4.5), including specifically addressing the Marine Park values and management objectives (p125). As noted in Item 1.3 above, the EMP for the proposal now includes consultation with DBCA and communication protocols around both construction mitigation measures and ongoing operational monitoring. Rehabilitation measures to be implemented will comprise: 1. Temporary storage of topsoil from trenching excavation within the reserve, with topsoil segregated from deeper overburden material; 2. Direct return of overburden material and completion with stockpiled topsoil stored adjacent to the trench as soon as practical completion of the cable installation is undertaken; 3. Follow up monitoring of revegetation success comprising annual traversing and systematic sampling of the 261 m corridor to collect data on revegetation progress; 4. Measuring the data collected under point 3 above against completion criteria to be agreed with DBCA, with remedial works to be undertaken to the satisfaction of DBCA in the event that these are not reached within agreed timeframes; and 5. Annual reporting on the findings of the monitoring, including any remedial actions that may need to be implemented.
DWER Rehab/ Clos 2 Prop RTS 2.9	DMIRS	The project appears to be relying on the sale of scrap metals and other components salvaged from the turbines typically to offset its decommissioning costs. There are risks in using this assumption because demand can change significantly over time, and the remote nature of the site may also impact the ability to salvage or sell this material.	As documented in multiple locations within the ERD (e.g. p100, 151, 198, 218 and 220) the proponent has committed to the development of a closure plan, including the decommissioning and removal of all infrastructure in an environmental responsible fashion. Operational protocols for the project will also include the recycling of all materials that can be viably recycled during the life of the operation (see p100 of the ERD). Lastly, as again documented on p100 of the ERD, the cost of eventual closure and rehabilitation has been incorporated into the financial modelling for the proposal.
DWER Rehab/ Clos 3 Prop RTS 4.32	DWER	The maintenance and removal (decommissioning) of the HVDC (subsea) cables and any potential impacts have not been discussed in the ERD. Please provide clarification on whether maintenance and removal of the subsea cables are part of the proposal and if so, please provide further information on the activities, potential impacts and any management and mitigation measures.	The maintenance of the cable was actually discussed multiple times in the ERD (e.g. p28, 29, 35-36, 105-112) setting out that the potential impacts on the marine environment are very similar in nature to the initial installation. That is: short-term and transitory disturbance that will result in no lasting effect on the nearshore receiving environment. It is not expected that cable maintenance would be required any more frequently than once every five years. Once current no longer passes through it, it is likely that the cable, as a completely inert object buried 5-10 m below the seabed, would not be removed at decommissioning, unless expectations at that time dictate this is required

Consultation

No.	Submitter	Submission and/or issue	Response to Submission
DWER Consult 2 Prop RTS 9.2	WAFIC	It was unclear in the in the Marine Cable Route Environmental Assessment where identification of the commercial fisheries overlapping this site was undertaken. In addition to the Pearl Oyster Fishery there is Specimen Shell, Marine Aquarium Fish, Hermit Crab, Kimberley Crab, Beche-de-mer, and Mackerel Area 1 (Kimberley). All commercial fisheries should have been identified and then reviewed as to their relevance to the marine cable component of this proposal.	It is acknowledged that various fisheries are present in the wider region. The temporary disturbance of sediment habitat during cable lay (approximately one week per cable, along a 5 m corridor) is not expected to significantly impact regional fishery populations. The proponent is willing to maintain dialogue and work with WAFIC and commercial fisheries to ensure that cable installation activities do not significantly impact any planned fishery activities.
DWER consult 3 Prop RTS 9.3	WAFIC and PPA	EPA Services has received an enquiry from the Western Australian Fishing Industry Council (WAFIC) and Pearl Producers Association (PPA) regarding the proposal. It is strongly recommended that you contact Mannie Shea (oilandgas@wafic.org.au) 9432 7704 to provide an overview of the proposal, its potential impacts and to establish future ongoing consultation with them.	The proponent accepts and notes this recommendation.

Offsets

No.	Submitter	Submission and/or issue	Response to Submission
DWER Offsets 1 Prop RTS 1.6 and 1.7	DBCA	It is noted that the document includes a series of actions to reduce residual impacts through the application of the mitigation hierarchy. The document suggests that through the development and conceptual design of the proposal all residual impacts have been avoided. Subsequently, the document includes a statement suggesting that "…*no environmental offsets are required*…" (page 239). As indicated above, a transmission power line cable is proposed to intersect portions of Kujungurru Warrarn Nature Reserve (1,27 ha) and Eighty Mile Beach Marine Park (15.3 ha). This activity has the potential to impact on the values of these reserves and DBCA's capacity to manage the affected and adjacent areas in the long-term. If a requirement for environmental offsets for residual impacts eventuates, DBCA recommends consideration of mitigation involving 'in perpetuity' protection of like-for-like or better' conservation and biodiversity values, provided at a suitable offset ratio. If acquisition of a suitable area to achieve this outcome is not viable (i.e. tenure or conservation security constraints, etc.), enough resources should be provided to the end land use manager to manage residual liabilities associated with the affected portion of the reserved lands Further, if the proposal is likely to have a significant residual impact on conservation significant flora and fauna values, appropriate offsets that counterbalance any significant residual environmental impacts or risks on these values may also be necessary. Where offsets are required for residual impacts on conservation significant values, it is expected that relevant and proportional offsets will be developed that complement existing management and recovery activities (e.g. activities undertaken by DBCA under approved species recovery plans, etc.). It is also expected that DBCA's advice would be sought as an input to offset discussions on values for which the department has responsibilities	As discussed in response to Item 1.4 above, the assessment presented in the ERD concludes that there will not be any significant residual impacts on the conservation estate as a result of the proposal. This is both due to the extremely small proportion of the Nature Reserve and Marine Park that the proposal affects, that the disturbance is temporary in nature, and that there is high confidence in the rehabilitation and completion measures to be implemented. On this basis, the ERD concludes that observance of the mitigation hierarchy will result in no residual impacts (p233-239) and no offset ratio acquisitions as suggested here are warranted. Similar to Item 1.6 above, the extent of survey work completed for the proposal has clearly identified the conservation significant flora and fauna values, and the ERD presents the mitigation measures that will be implemented in the proposal to ensure that no significant residual impacts remain (p233-239 of the ERD). There is therefore currently no expectation that offsets are necessary in relation to conservation significant flora and fauna values.
DWER Offsets 2 Prop RTS 4.33	DWER	It is noted that the ERD considers that a significant residual impact does not remain for terrestrial fauna. However, the proposed impacts, management and mitigation measures proposed in the ERD does not provide the DWER with confidence that the bilby population will not be significantly impacted in the long-term. This is particularly given the potential impacts from increased predation and the proposed fire strategy. It is noted that the paper Cramer et. al. (2017) does indicate bilby habitat preferences based on vegetation age, but this paper also acknowledges the limited information available on bilby population, habitat and food utilisation and how the animals are spread through the landscape; the reducing area of occupancy of the species, and that further is required across various themes. The DWER notes that land acquisition offsets applied in other areas of the state are inappropriate in this area. The DWER recommends that further consideration be given to the provision of a research offset, particularly as it relates to the proponent's long-term strategy regarding fire management to promote bilby occurrence.	The proponent agrees with the views expressed in regards to research offsets and is of the view that its planned fire management and biodiversity monitoring programme will address exactly the knowledge gaps alluded to in this submission, and that that in itself represents the offset sought here.

Other

No.	Submitter	Submission and/or issue	Response to Submission
DWER other 1 Prop RTS 1.2 and 1.3	DBCA	A key consideration in relation to the proposal is the identified transmission power line cable route that intersects portions of Kujungurru Warrarn Nature Reserve and Eight Mile Beach Marine Park. Both are class A reserves, jointly managed by DBCA and traditional owner groups (e.g. Nyangumarta), and vested in the Conservation and Parks Commission and Nyangumarta Warrarn Aboriginal Corporation, under the *Conservation and Land Management Act 1984* (CALM Act). It is recommended that the proponent commence a process to facilitate access to Kujungurru Warrarn Nature Reserve and Eight Mile Beach Marine Park, through the establishment of an easement. It is DBCA's preference that a process to facilitate access to Kujungurru Warrarn Nature Reserve and Eighty Mile Beach Marine Park, through the establishment of an easement, is commenced by the proponent pending confirmation of the appropriate mechanism for land access for the transmission line. If confirmed as appropriate, any easement would need to be granted by the Minister for Lands, to allow activities to be undertaken on these reserves. Management of activities traversing the two reserves will need to be carefully considered in relation to any requirements under the CALM Act and through the formal assessment process under Part IV of the Environmental Protection Act 1986. Recommendation 1: That a condition of approval is applied requiring the development and implementation of a plan for management of impacts on Kujungurru Warrarn Nature Reserve and Eighty Mile Beach Marine Park, to the requirements of the Environmental Protection Authority (EPA) on advice of the Department of Biodiversity, Conservation and Attractions (DBCA). It is DBCA 's preference that a process to facilitate access to Kujungurru Warrarn Nature Reserve and Eighty Mile Beach Marine Park, through the establishment of an easement, is commenced by the proponent pending confirmation of the appropriate mechanism for land access for the transmission line. It is DBCA's understanding that it has no delegated authority to approve easements, as easements are granted under Section 144 of the Land Administration Act 1997.	The proponent acknowledges this and has in fact already been granted the required option to enter into an easement under the *Lands Administration Act 1997* as recommended here (this was actually noted on p48 the ERD). The impacts and management of the trenching required to install the cables have already been carefully considered through Part IV of the *Environmental Protection Act 1986* as embodied in the ERD for the proposal (e.g. p127-128, p141-144, p146 (in particular), p150-151). The EMP for the proposal also sets out the management approaches to the short-term works that are required and ongoing monitoring of rehabilitation, including consultation with DBCA. Approval conditions recommended by the EPA are a matter for the EPA to consider in regards to this submission point, but the proponent would note that as set out in Item 1.2 above, the option to enter into an easement required under the *Lands Administration Act 1997* called for here has already been actioned. The proposal's EMP already includes mitigation measures for the management of impacts on both the Nature Reserve and the Marine Park as identified and quantified in the ERD. The proponent will finalise and implement the EMP under advice from DBCA in respect of any impacts on the conservation estate the easement passes through during construction and operations and ongoing continuous improvement of the EMP. The EMP for the proposal now includes consultation with DBCA and communication protocols around both construction mitigation measures and ongoing operational monitoring. Rehabilitation measures to be implemented will comprise: 1. Temporary storage of topsoil from trenching excavation within the reserve, with topsoil segregated from deeper overburden material; 2. Direct return of overburden material and completion with stockpiled topsoil stored adjacent to the trench as soon as practical completion of the cable installation is undertaken; 3. Follow up monitoring of revegetation success comprising annual traversing and systematic sampling of the 261 m corridor to collect data on revegetation progress; 4. Measuring the data collected under point 3 above against completion criteria to be agreed with DBCA, with remedial works to be undertaken to the satisfaction of DBCA in the even that these are not reached within agreed timeframes; and 5. Annual reporting on the findings of the monitoring, including any remedial actions that may need to be implemented.
DWER Other 2 Prop RTS 1.4	DBCA	The proposal involves direct and potential indirect impacts (e.g. clearing, weeds, fire, etc.) on conservation values within Kujungurru Warrarn Nature Reserve and Eighty Mile Beach Marine Park. A plan for management, required as a condition of approval, would greatly assist in setting out measures to protect conservation values within the reserves and to formalise communications and liaison with DBCA as the current and future land manager of these areas. It is recommended that a plan for the management of impacts on Kujungurru Warrarn Nature Reserve and Eight Mile Beach Marine Park is developed and implemented, on advice from DBCA.	The proponent acknowledges that there is an impact on the Kujungurru Warrarn Nature Reserve, but would like to reiterate that this is – in real terms – very minor: as set out in the ERD (p146) the cable route traverses the Nature Reserve for a total distance of just 261 m and will require temporary clearing of 1.27 ha in total; <0.05% of the reserve by area. The only significant impact mechanism are the temporary vegetation clearing and the risk of weed spread, both of which were addressed in the ERD (p146) and will form part of the proposal's EMP that the proponent will liaise with DBCA on during implementation (Item 1.3 above) The impacts on the Eighty Mile Beach Marine Park were also acknowledged and quantified in detail in the ERD (Sections 4.3 – 4.5), including specifically addressing the Marine Park values and management objectives (p125). As noted in Item 1.3 above, the EMP for the proposal now includes consultation with DBCA and communication protocols around both construction mitigation measures and ongoing operational monitoring. Other management measures to be implemented project-wide, including within the reserve, will comprise vegetation clearing controls, weed hygiene protocols and fire management as detailed in the proposal EMP.
DWER Other 3 Prop RTS 1.8	DBCA	It is currently unclear if horizontal directional drilling was considered as an option for the installation of the transmission power lines at 80 Mile Beach. The utilisation of horizontal directional drilling at Eighty Mile Beach has the ability to avoid/minimise impacts., which may potentially remove the need to trench the transmission power lines below ground, maintaining the integrity of the frontal dune and beach system areas (nesting habitat for marine turtles). It is currently understood that the proponent intends to install two overhead transmission power lines with cables leaving the proposal site towards Eighty Mile Beach. The overhead transmission power line cables will then be buried before heading offshore, initially installed below ground by a process of horizontal It is currently unclear if horizontal directional drilling was also considered as an option for the installation of the transmission power line cables at Eighty Mile Beach. The utilisation of horizontal directional drilling at Eighty Mile Beach has the ability to avoid / minimise impacts, potentially removing the need to trench the transmission power line cables below ground, maintaining the integrity of the frontal dune and beach system areas (nesting habitat for marine turtles) currently identified for impact. Please provide details on whether the use of horizontal directional drilling at Eighty Mile Beach has been considered.	The proposal currently incorporates trenching through the beach habitat present at Eighty Mile Beach, representing a distance of approximately 80 m of potential marine turtle nesting habitat within the approximately 260 km linear extent of beach habitat present within the Marine Park (0.03% of the Marine Park length). As set out in the ERD (p124), the very localised impact of this on marine turtles will be mitigated by construction timing, with the beach works to be conducted outside of marine turtle nesting season. The beach sands would be fully reinstated by the time the next breeding season commenced, with the cables buried at a depth of 5-10 m below ground level. Given this, and that the very flat bathymetry of the near-shore mudflat environment would require a very extensive drilling distance to daylight the cables, the considerable cost of directional drilling is difficult to justify and does not appear to be necessary for the mitigation hierarchy to be observed.

No.	Submitter	Submission and/or issue	Response to Submission
DWER other 4 Prop RTS 2.10	DMIRS	The ERD states that any soil and rock that is removed will be stored on site at convenient locations for re-use within the development area or immediate vicinity where appropriate (section 2.6.3 of ERD, p81). Due to the sheer number of turbines proposed, the estimated total amount of material that has to be managed and stockpiled over time is considerable. Should 'slab type' foundations be used for all turbines (as a worst case) the total amount of rock material is in the order of 1.2 Million m3. Please explain how that material will be managed to minimise any environmental legacies.	This will depend upon the nature of the material excavated and is primarily a geotechnical and civil engineering question. In locations where turbine foundation excavation results in the removal of gravel stratigraphy, this material will be re-used on the site, either as aggregate for concrete or in sheeting access road surfaces. With the track network required for the proposal, and the mildly undulating terrain, road civil works will require fill material to ensure finished roads have a suitable and safe profile: where sand, clay or other suitable material is excavated for turbines that can be adequately compacted for road formation, excavated materials will be used for this purpose. Both of these approaches result in an environmental positive for the project, as this type of optimisation will significantly reduce the need to establish borrow pits or laterite quarries.
DWER Other 6 Prop RTS 5.5	DoEE	The CEMP is too high level and needs to include more defined management measures. Commitments made in the CEMP should be specific, measurable, achievable, realistic and time-bound (SMART). Further guidance on what should be included in management plans is included in the Environmental Management Plan Guidelines, 2014.	As an accredited assessment, the EMP was prepared to primarily meet the Western Australia EPA's current guidance on EMPs. A revised EMP has now been prepared.
DWER other 7 Prop RTS 4.34	DWER	Temporary closures within the Marine areas required for construction, operation or maintenance should be discussed with key stakeholders including, but not limited to, Western Australian Fishing Industry Council Inc. and the Pearl Producers Association.	The proponent agrees to this recommendation, which may be addressed via further consultation and in the implementation of the EMP.
DWER other 8 Prop RTS 9.5	WAFIC	Please explain the relevance of mentioning a fishery which was closed via buy-back in 2013. Please note that there is no recreational take of Pinctanda maxima as stated on Page 28. The Pearling Act clearly notes that you need a licence to take pearl oysters.	The proponent accepts and notes this comment.
DWER other 9 Prop RTS 9.6	WAFIC	Page 39 – It is unclear how the assumption regarding what will/will not impact commercial fishers is when it does not appear that you have either assessed each commercial fishery and quantified the fishery impacts or you have assessed but did not consider publishing the information for commercial fisher review/relevance.	The ERD appropriately describes the risk to marine fauna, including fisheries, posed by the installation, burial and operation of cables; in addition to the mitigation and management measures that will be committed by the proponent to ensure no significant impact on marine fauna/fishery populations. The submitter is referred to p110, 118, 119, 120 and 122 of the ERD, and p28 and 39 of Appendix 3 of the ERD.

Public Comments (Summarised by the Proponent)

No.	Submitter	Submission and/or issue	Response to Submission
Prop RTS 10.1	(ANON-RBF8-P86R-2)	Once again the Dept of Box ticking expects WA citizens to rate a project based on the deliberate 'non provision' of data on which to make a submission.	A very substantial body of data is presented in both the ERD and its 10 technical appendices, using which any member of the public could use to make a submission.
Prop RTS 10.2	(ANON-RBF8-P86R-2)	The collective cumulative amount of destruction of native vegetation, has passed a tipping point. We do not have the rainfall or the groundwater to support the reveg and rehab requirements and have lost millions of rare unique ancients ecosystems, found nowhere else on earth.	This submission point appears to be an opinion of much broader scope than that of the proposal. The cumulative impact of this proposal on native vegetation in the region in question that was considered in the ERD (p150) and will be insignificant.
Prop RTS 10.3	(ANON-RBF8-P86R-2)	The continuous push to exhaust our flora, fauna and finite water to feed shareholders is perverse in the face of the latest UN warning shot, and the irreversible impacts of climate change	This submission point appears to ignore that the proposal is – fundamentally – a renewable energy project that is of sufficient scale to make a significant contribution toward addressing the global-scale issue of climate change (see p55 of the ERD).
Prop RTS 10.4	(ANON-RBF8-P86R-2)	That a foreign company is allowed to abuse our ecology to claim a windfall of renewable energy makes our EPA Act a pointless exercise in bureaucracy	NW Interconnected Power (the proponent) is actually an Australian proprietary limited company, but this has no bearing on the environmental acceptability or otherwise of the proposal for the purposes of the *Environmental Protection Act 1986*.
Prop RTS 10.5	(ANON-RBF8-P86R-2)	There is a good reason the data showing vegetation and water resources is kept from us, the public. Because it (approval of the majority of water abstraction and veg clearing) is totally unsustainable by empirical scientific and social license measures.	The cumulative impact of this proposal on native vegetation in the region in question will be insignificant (p150 of the ERD).
Prop RTS 10.6	(ANON-RBF8-P86R-2)	The default position for projects like these is 'approved in full' so asking for feedback is another disingenuous hoop jumping measure	The EPA follows a stringent and public process of assessment of this, and other, proposals, following well-documented legislation, guidance and policy.

No.	Submitter	Submission and/or issue	Response to Submission
Prop RTS 11.1	(ANON-RBF8-P861-1)	The impact on raptors and other birds doesn't seem to have been considered. 1700+ wind turbines would surely have an dramatic effect on the raptor species in the area. Wind Turbines attract raptors due to their height are and are known to impact and kill them. What mitigation will be deployed to eliminate deaths of eagles and other raptors?	The risk of impact on raptors is actually discussed specifically on p195 of the ERD, concluding that the risk of significant impacts on birds or prey is low. This included a reasoned case citing both the scientific literature relating to operational wind farm monitoring in respect of raptor impacts, and the site-specific data from the surveys of the proposal's development envelope. Mitigation measures for all residual risk for avifauna impacts, including raptors, were also addressed in the ERD (p199-200).
Prop RTS 11.2	(ANON-RBF8-P861-1)	The large amount of clearing would also affect the breeding habitat of the small birds. The proponent should also be required to purchase and revegetate an area equivalent to the area to be cleared	It is not clear what is meant by '*small birds'* in this context, but if the submitter refers to the suite of passerines and other terrestrial avifauna recorded from the development envelope, then impacts on these are actually addressed in the ERD. The habitat loss for the terrestrial fauna assemblage, including avifauna, is – relative to the extent of similar habitat available in the immediate locality – very minor (1.81% of the development envelope alone by area; p180 of the ERD, with very similar habitats occurring much more widely regionally). There is therefore little to suggest that breeding habitat of smaller avifauna will be significantly affected by the proposal to the extent that the type of land purchasing requested suggested here can be justified.
Prop RTS 11.3	(ANON-RBF8-P861-1)	The environmental destruction of this project over such a vast area 662,400ha is unprecedented. We are effectively saying that the environment in our north west is worth only the energy it can produce. We are exchanging energy at the expense of the destruction of the natural environment. This is ironic considering that the project has the "Renewable" moniker and pretends to be for the environment. A project of this scale should not go ahead.	The ERD presents a detailed analysis of potential impacts, including the local, regional and global benefits that would arise. The proposal will deliver intergenerational benefits, including in respect of climate change, with no significant impacts on either the Eighty Mile Beach Marine Park or Ramsar site, the loss of less than 2% of the vegetation and fauna habitats within the development envelope; including avoidance or effective mitigation of impacts on species and communities of conservation significance. Regarding the scale factor raised in this submission: on the contrary – renewable power generation projects of this scale are precisely what is required if any significant progress on global warming and climate change are to be effected by human society. This has also been recognised by other submitters (see Item 9.1, 11.1 and 11.5).
Prop RTS 12.1	(ANON-RBF8-P86V-6)	This renewable energy project's overall environmental impact once completed will be positive given it reduces greenhouse gas emissions proportional to its currently unrivalled size. An environmental risk therefore is that the project is not successfully completed and operated at capacity, failing to reduce emissions. Future, similar large-scale renewable projects may be affected depending on the success of the execution of the Asian Renewable Hub project. How is the risk of project failure, as a potential environmental impact, mitigated?	The proponent agrees that the projects net environmental impact will be positive, once due consideration is given to its long-term benefit in respect of emissions and climate change are recognised. While the proponent acknowledges the point raised in this submission, it considers that the risk raised is more related to commercial risk rather than being an environmental risk.
Prop RTS 13.1	(ANON-RBF8-P864-4)	I would be in favor of such a project if the renewable Energy was staying in our own grid / country. We are absolutely opposed to this project as once again it is a International Company, yes spending money here but for their own need not ours. The EPA should get back to the job of clearly passing project that are home grown for our Solution to Climate Change for Australians.	The project location is not near large population centres, therefore selling all the power to be generated in Australia is not an option. To make the project viable, a mix of international and local customers is required. The many potential domestic benefits are clearly delineated in p54-55 of the ERD and clearly specified as a key component of the proposal on p61 of the ERD (in reference to the Pilbara phase of the proposal). The ERD also identifies that the sequence and priority of domestic supply and downstream processing versus international export is not yet set.
Prop RTS 14.1	(ANON-RBF8-P86S-3)	This is a ridiculous proposal. How can we justify sending green energy to our neighbours (whom I applaud for wanting to use it) when we only have 15% renewable energy usage here? I fully support the use of renewable energy but the domestic market should be the first consumer before international markets. Create the market here and make it profitable for Australian companies to want to sell green energy to domestic consumers.	This submission mostly raises broader economic, municipal power supply and market conditions issues that are more the remit of the government than the proponent. As set out in the response to Item 9.1 above, while international sales of renewable energy are a potential component of the proposal's output, it actually also includes the supply of domestic renewable power and related generation of green within Western Australia, as called for in this submission. This latter domestic benefit is clearly delineated in p54-55 of the ERD and clearly specified as a key component of the proposal on p61 of the ERD (in reference to the Pilbara phase of the proposal). The ERD also identifies that the sequence and priority of domestic supply and downstream processing versus international export is not yet set.
Prop RTS 14.2	(ANON-RBF8-P86S-3)	I cannot see how we can justify placing a pipeline through a marine reserve. What is wrong with this country?	The risks associated with this aspect and the values of the Eighty Mile Beach Marine Park that could potentially be impacted are already evaluated in extensive detail in the ERD, concluding – mostly due to the very localised and short term nature of the disturbance – that they are not significant (p106-108 and p125-126 of the ERD, but with relevant information also documented throughout Sections 4.3-4.5 (p100-126 of the ERD)). The ERD also included a justification for the overall site selection and how environmental values were considered in arriving at the cable route (p72-76 of the ERD).

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Prop RTS 15.1	(ANON-RBF8-P86A-H)	The AREH will have a positive affect on Climate Change. Climate change will be devastating for Australia. As the temperature changes, flora needs time to migrate to more temperate areas. Flora migrates to more temperate areas as they move through their life cycle. Flora can struggle to survive when their life cycle speed is slower than the temperature change. Also insects must move with the plants. The whole ecosystem is disturbed by climate change. Insects will be affected by changes in the flora they depend on. As the flora changes many species of insects will need to adapt and many will not survive such a sudden change. Fauna will be negatively affected by changes in access to water and food. As flora changes Fauna will need to adapt. Many Fauna will not survive such a rapid change. As the world changes from being dependant on fossil fuels to renewable energy the effect of climate change will be reduced. Many flora and fauna species will be saved. The AREH will contribute to saving species.	The proponent agrees with the views expressed in this submission on climate change, its potential future significance for Australian biodiversity, and the importance of acting now to develop renewable energy.
Prop RTS 15.2	(ANON-RBF8-P86A-H)	The AREH will have a positive affect on Construction. The project will provide construction jobs for over 10 years. There will also be operations and maintenance jobs for the entire lifetime of the project. The AREH will provide a positive boost to the economy. The consortium is working with the Pilbara Development Commission to ensure the AREH project delivers maximum economic benefit to the Pilbara.	While the proponent agrees with the benefits of the project's construction on the regional economy as detailed in this submission, the EPA cannot take account of economic factors in its assessment of the proposal.
Prop RTS 15.3	(ANON-RBF8-P86A-H)	Renewable energy is preferable to fission energy sources. AREH will have a lower installation cost, less time to construct, less risk to the environment, no dangerous waste.	The comment is noted and the proponent agrees.
Prop RTS 15.4	(ANON-RBF8-P86A-H)	AREH will provide a great opportunity to strengthen our relationship with our Asian neighbours. International trade represents over 40% of Australia's GDP. Selling affordable renewable energy would increase international trade. Affordable energy would also provide an economic boost to our Asian neighbours	While the proponent agrees with the potential trade benefits detailed in this submission point, the EPA cannot take account of economic factors in its assessment of the proposal.
Prop RTS 15.5	(ANON-RBF8-P86A-H)	The AREH gives us an opportunity to reduce our dependency on fossil fuels. Fossil Fuels contribute to climate change. Australia has a terrible international reputation for remaining dependent on fossils fuels. The AREH is a great opportunity to show the world we do want to invest in renewable energy and reduce climate change.	The comment is noted and the proponent agrees.
Prop RTS 15.6	(ANON-RBF8-P86A-H)	AREH is a real energy solution that can be implemented now. Unfortunately fusion is still decades away. The technology is promising but at this moment in time, AREH is the better choice. Fusion technologies are still underdeveloped. Waiting for fusion tech to become mature is not the answer either. Fusion is still at least 30 years away and with Climate Change having a catastrophic affect on Australia within that time, AREH is the better choice.	While the proponent agrees with the benefits of low cost renewable energy detailed in this submission point, the EPA cannot take account of economic factors in its assessment of the proposal.
Prop RTS 15.7	(ANON-RBF8-P86A-H)	Low cost energy has a huge positive effect on the economy. Low cost energy affects everything; construction, infrastructure, manufacturing, industry. Projects like the AREH that reduce the cost of energy will have a compounded positive affect on Australia year after year. As the cost of solar decreases we will see a surge in efficiency and productivity across Australia. Lower cost of construction of roads and rail, schools, hospitals. The benefits are almost endless.	The comment is noted and the proponent agrees.
Prop RTS 16.1	(ANON-RBF8-P868-8)	On the whole I agree that the proposed mitigation measures mean that any requirements for offsets should be fairly minimal. However, when land of this quality is interfered with then the land should not be thought of as being 'free'. Living things within a functioning ecosystem will be destroyed. There should be a cost. It is with that in mind that I think feral animal control over the whole of the development area would be appropriate. The current plan is only for limited feral animal control. Yes, there will be mitigation costs for other things, but those are associated with ameliorating damage and would therefore not otherwise be required. It seems that assistance with fire control outside the borders would also be good (at cost price?).	The proponent agrees with the view that offsets appear to not be required, and also agrees that the biological values of the development envelope should not be considered 'free' – on the contrary, significant financial investment has already been made by the proponent to collect important data on the biological attributes of the development area, which has substantially improved our overall knowledge of this poorly surveyed locality. The proponent has already committed to feral fauna management in key locations (p196 and p198 of the ERD), but acknowledges the point raised in this submission. In regard to fire management: the proponent has already committed to a significant and high value fire management plan within the proposal development envelope: this in itself will act as a very valuable effective contribution to the issues raised in this submission – resulting in significant landscape scale biodiversity improvements (see p149-150 and Appendix 6 of the ERD). While the cost of fire management in other tenure would not be carried by the project, the implementation of the proposal's Fire Management Plan will include partnering and integrated land management with adjacent land managers outside of the development envelope, consistent with the intent of this submission (Appendix 6 of the ERD).

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Prop RTS 16.2	(ANON-RBF8-P868-8)	My understanding from a talk I attended on trapdoor spiders is that they can live for a long time but tend to form colonies – progeny do not move far from the mother to burrow. Thus it would be a very significant event if a colony of trapdoor spiders was destroyed. Therefore, each site proposed to be cleared should be checked for trapdoor spiders and the development site should be shifted from the proposed location so that it will not impact on such a colony - including its ability to get food. I note that weed control is apparently vital in maintaining food resources for the spiders, since a negative change to the ecosystem reduces the abundance of their prey.	The attributes of trapdoor spiders alluded to in this submission relate to short-range endemism, which is the reason why that taxonomic group was targeted during surveys for the proposal as part of sampling for short-range endemic (SRE) fauna. The significance of SRE fauna in impact assessment as noted in this submission is recognised in the ERD. It must also be recognised though, that not all trapdoor spider species are actually SREs and in fact one of the four trapdoor species occurring in the development envelope was shown to be widespread (p160 of the ERD). Given the small footprint of the project within the development envelope the impact on trapdoor spiders is expected to be negligible. While serious weed invasion could potentially affect an SRE trapdoor spider species, this is not a primary threatening factor for that taxonomic group, and the proponent has already committed to the development and implementation of comprehensive weed hygiene, monitoring and control measures as part of the revised EMP.
PROp RTS 16.3	(ANON-RBF8-P868-8)	Also, it would have been good to have had an image showing the impact of a PVC array.	This actually was provided in the ERD: Plate 2.2 on p51 shows an image representative of a completed PV array, and Figure 2.5 on p60 of the ERD shows a conceptual design of the proposal, including the nominal locations and extent of the PV arrays. Plate 2.11 and 2.12 on p83 also show representative examples of how the PV arrays will be installed. Due to the remote nature of the site, the PV panels will not be visible from public roads, so the only way to see them will be to drive down the Nyangumarta highway, which is only currently used by approximately 1 member of the public every week. As such the visible impact of the solar arrays is negligible.
Prop RTS 17.1	Unknown	I shall be referencing Research Papers in relation to Industrial Wind Turbines. Initially this project was stated in part as consisting of 1,200 Industrial Wind Turbines, each with a combined tower and rotor diameter of 300mt and totalling 5000MW output, which would relate to individual turbines having a capacity of 4.16MW's. These Turbines were to be set out in rows with a 6km separation, perpendicular to predominate wind direction with 750mt pad separation. In May 2019 a request for variation submitted to the EPBC, requesting alterations to the development plan which included additional turbines bringing the total to 1,743 with a hub height of 260mt being 175mt tower height with a rotor diameter of 170mt but no individual MW capacity was mentioned. Changes also included that turbines would be in longitudinal rows spaced 4km apart rather than the original 6km.	This submission summarise the history of the proposal assessment, which does not require a response, other than noting that the proposal turbine row spacing is actually 5 km separation, not 4 km as stated here.
Prop RTS 17.2	Unknown	The application contained environmental assessments which included discussion on noise produced by this form of energy production. A conclusion was proffered that there would be no environmental concerns relating to noise from the turbines as the noise would not extend beyond 4km and the nearest 'receptor' would be at least 15km away. Unfortunately, assessments which the governing bodies and wind industry accept were created at a time when these turbines were small in size and with projects consisting of numbers only just entering double digits and MW capacity per turbine of perhaps no more than 2MW and 12 x 1.8MW turbines were installed at Albany in 2001 prior to Standards being proclaimed which only took account of 'heard' noise and did not contain assessments of Low Frequency and Infra Sound emitted.	As required by the EPA-approved ESD, the noise modelling conducted for the ERD follows current industry standards and regulatory frameworks, including – appropriately – the change in noise predicted for the nearest sensitive receivers. The modelling used data from a suitable representative turbine (in this case the recently released Vestas V150-4.2MW wind turbine). The lack of potential noise impact is not surprising given the proponent took the approach of eliminating noise risks by spacing the turbines far away from potential sensitive receivers.
Prop RTS 17.3	Unknown	There is currently research being undertaken showing the manner in which measurements are taken also needs to change, as well as consideration of not just one turbine but of a projects combined total. If these considerations were adopted it would be a significant change from the current manner in which these projects are assessed as well as causing Noise Standards to be updated. It is possible when a turbine is in operation it also vibrates through the ground – it is a tower with a moving part at the top and that could cause resonance down into the ground and footings of these turbines. How far does this go and is it enhanced by the number of turbines operating in the area? Could the accumulation of sound from 1,743 turbines extend over a much greater distance than a single turbine? Research is advancing relating to how noise is recorded and how multiple turbines could affect the end result. There's also research being conducted into effects of noise produced by these turbines on Humans.	The modelling conducted for the proposal ERD does take account of the total noise generation for the project as a whole, as shown in Figure 4.35 of the ERD (p224). The 1,743 turbines are considered by the model to be operating at maximum noise levels simultaneously, with the result that the noise generated by the turbines will still have attenuated to less than 35db at a distance of approximately 2 km from the nearest turbine (again, see Figure 4.35 of the ERD). The proponent is not aware of any scientific literature or design standards that address ground vibrations of wind turbines as an issue. The proponent is also not aware of any other wind farm proposals that have had ground vibration assessments during the Environmental Impact Assessment process. The density of wind turbines in the proposed project is 2.5 MW/km^2, this is far less than a typical onshore wind farm in Australia (which is typically 5-10 MW/km^2, or 2-3 times more dense than at the proposed project). Given the lack of issues regarding ground vibrations from wind turbines at existing wind farms in Australia, and given the proposed density of the project is 2-3 times less, the proponent cannot see any reason why ground vibration propagation could be a significant issue.
Prop RTS 17.4	Unknown	Next to this project and at the coastal end cables are to be sunk beneath the ocean bed in RAMSAR declared areas. The application for variation shows that a doubling of the number of cables is requested with an increase doubling of the channelling required to take the cables to the beach and to lay it in the ocean floor. The disturbance increase in disturbance for both onshore works and along the ocean bed has not received environmental re-assessment.	The potential impacts of the cable installation and operation in the Ramsar site were addressed in detail in the ERD, including the matters raised in this submission point (Sections 4.3.4 – 4.3.5 and 4.4.4 – 4.4.5). The proposal as considered in the ERD is to include four cables, which was the subject of the environmental assessment.
Prop RTS 17.5	Unknown	There has also been an alteration to the footprint of the project and at one point the project site now abuts the Walyarla Conservation Park which has the RAMSAR protected Mandora Wetlands within it. Still the request for variation does not seem to have gone through any additional environmental updating from the original application.	The ERD has fully assessed the potential impacts of the proposal on the conservation estate, including potential impacts on Walyarta Conservation Park.

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Prop RTS 17.6	Unknown	While the current Noise Standards do not allow for low frequency and infrasound from industrial turbine operations it is becoming more crucial as projects gain in physical and MW capacity that environmental considerations are not taken lightly but are thoroughly assessed and reassessed should alterations to the original applications be sought. If as expected ground vibration is created by the operation of these turbines then consideration should be made for those creatures that not only live above but below ground level as they forage in and around these projects. Noise also travels through water at a greater intensity than through solids, with so many of these turbines being so close to RAMSAR declared areas, including the Swamp could it disturb endangered and non-endangered creatures within those areas. Could the heard and unheard noise deter migrating and local birdlife from foraging in their accustomed environments	The nearest turbine is 26 km from the Eighty Mile Beach portion of the Ramsar site (p31), with the further being more than130km from the Ramsar site. With separation distances of this scale, there is nothing to suggest that detectable vibration propagation will extend beyond the development envelope, let alone the 26 km to Eighty Mile Beach, particularly when the intervening landscape is dominated by loosely consolidated sandplain stratigraphy, which rapidly attenuates ground-borne vibration over short distances. See also Item 17.3 above.
Prop RTS 17.7	Unknown	What about problems of having such an intensive electrical cabling system within a RAMSAR declared area?	The potential impacts of the cable installation and operation in the Ramsar site was addressed in detail in the ERD, including the potential for any indirect impacts from the cabling (Sections 4.4.4 – 4.4.5 and 4.5.4 – 4.4.5).
Prop RTS 17.8	Unknown	As this project is to be constructed in 2 phases over around a 10 year period there should be Environmental assessment of the implications of such a long period of disruption and land clearance to the flora, fauna and avian species that either live permanently in the area or forage and visit during migration periods. Or leave the area altogether causing loss if species in the area.	These questions are already addressed in considerable detail in the ERD and in the supporting technical appendices. The primary focus of ERD itself is the *'…implications of such a long period of disruption and land clearance to the flora, fauna and avian species…'* The reasoned conclusions of the assessment includes the current utilisation of the development envelope by flora and fauna and the potential impacts upon them, concluding that the objectives of the EPA can be met for the Flora and Vegetation and Terrestrial Fauna factors (see p151 and 200 of the ERD, respectively).
Prop RTS 17.9	Unknown	On the first application proponents stated they had included a 6km divide between rows of turbines/solar arrays to ensure the safety of birds flying through. The first question should have been how do these birds know they can fly in a specific 'alleyway' and the next is why are the proponents now asking for a 4km divide?	The ERD presents a reasoned and objective assessment of the spacing of the configuration of the turbine rows in the proposal as now assessed, including reviewing relevant literature and findings from operation wind farms and best practice design (see p185-195 of the ERD), concluding that the spacing as now proposed substantially exceeds best practice spacing in respect of provisioning for bird movement.
Prop RTS 17.10	Unknown	Another aspect of this project includes the inclusion of solar arrays and an additional concern about how Industrial Wind Turbines can alter the hydrology of local areas, this along with the heat attracted by so many solar panels and the air being stirred by operating turbines, as the solar panels and turbines are installed alongside each other in the 'compound'¨ there is a danger for further environmental damage being caused as the area becomes completely 'sanitised' and an increasingly arid environment with all creatures and flora disappearing from it.	The surface hydrology of the development envelope is dominated by sandplains and dunes with rapid infiltration and no permanent watercourses or other water bodies. The proposal will create local alterations to the surface of less than 2% of the development envelope and will have no significant effect on existing surface hydrology (see p231 of the ERD). In regard to the solar panel arrays issue raised here: the footprint of each of the array areas will be completely cleared in any event during the construction period, so the putative heat process suggested here is not relevant. The environmental impact of this loss of habitat for the solar arrays was assessed in the ERD, and, at less than 2%, it is not significant compared to the scale of equivalent vegetation types and habitats within the development envelope and further afield in the locality (see p141 and 178 of the ERD).
Prop RTS 17.11	Unknown	Another concern is that of Cyclones. Previously it has been mentioned the turbines are apparently designed to withstand a cyclone, but what of the Solar panels and their stands, will they be built to withstand a cyclone. Furthermore, what of the accommodation and other infrastructure within the compound will that be erected to withstand cyclones?	All infrastructure for the project, both temporary and permanent, will be designed and certified by a practicing certified structural engineer in accordance with the relevant Building Code of Australia and Australian Standards.
Prop RTS 17.12	Unknown	Also, will there be arrangements made before construction to have methods of recycling and storage of damaged parts of the turbines and solar panels whether from a cyclone or wear and tear or replacement requirements. In both Turbines and especially their blades and in solar panels there is a considerable amount of material that is environmentally damaging and which cannot be recycled. It should also be compulsory for arrangement to be in place PRIOR to approval to construct for the recycling or safe disposal of turbines as they reach the end of their useful life as well as to dispose safely of solar panels and all parts of any structure from the project area. Set arrangements with money set aside for such times for the safe recycling and or disposal of parts of a project should be mandatory.	As documented in multiple locations within the ERD (e.g. p100, 151, 198, 218 and 220) the proponent has committed to the development of a closure plan, including the decommissioning and removal of all infrastructure in an environmental responsible fashion. Operational protocols for the project will also include the recycling of all materials that can be viably recycled during the life of the operation (see p100 of the ERD). Lastly, as again documented on p100 of the ERD, the cost of eventual closure and rehabilitation has been incorporated into the financial modelling for the proposal.
Prop RTS 17.13	Unknown	Finally, consideration should be made for the effects on staff working at the site as one section is completed and operating and the next commences construction, due to noise and vibration, especially as it is clear the research is indicating people can be affected at 'close range' as well at greater distances. The possibility of Work Place injury claims due to the effects of the noise/sounds produced by these turbines in operation mode and the combined heat of the solar panels and hot air being stirred by the movement of turbines could create a significant problem for the company being able to meet their obligations with regards to Health and Safety issues.	The questions raised are, in any event, a matter of risk, mitigation and liability for the proponent to concern itself with, not an environmental consideration for the current assessment under the *Environmental Protection Act 1986,* and the proponent is committed to meeting its obligations under the *Occupational Safety and Health Act 1984* and will fully meet its duty of care to its workforce.

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Prop RTS 7.1	Birdlife Australia	Knowledge about the use of an area can require long-term monitoring to determine the usage of an area by any species. Yet only two short fauna surveys were carried out, one in September 2017 and one in March 2018. For a proposal which would affect such a large area, and which could affect so many species of conservation significance, the ecological surveys were totally inadequate.	The effort and timeframes for the fauna surveys were in accordance with EPA guidance, which does not require *'long-term monitoring to determine the usage of an area by any species.'* to sufficiently characterise the fauna present for environmental impact assessment (EIA) purposes. The ecological surveys were not '*totally inadequate'* but actually characterised the faunal assemblage perfectly adequately. In addition, the only reason the species of conservation significance referred to here are now known from the area is due to the surveys referred to here as inadequate (e.g. the discovery of a new and significant colony of the Black-footed rock wallaby). As set out in sampling adequacy reviews in Appendix 7 of the ERD (p69), comparisons with other reference studies showed the surveys recorded more reptile species than any other individual reference study (or the consolidated list returned from database searches), more mammals species than all but one other past survey from the locality, and as many amphibians as any other study. This reflects the highly experienced zoological team the proponent deployed to undertake the surveys, the effort expended and range of methods used, and the optimal seasonal timing. There appears, then, to be little to support the assertion made in this submission.
Prop RTS 7.2	Birdlife Australia	The surveys were carried out during the day. No attempt was made to assess the use of the area during the night when it is known that most migratory wader flights occur. There has been little attempt to determine whether shorebirds are at risk Little if any attempt was made to determine whether Night Parrots, another threatened species, may be present in the area.	These statements are not true: some parts of the surveys were conducted during the day, but acoustic recording devices were deployed and operational at night over a total deployment effort of 2,340 sampling nights over six months, at 10 locations across the northern half of the development envelope (as detailed in Appendix 8 of the ERD). This was specifically because advice from the Broome Bird Observatory and other ornithologists involved with the surveys was precisely as noted here; that migratory waders generally make flights, and call in flight, at night. This was clearly detailed in Appendix 8 of the ERD (p15). In addition, the terrestrial fauna survey (Appendix 7 of the ERD) included nocturnal spotlighting work and night searches. It is also incorrect to characterise the proponent as making *'little attempt'* to determine whether shorebirds or other fauna species are at risk. This commentary is disappointing, when extensive effort was actually invested, some of which included: • chartering light aircraft and engaging specialists with expertise in aerial bird counts to undertake multiple surveys of the flooded Mandora Marsh and Eighty Mile Beach over a four month period; • funding of the long term deployment and maintenance of the acoustic recording units detailed above, and the analysis of the audio files by a specialist ornithologist; • resourcing the extensive terrestrial fauna surveys for the proposal, including avifauna censuses and targeted searches; and • undertaking comprehensive literature searches and reporting on shorebirds (Appendix 8 of the ERD), and resourcing the completion of a comprehensive risk assessment, again drawing on current literature, as set out in p185-195 and p199-201 of the ERD.
Prop RTS 7.3	Birdlife Australia	One of our major concerns regarding this proposal is the danger posed by the rotor blades of the wind turbines to the bird populations that use this area. This is described by the proponents themselves. While they propose a number of possible remedies, there is no guarantee that they would result in their stated aim of 'No significant impacts on fauna from interactions with wind turbines and associated infrastructure.' (CEMP Table 3.5). Overseas experience has shown that bird mortality due to wind farms is very variable, due to factors including the size of the turbine, the location as to whether it is in a migration path or not, the surrounding geography and the species of birds. Thus, without much more information it is not possible to determine the effect of the wind farm on many significant species.	The ERD does not just *'propose a number of possible remedies'* but takes a much wider – and more appropriate – view of the actual risk of shorebird interaction occurring in the first place, than this submission does. The additional mitigation measures at turbine level (the *'remedies'* here) are only a final layer of contingency response: the primary mitigation is the separation of the wind farm from the main centres of shorebird activity. As set out on p186 of the ERD: '*…the final separation distances are now considerably greater, such that the closest turbine is approximately 26 km from Eighty Mile Beach and 13 km from the southern boundary of the Mandora Marsh at its closest point. This is the geographical context for the closest of the proposed turbines; the separation distance for the vast majority of the wind farm is significantly greater than this, increasing to 132 km from Eighty Mile Beach and 109 km from Mandora Marsh by the time the south-eastern limit of the development envelope is reached. These separation distances of the proposed infrastructure from the Ramsar site are very substantial and represent the primary mitigation of potential bird collision risk for the proposal.'* This key aspect of the proposal seems to have been largely ignored or gone unrecognised in this submission. As detailed in a reasoned and objective sequence in p185-195 of the ERD, it is actually quite possible to arrive at an assessment of the predicted effects, including leveraging wind farm data and findings from overseas as mentioned here, and the ERD already provided a logical review of the variables called for in this submission in arriving at its conclusions.
Prop RTS 7.4	Birdlife Australia	The proponents have supplied a few suggestions about possible mitigation measures that might be used if they feel they are required, particularly for the construction phase, but very few details about their implementation or effectiveness.	This is a diluted representation of the proponent's commitment to mitigation measures, and these will not just be used by the proponent *'if they feel they are required'* as implied: the proponent is committed to all mitigation measures detailed in the ERD and expects they will become legally binding requirements.

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Prop RTS 7.5	Birdlife Australia	In the current proposal the turbines are aligned in straight rows with each turbine placed relatively close to each other, only 800 metres apart. The effect of the straight rows is a hedge with almost 25% of any path through this 'fence' being swept by a rotor blade. The effect of this arrangement seems to aid local 'resident' birds which learn to rely on the open corridors, the effect on mortality of the species likely to be transiting the area only once or twice per season is unknown at the moment.	This submission misses two key elements of the assessment set out in the ERD: that if the principal concern is the potential for shorebirds to move in a generally southerly direction from Mandora March and Eighty Mile Beach, then it is the east-west spacing of the turbine rows that should be being focused on here (not the north-south, within row, spacing of 800 m) – that spacing is over 4 km and consistent with or exceeds best practice spacing from the literature. Secondly, again as discussed in the ERD (p188), the spacing of turbine rows only becomes a consideration if it transpires that in reality significant numbers of shorebirds actually do overfly the site, noting that there is no data demonstrating this at present, and that when doing so, they are flying lower than the rotor swing height - which available data and the substantial separation distances from the Ramsar site suggest is unlikely.
Prop RTS 7.6	Birdlife Australia	Another factor is the size and speed of the rotor blades. It is commonly, but mistakenly, stated that the larger the wind turbine (and hence the swept area) the lower the bird mortality. However it has been shown that that is not the case. What is true is that the mortality per MW goes down. It is better to have a few large rotors than to have many smaller ones. However given the size of this project it could be a major source of bird mortality in the region.	The ERD does not make any statements about direct relationships between size of the rotor blades and avifauna mortality rate, in progressing through its reasoned risk assessment. It is not clear how the size of the project (presumably in terms of generation) is being linked with major bird mortality in the region without any causal basis being articulated, and when taking this in isolation from the other key factors explored in the ERD (overall project siting, separation distances, field data, flight heights, experience elsewhere with row spacing etc.)
Prop RTS 7.7	Birdlife Australia	A mitigation action suggested by the proponents is the use of radar to track flocks of birds moving through the project and switching off single or groups of turbines as required to accommodate the flocks. This is a relatively new approach and its reliability is difficult to determine.	As already discussed, this is not the primary mitigation (see response to Item 7.3 above). This is also actually not an entirely new approach, with radar and related technology already being used elsewhere (e.g. combination of high-definition video, AI and automated bird deterrents[3]), and the proponent considers it likely that it will be reliable, based both on existing data from other operational sites, and that the wind farm will be staffed full-time, allowing for human management intervention when needed (see response to Item 4.24 above for further discussion).
Prop RTS 7.8	Birdlife Australia	The proposal indicates that it aims to 'Minimise risk of fauna interactions with wind turbines' and have an outcome of 'No significant impacts on fauna from interactions with wind turbines and associated infrastructure.' (CEMP Table 3.5). However nowhere does it specify what they mean by 'significant'. They suggest they will implement an 'Avifauna impacts monitoring programme' and measure compliance with their aims. However again, they make no mention of what actions they could or would take if, even after taking the measures they suggest, they fail to comply with their aim of no significant avian mortality.	The term '*significance'* in the context of EIA in Western Australia is determined by EPA (2016c). The proponent also does more than *'suggest'* it will implement monitoring: it is committed to it, and utilising the data in adaptive updates to management. The overall context of consideration here remains that presented in the ERD: that the wind turbines will operate in a desert setting, varying between 26 km and 131 km from Eighty Mile Beach. The overarching risk of significant avian mortality is mitigated by these very large separation distances inherent in the macro-scale site selection, as set out in the ERD, so the objective remains relevant.
Prop RTS 7.9	Birdlife Australia	The proposed wind farm is in the proximity of the Ramsar site which covers Eighty Mile Beach and the Mandora Marsh area. This entire area hosts, at one time or another, a very large proportion of the shorebird populations which migrate between Australia and the northern hemisphere. A proportion of these shorebirds remain resident in the area for the entire summer, moving around the area as required by tidal movement, disturbance and getting access to food.	The proposal is not *'in the proximity of the Ramsar site'*. As detailed in the ERD, it is separated at large scale by 16 km from Mandora Marsh and 26 km from Eighty Mile Beach. The proponent agrees that the Eighty Mile Beach/Mandora Marsh Ramsar site does host very large proportions of shorebirds – this was indeed documented by the proponent's own shorebird surveys (Appendix 8 of the ERD). However, it is essential to recognise that the development envelope for the proposal does not form part of the *'entire area'* referred to in this submission, and none of the shorebird values ascribed to the Ramsar site can be legitimately attributed to the development envelope.
Prop RTS 7.10	Birdlife Australia	Not a lot is known about movement of 'resident' shorebirds around the area during their summer sojourn, but birds moving along the beach are not likely to interact with the wind farm. On the other hand movement between the beach and the Mandora Marsh area could bring them into contact with the wind farm. If they do fly through the windfarm on such short distance flights they are likely to be flying at a low altitude, well within the height range of the spinning blades.	While the proponent agrees that birds moving along the beach will not interact with the wind turbines (not just be *'not likely to interact with the wind farm'*), it is incorrect to state that shorebirds moving between the beach and Mandora Marsh could come *'into contact with the wind farm':* the beach is due west of the marsh, and the wind farm would be 16 km or more to the southeast of the marsh, so there is no logical basis to suggest this. As the development envelope contains no water bodies of significance, is 26 km from Eighty Mile Beach and 16 km south of Mandora Marsh at its closest points, it is extremely unlikely there will be routine movement *'through the windfarm'* by resident shorebirds undertaking short distance flights.

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Prop RTS 7.11	Birdlife Australia	In contrast to these 'resident' shorebirds, many others use this Ramsar site as a staging area before continuing their migration to southern Australia. As pointed out in the environmental assessment, given the location and size of the wind farm, these shorebirds are likely to fly over the proposed footprint of the wind farm. Not a lot is known about such flights and the proponents have provided no surveys on this matter.	The ERD actually concluded that there is little evidence of shorebird use of the development envelope, but a possibility still remains that shorebirds may overfly the development envelope when making larger scale movements toward the southern parts of Australia – it did not conclude that shorebirds *'…are likely to fly over the proposed footprint of the wind farm'*. The ERD appropriately recognised that there are knowledge gaps regarding the routes that migratory shorebirds may follow between northern and southern Australia, but recognising that the entire Australian ornithological research community has not been able to elucidate this since it was first inferred approaching a decade ago (Minton et al. 2011), it is not reasonable to expect that the proponent would have done so in an EIA context. Instead, the ERD made an appropriate wider risk assessment, considering multiple scales and lines of evidence, informed by the key factors and considerations from the literature and the available data. It is also not strictly correct to state that *'no surveys on this matter'* were completed: as detailed in the ERD, Appendix 8 of the ERD, and reiterated multiple times in this response document, acoustic recording devices were deployed for a period of 2,340 sampling nights during the 17-18 shorebird migratory season, primarily to inform this question. The conclusions of that investigation were: '…*there are currently no data demonstrating that any significant number of migratory birds overfly the development envelope, or if they do, they fly higher than the detection range of the automatic recording units deployed for the eight-month period when migratory shorebirds were visiting Australia in 2017-18.'*
Prop RTS 7.12	Birdlife Australia	It is generally accepted, and as pointed out in the proposal, shorebirds of all species, during migration, fly at high altitudes, mostly above 1000 metres, well above the danger zone from wind farms. However this isn't always so. One published account of visual surveys of migrating Knot and Turnstone species in Norway (Alerstam et al. 1990) suggested a lower altitude. They found at two observation points that half the flocks flying past did so at altitudes less than 300 metres. Another study from China (Zhijun Ma et al. 2011) suggested that the migrating bird abundance correlated much better with wind conditions at 300 metres than at greater altitudes, suggesting they were migrating near that altitude.	The literature review completed for the ERD (see Appendix 8 of the ERD) identified that there was variability in the literature on this topic and also that the great majority of migratory shorebirds fly at considerable height. The citations list for Appendix 8 includes over 50 studies – a single study from 30 years ago suggesting a somewhat lower (but unspecified) altitude in one location does not refute the overall body of evidence collated and reviewed for the ERD. The 300 m flight height reported in China by the second study mentioned here is, in any event, above the top most rotor swing of the proposal's turbines.
Prop RTS 7.13	Birdlife Australia	Even if the majority of the migration flight is at very high altitudes, it has been shown that the birds do not necessarily start their migration at that height. They normally take off, and circle, gaining height before heading off on their migration path and gaining height as they go. The initial height can be very variable and potentially bring them into the range of the rotor blades. Then at the end or at intermediate points of their migration, flocks of shorebirds have been observed coming in at altitudes as low as 150 metres before gaining height again to continue on (Alerstam et al. 1990).	The matter of bird flight height is addressed in response to Item 5.4 above, including the question of gaining height on departure. The proponent agrees with this submission, to the extent that the consolidated review and expert opinion was that shorebirds at Eighty Mile Beach have been observed to typically take off, circle, and gain height before heading off on movement paths, gaining further height. However, it must be recognised that this process will occur over 26 km away from the nearest turbine (if departing Eighty Mile Beach) or over 16 km away from the nearest turbine if leaving Mandora Marsh. Initial take off, circling, and gaining height will not occur anywhere near the wind farm and there is no potential to *'bring them into the range of the rotor blades'* during this process, even if one assumes shorebirds do then proceed to actually fly directly over the development envelope. As the end of their movement within Australia is inferred to be in southern parts of the country, the lowering to approximately 150 m elevation on coming in to land reference here, has no bearing on the risk assessment for the proposal's wind turbines.
Prop RTS 7.14	Birdlife Australia	Members of our organization typically see Oriental Pratincoles in flocks of 5,000/10,000s birds in this area, while Menkhorst et al. (year) say "Immense numbers may gather at times: notably in Feb 2004, when 2.8 million congregated on Eighty-mile Beach, n WA." They are most often seen hawking insects on the wing. In the table "CEMP management-based provisions for Terrestrial Fauna." (CEMP Table 3.5) the proposal indicates that "wind turbines designed such that the upper most rotor swing reaches approximately 260 m, with a lower swing limit of approximately 90 m above the ground. This is above the foraging height for the Oriental Pratincole (approximately 35 m or less)." While this might be the average or most common value it is not complete. In the entry for this species, the Federal Government's Species Profile and Threats Database contains the following information; "The species usually feeds aerially, at heights varying from just above the ground up to 300 m (Campbell 1920; Corben 1972b; Garnett 1986; Liddy 1959)" (Species Profile and Threats Database). In fact, under certain circumstances feeding can occur at much greater altitude than normal. This would indicate that migratory shorebirds could well be at greater risk from the rotor blades than the proponents suggest.	It is unclear whether this submission refers to the actual development envelope for the proposal in saying *'this area'*, but the proponent assumes the term is being used far more broadly, considering that the same sentence continues on to consider the number of Oriental Pratincoles at Eighty Mile Beach itself. These latter numbers were already presented in the ERD, but are not representative of the use of the actual development envelope itself by the species: that was 35 individuals compared to the 2.88 million estimated to occur in the flyway population, and even those records were from the western-most portion (approximately 30 km from the coast). As the project area would extend up to 131 km inland, the probability of this species occurring will decrease considerably for much of the proposal's extent. The ERD already addressed the second main point made here, in that while most foraging behaviour of Oriental Pratincole is relatively close to the ground, they may also on occasion engage in thermal soaring behaviour (see p190 of the ERD). The proponent does not agree however, with the manner in which the submission somehow extrapolates this species-specific observation far more broadly to migratory shorebirds in general being at greater risk from turbine rotors.
Prop RTS 7.15	Birdlife Australia	The proponents indicate that flocks could be monitored by radar and individual turbines turned off. While this species (Oriental Pratincole) tends to move around in flocks, hawking and feeding is an individual activity so how effective this strategy would be with this species in this location is unknown. How effective it would it be if the birds are widespread and large numbers of turbines are affected is also unknown. Currently the only way to detect such activity would be actual observers out looking for the birds.	The ERD acknowledged that some uncertainty remains, but as discussed in response to Items 7.7 and 4.24 above, the proponent will be implementing best practice technology solutions to mitigate the residual risk of impacts to avifauna (including the Oriental Pratincole). On-ground observers is actually not the only way in which birds could be detected – see for example the high-definition video, bird deterrent and contingency response system discussed under Items 7.7 and 4.24[4].

[4] https://dtbird.com

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Prop RTS 7.16	Birdlife Australia	The proposal indicates that no suitable habitat for the Night Parrot exists within the proposed wind farm envelope. While this might be true, the nearby Mandora Marshes provide exactly the sort of environment favoured by Night Parrots, as we understand at the moment, with chenopod shrublands and spinifex close by. However even if Night Parrot roosting is within chenopod-dominated shrublands, there is no evidence to indicate they remain within that vegetation type all the time. They may well move out into the wider surrounding areas at night to feed. So while the area is not in the types of area recent specimens have been sighted there is a good possibility that they may be present within the envelope. The very short bird surveys carried out during the biological surveys would probably be quite inadequate to determine whether or not they may occur in the wind farm envelope.	This submission appears to largely agree with the assessment in Appendix 3 of the fauna survey provided as Appendix 7 of the ERD, in concluding that there is no suitable core habitat for Night Parrot within the development envelope. Mandora Marsh will not be impacted at all by the proposal, and is, in real terms, not '*nearby'*, being 16 km from the northern margin of the development envelope at its closest point, and considerably further away from the majority of the proposal conceptual design footprint. So, while it may be true that any putative Night Parrot utilising chenopod shrublands at Mandora Marsh might move into surrounding areas at night to feed, it seems extremely unlikely they would cover more than 16 km and do so on a specific bearing toward the development envelope. The bird surveys conducted for the project were not '*very short'*: as documented in Appendix 7 and 8 of the ERD a combined total of 2,340 sampling nights of automated acoustic recording was undertaken over an approximately six month period. This is in addition to systematic avifauna sampling and non-systematic searches (which included searching for potential Night Parrot feathers in Triodia habitats), night head torching, and road nocturnal spotting, conducted over two well-timed survey phases by a team of six zoologists with considerable experience in the northwest of the state.
Prop RTS 7.17	Birdlife Australia	As stated above the envelope for this project is over 7000 square kilometres and the modified proposal is to clear over 11,000 hectares. The process of building and maintaining the huge amount of infrastructure has the potential to have a huge impact on the ecology of the area. It is our view that the proposed actions should be made mandatory. In addition the proponents should be required to undertake regular ecological monitoring of the area for the life of the project. We do note that the proponents have suggested actions they could take to minimize these impacts. As part of the Construction and Environmental Management Plan, the proponents indicate that they will implement the 'Design and implementation of landscape-scale fire management plan for the construction and operational life of the project' with the aim of the 'active management of the fire regime with the aim of enhancing biodiversity and protecting infrastructure' (CEMP Table 3.4). This could be a positive outcome of the project since they could use their network of tracks to instigate and maintain a mosaic burning programme with traditional owners. This could hugely benefit Bilby, and possibly Night Parrot.	The development envelope for the proposal is actually not *'over 7000 square kilometres'* – its extent is 662,400 ha – and the proponent does not agree that the proposal *'will have a huge impact on the ecology of the area.'* As objectively quantified in the ERD, just 1.81% of the existing habitats present in the study area will be cleared, leaving more than half a million hectares of habitat undisturbed within the development envelope. Those habitats that remain will also be significantly improved in the long term with the shift from currently unmanaged, frequent, hot fires, to the implementation of the proposal's fire management and monitoring strategy. The proponent has already committed to the mitigations actions and ecological monitoring set out in the ERD and its appendices, and expects these to become binding requirements for the life of the project. The proponent does agree, however, with the conclusion here in regard to the planned landscape-scale fire management, including the submitter's assessment of the potential benefit to the Bilby, or even in future: the Night Parrot as alluded to in the submission.
Prop RTS 8.1	Wilderness Society	While there are many potential marine fauna disturbances caused by this proposal, the species most likely disturbed by the cables and trenching of the cable corridor are the Flatback Turtle and four species of sawfish. As Eighty Mile Beach serves as an important nesting site for the Flatback Turtle (Department of Parks and Wildlife, 2014), the proposal, in particular trenching for the HVDC cables, could have a negative impact on the population of Flatback Turtles. The four species of sawfish, Green Sawfish (Pristis zijsron), Dwarf Sawfish (Pritis clavata), Largetooth Sawfish (Pritis pritis) and Narrow Sawfish (Anoxypritis cuspidata), are likely to be impacted by this proposal. The sawfish are likely to be affected by the proposal as trenching for the HVDC cable corridor could impact pupping activities. This could again have a negative impact on the sawfish populations as Eighty Mile Beach is an important area for both immature and mature sawfish (Morgan et al, 2011). In order to mitigate the impact this proposal will have on these species, it has been specified that any cable work undertaken will be between April and July. This will avoid peak turtle nesting and hatchling emergence periods (Australian Government, Department of the Environment and Energy, n.d.). It is assumed that this will also avoid sawfish pupping periods, though not much is known about when this occurs (Australian Government, Department of the Environment and Energy, n.d.). This measure is in line with best practice principles (OSPAR Commission, 2012) and is supported within the literature (Taormina et al, 2018). However, this measure could be improved by requiring external oversight and reporting to ensure that no cable installation, maintenance and decommissioning occurs outside of this time, no matter any delays or circumstances that arise during the undertaking of this project. This time period should also be updated with the release of new sawfish pupping information.	The first two paragraphs of this submission appear to re-state details already summarised in the ERD, and no response is therefore needed. The proponent agrees that the mitigation through avoidance of peak activity periods is an appropriate strategy and consistent with best practice. However, given the short term nature of the works (see response to Item 4.7 above) and the compliance monitoring and reporting already committed to, external oversight is not necessary. The proponent will update the EMP for the project with new information on sawfish pupping as it becomes available.

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Prop RTS 8.1	Wilderness Society	The next impact caused by the proposal is that of electromagnetic field (EMF) generation as the HVDC cables used in this proposal release EMF. The negative effects of this on marine fauna can include impacting elasmobranchs (fish such as sawfish and sharks), marine mammals' navigation, and other species that use EMF behaviorally (Gill, 2005). The proponent has stated that it will mitigate these effects by burying the cables 5- 10m below the seabed in order to reduce EMF generation. This aligns with best practice principles (OSPAR Commission, 2012). However, there are other factors that influence the EMF generation, such as cable orientation and distance from cables (Normndeau, Exponent, Tricas and Gill, 2011). This has not been discussed in the Environmental Review Document, and so it is unclear whether this has been considered and consequently mitigated. These should be researched and included in any subsequent environmental documents. It has been stated in the Environmental Review Document that EMF measuring will only occur soon after the burial. But as it is not clear what the long-term EMF generation and marine fauna effects will be, EMF monitoring should be more frequent to ensure that the level of EMF generation remains negligible, and there is no lasting effect on marine fauna.	The proponent agrees that the mitigation of any potential EMF effects through burial of the cable is an appropriate strategy and consistent with best practice. At a depth of 5-10 m below the seabed, the cable orientation and distance relative to sensitive receiver marine reference here will no longer a significant consideration. EMF generation and any potential propagation through 5-10 m of seabed sediments is a physical phenomenon that will not vary significantly with re-measurement. Assuming that the mitigation by burial and the shielding specification for the cable attenuates EMF as predicted after commissioning, there will be no risk of last effect on marine fauna from this potential impact.
Prop RTS 8.1	Wilderness Society	HVDC cables can further impact marine fauna by heat dissipation during cable operation. It has been found that cables can have a maximum operating surface temperature of up to 70C (Emeana et al, 2016). The issue with buried cables is that this heat can transfer to the surrounding sediment (Emeana et al, 2016). There is very little information about the effect this has, though it can include changes in oxygen concentration profiles and the development of microorganism communities (Taormina, 2018). The proponent has again stated that burying the cables will mitigate the impact of heat generation, which is best practice (OSPAR Commission, 2012). It has also stated that there will be post-installation verification to confirm that there are no elevated temperatures. Like the EMF monitoring, temperature monitoring should be frequent to ensure that no heating of the seabed and surrounding waters are occurring.	As described in Appendix 1 of the ERD, the proponent has committed to a management action and target of burial to ensure no seabed surface elevation of temperature; and monitoring of baseline, during and post installation to ensure the management target is met. As stated in the ERD, heat generation was considered a potential impact during the monopole HVDC Basslink subsea cable operation in Bass Strait, Australia (OSPAR Commission 2009). The external surface temperature of the subsea cable was calculated to reach 30–35ºC, and the seabed surface temperature directly overlying the cables was predicted to rise by a few degrees Celsius at a burial depth of 1.2 m (OSPAR Commission 2009). Emeana et al. (2016) experimentally measured thermal regimes surrounding HV cables within typical unconsolidated shelf sediments - coarse silt, fine sand and very coarse sand - and found: "'*Coarse silts are shown to be purely conductive, producing temperature increases of >10°C up to 40 cm from the source of 60°C above ambient; fine sands demonstrate a transition from conductive to convective heat transfer between cf. 20 and 36°C above ambient, with >10°C heat increases occurring over a metre from the source of 55°C above ambient; and very coarse sands exhibit dominantly convective heat transfer even at very low (cf. 7°C) operating temperatures and reaching temperatures of up to 18°C above ambient at a metre from the source at surface temperatures of only 18°C.*' The above findings measured temperature increases up to a maximum of 1m from the cable source and showed that >10 ºC heat increases were possible at this distance. Prior to installation, as a CEMP commitment (and a component of the temperature monitoring program), the proponent will undertake Finite Element Method simulations of the steady state heat flow regimes and normalized radial temperature distributions for the operational HV cable specification, to confirm the distance at which no temperature elevation will occur. A conservative buffer will then be applied to this distance and a commitment made to cable burial at a depth that has no heat-derived impact on surface sediment biogeochemistry.
Prop RTS 8.1	Wilderness Society	Marine fauna can be impacted through the use of artificial lighting during cable installation, decommissioning or maintenance. As Eighty Mile Beach is an important Flatback Turtle nesting site, the potential negative impacts on the population from the use of artificial lighting could be great. The proponent has stated that work will be 'preferentially conducted during daylight hours' though if artificial light is used, the effects will be mitigated by ensuring that there is 'no unnecessary external lighting'. It is not clear what 'unnecessary' is defined as, or who decides when and what lighting is used. It is also unclear where the artificial lighting will be used, and as it has been found that hatchlings swim towards the light (Wilson et al, 2018), this could have a negative effect if not mitigated properly. As the impact of artificial lighting can be quite devastating on marine fauna, there should be more definitive processes to ensure that artificial light is mostly unused, and specific reporting requirements detailing why there was no other option but to use artificial lighting. This should help to ensure that marine fauna, particularly the Flatback Turtle, is not impacted by this proposal. The impact that artificial lighting has on Flatback Turtle hatchlings further demonstrates the need to ensure that work is not completed during nesting and breeding times.	The proponent does not agree that *'…the potential negative impacts on the population from the use of artificial lighting could be great'*. The individual turtles that nest at the Eighty Mile Beach rookery are part of a much larger northwest shelf population and there is no risk that the proposal will have any detectable impact on the population. The proponent has already committed to conducting the cable installation works outside of the nesting and breeding season for Flatback turtle, which will avoid all significant potential impacts of light causing misorientation or disorientation of either breeding adult or hatchling Flatback turtle, so the requested additional detail and reporting is not warranted. The additional mitigation measures of preferentially conducting work during daylight hours, and limiting external lighting if any night works are needed, only represent a final layer of mitigation for the short-term period of the works outside of the breeding season, when adult Flatback turtles may possibly be foraging in the area. Any behavioural effects that might arise at that time will be short term, individual-based, and have no influence on breeding success at the rookery, as it will be outside of breeding season.
Prop RTS 8.1	Wilderness Society	Another impact of HVDC cables is the potential for chemical pollution (Taormina et al, 2018) or contamination (OPSASR Commission, 2012). However, there is no mention of chemical pollution or the release of harmful substances during cable installation or operation in the Environmental Review Document. As this is a recognised potential impact, it should have been considered by the proponent originally. This should be rectified and the issue of chemical pollution should be researched.	The ERD actually does address these issues: the risk of existing sediment contamination being mobilised during installation and the risk of cable degradation over time resulting in chemicals being released into the environment were both addressed on p109-112 of the ERD. Neither is considered likely to present any significant risk to the marine environment (see p112 of the ERD).

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Prop RTS 8.1	Wilderness Society	The vegetation of both these land systems is dominated by Triodia hummock grasslands which are very flammable and the frequent and widespread fires will reduce the diversity in the landscape. Currently there is no weed invasion in the development envelope but with the proposal involving the construction and operation of control center which also includes accommodation of 300-1,000 workers for 1-2 year, there are higher risks of weed introduction and spread and increased fire due to human activity. The altered fire regime caused by development activity results in habitat simplification and degradation, and lead to decline and extinction of medium size mammals in the semi-arid and arid zones due to increased predators (EPA, 2006). The main vegetation Triodia hummock grasslands are also susceptible to physical damage from vehicle movements and may take extended periods to recover.	The proponent largely agrees with this submission, which for the most part reiterates observations from the ERD. There appears to be little to respond to, other than noting that: • the entire basis of the proponent's fire management for the proposal is to address the existing uncontrolled, too hot and too frequent fire regime; • the risks associated with weed introduction and their mitigation were well recognised in the ERD (see response to Item 4.17 above); and • construction and operational personnel will be prohibited from off-road driving and vehicle movements will not present an impact to Triodia.
Prop RTS 8.1	Wilderness Society	About 1.27 ha of the Nature reserve will be cleared to install the cables which will later be rehabilitated. "The vegetation that has been systematically sampled during the first survey phase is representative of the range of units present in the wider development envelope" (Referral supporting information, 2017, p.27). The first survey was conducted between the 24th of August and 4th of September 2017 which is a dry season and thus it is not appropriate to consider the vegetation from the survey to represent the range of vegetation present within the development envelope. The Wilderness Society recommends that a detailed vegetation and flora survey should be conducted in the study area in wet season rather than assuming the vegetation type from the survey conducted during the dry season.	The Detailed vegetation survey called for in this submission was actually carried out – including post-wet sampling – as documented in Appendix 5 of the ERD.
Prop RTS 8.1	Wilderness Society	The referral supporting information (2017) states that "Priority flora species appeared relatively common within the development envelope and are also known from previous records from elsewhere in the northern Pilbara and southern Kimberley regions" (p.18). The existence of these floras in more than one location does not render it unworthy of protection in the development area. The Wilderness Society recommends that the proponent avoid clearing of threatened and priority flora species at all cost.	It is unclear why this submission refers to the referral supporting information from 2017, when the issue of Priority flora and their wider distribution and conservation status was far more substantially assessed and addressed in the 2018 flora and vegetation report (Appendix 5 of the ERD). The proponent has committed to avoiding Priority flora in the final design where practicable (see also response to Item 4.16 above, however, in regard to the contention that very widespread species, that realistically no longer meet the criteria to be Priority flora, should be avoided *'at all cost'*).
Prop RTS 8.1	Wilderness Society	The Wilderness Society recommends the development of comprehensive framework to identify fire management thresholds and weed invasion for conservation of flora and fauna and implement sustainable fire regimes to avoid declines in threatened species.	The proponent has already committed to the development of a comprehensive fire management and monitoring strategy.
Prop RTS 8.1	Wilderness Society	Cable burial is preferable to the cable being laid on the seabed, in order to ensure that any change or impediment to natural sediment distribution in the future is temporary (NIRAS 2015, p.22). However, cable burial impacts marine environment greatly in the short-term, increasing turbidity through the disturbance of sediment. This will impact water quality, increasing turbidity and thus affecting marine flora and fauna.	The proponent agrees that cable burial is preferable to laying the cable on the seabed, for multiple reasons. The risk of turbidity increases and changes to water quality affecting marine flora and fauna was assessed in the ERD (p106-108) and found to be very short term and negligible, given the nature of the surrounding marine habitats.
Prop RTS 8.1	Wilderness Society	Cable degradation and waste from cable-laying vessels may also impact sediment quality, leading to the potential release of contaminants when the cable is later exposed for recovery or maintenance (Meißner et al. 2006, p.60). Although the proponent has posited that cables are unlikely to require repair work, thought should be given in how to manage any contamination that may occur as a result of degradation, and what the clean-up process would look like in this event, given that removal or exposure of the cable could lead to wide-spread contamination through sediment spread.	The proponent maintains that the need for extensive maintenance is relatively unlikely, the point raised here is acknowledged however, and the proponent will develop monitoring and management protocols in future revisions of the EMP to assess if this will be a significant issue, and mitigate if so, in the event that more significant cable maintenance proves necessary in future years.
Prop RTS 8.1	Wilderness Society	The review notes that anodes, which can release chlorine into the water, are not being used in the Marine Park waters and so impacts have not been fully explored. However, environmental impacts associated with the use of anodes should still be considered, as they produce chlorine gas in the surrounding sea water through electrolysis, which then reacts to cause hypochlorous acid, both of which have the potential to adversely affect marine life outside the park, which will impact flora and fauna inside the Marine Park. This is a gap in the review that should be rectified.	There is no reason to consider chlorine gas production from anodes, when – as stated in the ERD – there will be no anodes within the development envelope.
Prop RTS 8.1	Wilderness Society	The use of cable shielding and the depth of cable burial will likely to mitigate many of the impacts from electromagnetic fields and heat emission. The Proponent should ensure that the cable shielding is above standard, given that the cables are going through a Marine Park.	The mitigation of EMF and heat emission has been discussed in response to Items 8.2 and 8.3 above, in addition to being considered in the ERD (p119-125). Appendix 4 of the ERD provides the proposed specifications of the cable.
Prop RTS 8.1	Wilderness Society	The Black-footed rock wallaby (Petrogale lateralis lateralis) is a Schedule 2, endangered native mammal species at the State and Commonwealth levels. The discovery of a previously unknown colony of black-footed rock wallabies along the northern edge of the development envelope is a good outcome from the field survey. As habitat of rock outcroppings are critical for this species' survival, associated rock outcroppings, caves, and crevices in the development envelope must be avoided to ensure population survival. Conservation management of this species must align with Western Australian Wildlife Management Program No. 55, a federal recovery plan for five species of rock wallabies (Pearson, 2019).	The proponent acknowledges this comment and agrees with the value of the survey outcome in regard to Black-footed rock wallaby. The proponent has already committed to the avoidance of impacts on rock pile habitat as called for in this submission (see also response to Item 4.26 above), and will also implement fire management and feral fauna control, consistent with the objectives of broader management programmes for rock wallaby.

No.	Submitter	Submission and/or issue	Response to Submission
Prop RTS 8.1	Wilderness Society	The northern quoll (Dasyurus hallucatus) is a Schedule 2, endangered native mammal species at the State and Commonwealth levels that was recorded in the development envelope. Rocky areas provide prime habitat for northern quolls (northern quoll plan) as do ruggedness or topographic complexity. Thus, retaining the rocky, rugged outcrops on the site would align with protecting this endangered species. Conservation management of the northern quoll must adhere to the National Recovery Plan for the Northern Quoll (Hill and Ward, 2010).	There is currently little evidence of any significant numbers of Northern Quoll within the development envelope (see Appendix 7 of the ERD). In the event more individuals do occur, they would be very likely to be associated with the rock pile habitat at which the Black-footed rock wallaby was recorded – as this will be avoided in the design anyway to mitigate impacts on that species (see Item 8.14 above), potential Northern Quoll habitat will also be retained.
Prop RTS 8.1	Wilderness Society	The greater bilby is a Schedule 3, vulnerable native mammal species at the State and Commonwealth levels that was recorded in the development envelope. As bilby populations in WA are known to occupy open hummock grassland habitats, it is recommended that the associated gravelly lateritic rises that support open hummock grasslands are left undisturbed in order to maintain species survival.	Open hummock grasslands of one sort or another actually account for virtually all of the fauna habitats of the development envelope (see Appendix 7 of the ERD). Areas where these are adjacent to laterite rises can be important for the Bilby, but it is considerably more important to ensure that a mosaic of suitable age since last burn vegetation is present within the development envelope, which the proposal's Fire Management and Monitoring Strategy will address.
Prop RTS 8.1	Wilderness Society	The use of a prescribed burning program to 'naturally' relocate the Bilby populations from the land clearing and development envelope is not recommended for those species that occur in hummock grasslands due to the number of surrounding development applications in the area. Continued relocation of Bilby populations with each and every development application would see the Bilby out of home in its own native habitat. The reassessment of the development envelope to support bilby populations is recommended.	This issue of fire management has been addressed in detail in response to Items 4.25 and 5.3 above. Regarding the comment: '*Continued relocation of Bilby populations with each and every development application would see the Bilby out of home in its own native habitat '*, it seems that it may not have clearly understood that the Bilby will not be displaced from the proposal's development envelope. On the contrary: the objective of the proposal's fire management is to create a mosaic of patches of differing fire age vegetation that will benefit the Bilby and provider higher quality habitat accessible to the existing population. Considering that over 98% of the development envelope will not be cleared for the proposal, there will be no broad-scale relocation as suggested.
Prop RTS 8.1	Wilderness Society	Further research and consideration needs to be given to the undescribed trapdoor spider species to determine if they are indeed short-range endemics (SREs). Invertebrate SREs are vulnerable to extinction due to their inability to disperse. As Biota is unsure whether the species are more widely distributed or SREs, further investigation must be conducted to avoid putting undue pressure on a potentially vulnerable population.	The current conceptual design for the proposal does not impact on the locations from which the potential SRE trapdoor spiders were recorded, and this mitigation will be maintained through the final design. The Biota report also concluded that, given the nature of the habitats and the lack of geographic barriers that might promote short-range endemism, it is relatively unlikely that the species in question are actually true SREs.
Prop RTS 8.1	Wilderness Society	Eighty Mile Beach is one of the world's most important feeding grounds for small, wading migratory birds (parks). As six out of seven of the native, conservation significant species are listed within this management program (Bar-tailed Godwit, Eastern Curlew, Curlew Sandpiper, Lesser Sand Plover, Red Knot, Greater Sand Plover) and 37 internationally important migratory bird species are found on the site, proposed development on the Eighty Mile Beach site must align with state, federal, and international conservation plans.	There is no proposed development on the Eighty Mile Beach Ramsar site of any significance or lasting impact. The only direct impact on Eighty Mile Beach is very spatially-limited and short-term disturbance of the cable installation, which will be conducted outside of peak migratory shorebird season, and there is no impact on the Mandora Marsh part of the site at all.
Prop RTS 8.1	Wilderness Society	Additionally, the conservation-significant Oriental Pratincole (Schedule 5, protected under international agreement and migratory) was recorded actively utilizing the area within the development envelope. Further observation to whether this species will have a suitable alternate habitat to relocate is recommended.	As detailed in the ERD, 35 individuals of the Oriental Pratincole were recorded from the development envelope. As this compares to an estimated population of 2.88 million Oriental Pratincole that utilise Eighty Mile Beach, Mandora Marsh and other near-coastal environments in the region, it is very clear that suitable alternate habitat for the species exists.
Prop RTS 8.1	Wilderness Society	TWS recommends that the development envelope be reassessed due to the habitats within that are necessary and significant for endangered and vulnerable indigenous fauna as listed under Schedule 5 of the EP Act for Native vegetation clearing in Western Australia. Additionally, TWS recommends the creation of a fauna management program to adhere to the national fauna management programs mentioned above as well as to reduce the chance of further population decline for the many conservation-significant species at risk within the development envelope. TWS recommends that the proponent be required to create environmental offsets including rehabilitation and revegetation for habitats that endangered, priority, and vulnerable native fauna are associated with within the development envelope.	It is unclear on what basis this request for reassessment of fauna habitats is being made: a comprehensive terrestrial fauna survey, consistent with EPA guidance, has already been completed by zoologists with experience relevant to the locality (see Appendix 7 of the ERD). It was, in fact, this work that revealed that fauna of conservation significance were present (which are more relevantly listed under the *Biodiversity Conservation Act 1999*, rather than Schedule 5 of the *Environmental Protection Act 1986*). The ERD already sets out in detail the various fauna management initiatives that the proponent has committed to, ranging from landscape scale fire management to benefit fauna habitats and assemblages, road and infrastructure diversions to avoid impacts on Black-footed rock wallaby, avifauna monitoring and response protocols for turbines, feral fauna management, and other general site management measures of benefit to fauna. No further management program need be created beyond this.
Prop RTS 8.1	Wilderness Society	TWS recommends clarifying borders of the development envelope in relation to Aboriginal heritage sites (both registered and pending) in the area in order for stakeholders and the public to ascertain the potential effects on Aboriginal heritage. TWS also recommends the proponent giving easily-accessible stakeholder meetings for traditional owners and Elders that offer regular updates on project development, input and feedback avenues, and translation services for indigenous languages. The Karajarri, Nyangumarta, and Ngarla people are recognised as the traditional owners of Eighty Mile Beach Marine Park, an internationally-important wetland under the Ramsar Convention. Development and construction conducted on Eighty Mile Beach must be done with social and cultural acceptance from these traditional owners.	As detailed in the ERD, all known sites of Aboriginal heritage importance have been avoided by the current conceptual design, and the proponent has committed to adjusting the final design to avoid impacts on any future sites that may be discovered. The proponent has engaged with the Nyangumarta people and regularly consulted with them over the long-term development of the proposal, including working toward an Indigenous Land Use Agreement, and is committed to ongoing involvement of the traditional owners.
Prop RTS 8.1	Wilderness Society	TWS agrees with the proposal's concern for large bushfire outbreaks and the need to mitigate such outbreaks. TWS recommends this be done through a regular, low-intensity burning program conducted through local Aboriginal corporations and community organisations as they would offer the best result for supporting the landscape and its native flora and fauna. A low-intensity, traditional firing regime would also offer the best protection against an induced fire from getting out of control.	The proponent agrees with this submission and will be implementing fire management consistent with these views, including the ongoing involvement of the Nyangumarta people, as committed to in the ERD.

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