Invertebrate Solutions

22nd April 2026
Dr Tim Moulds
Director Invertebrate Solutions
Suite 19, 18 Stirling Highway,
Nedlands, WA, 6009
Reference: 2026SJ05-02-F01-20260422
Your Reference:

NBT-WGA 132 kV Line Project– Short Range Endemic Invertebrate Fauna Impact Assessment.

Attention Jemma Kirke
Senior Environmental Advisor
Western Power

Dear Jemma,

The following technical memorandum is in response to the request by Western Power on 4th March 2026 to provide an impact assessment for high likelihood short range endemic (SRE) and conservation significant invertebrates for NBT-WGA 132 kilovolt (kV) Line in the northern Swan Coastal Plain (SCP).

Introduction

This technical memorandum has been prepared for the Electricity Networks Corporation (Western Power), to accompany environmental referral documents for the Wangara to Neerabup Terminal 132 kilovolt (kV) Overhead Transmission Line project (the Project) under Part IV of the *Environmental Protection Act 1986* (EP Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Proposal is located 17.5 km north of Perth CBD in the City of Wanneroo and includes the construction of a dual circuit 132 kV transmission line from Neerabup Terminal to intersect an existing transmission line (MUL-WGA 81) at the Wangara Substation, a length of approximately 23 kilometres (km). Enabling works will occur along the proposed line route, involving the relocation and/or undergrounding of existing distribution lines and utility assets to facilitate the construction and future operation of the new 132 kV transmission line.

To support the environmental assessment process, Western Power has requested Invertebrate Solutions Pty Ltd (Invertebrate Solutions) to undertake a desktop assessment for SRE and conservation significant invertebrate fauna, within the Project Development Envelope (PDE).

This report has been prepared with regard to the Technical Guidance – Sampling of short range endemic invertebrate fauna (EPA 2016).

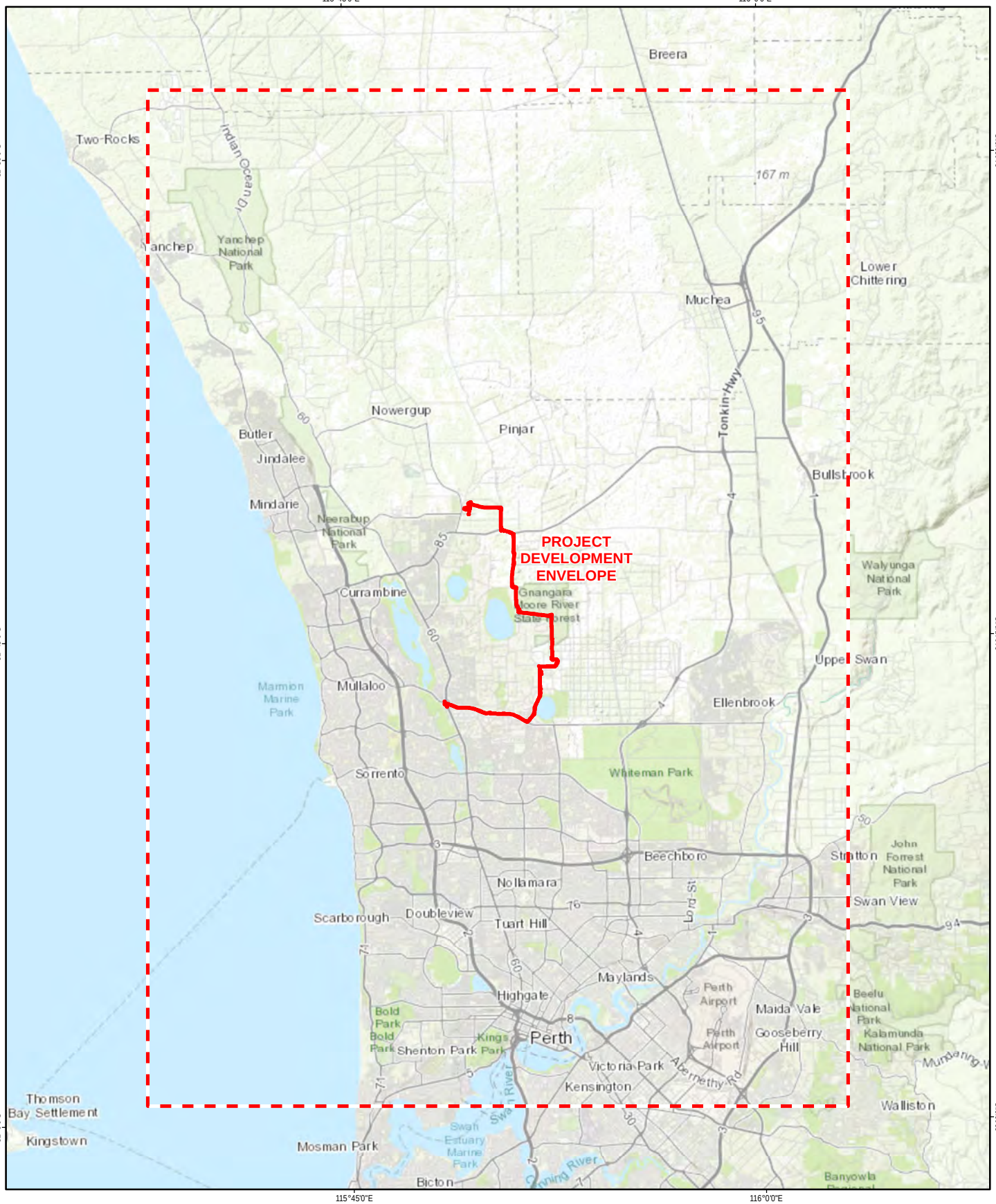
NBT-WGA 132 kV Line – Existing Environment

A desktop assessment of the PDE was undertaken by Invertebrate Solutions (2026a). The Desktop Study Area boundary and the PDE are shown in Figure 1.

The Desktop Study Area contains three Confirmed SRE species with multiple occurrences of each species within the Desktop Study Area. An additional seven species were identified within the Desktop Study Area as being Likely SRE species (Table 1). The remaining species identified from desktop resources were found to be widespread and not SRE species. Two Confirmed SRE species, the millipede *Antichiropus whistleri*, and the mygalomorph spider *Idiosoma sigillatum* identified during the desktop search had a High Likelihood of occurring within the PDE (Table 1).

Five key SRE and conservation significant invertebrates were identified within the Desktop Assessment (Invertebrate Solutions 2026a) with High or Moderate likelihood of occurrence based upon desktop information. These were subsequently assessed as part of a targeted survey in March and April 2026 (Invertebrate Solutions 2026b). The five species along with their updated likelihood of occurrence, following the targeted survey are listed below:

- *Hesperocolletes douglasi* (BC Act Critically Endangered, EPBC Act Critically Endangered) – Low Likelihood;
- *Hylaeus globuliferus* (DBCA Priority 3) – Moderate Likelihood;
- *Leioproctus contrarius* (DBCA Priority 3) – Low Likelihood;
- *Antichiropus whistleri* (Confirmed SRE / No conservation status) – Moderate Likelihood;
- *Idiosoma sigillatum* (DBCA Priority 3) – Low Likelihood;



Legend

- Desktop Study Area
- Project Development Envelope

0 2.5 5 10 km

Scale: 1:300,000 @ A4

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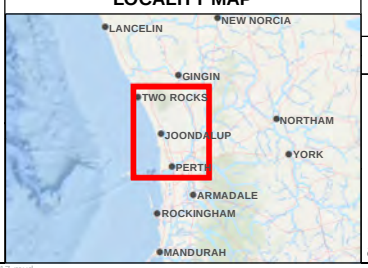
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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HORIZONTAL DATUM & PROJECTION	DATE
GDA2020 MGA Zone 50	17/02/2026

PROJECT
NBT-WGA 132kv Line

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ENVIRONMAPS	TM	TM	0

Western Power

Figure 1

Project Development Envelope and Desktop Study Area

C:\GIS\Jobs\Invertebrate Solutions\NBT-WGA 132kv Line - SRE Desktop\Figures\NBT-WGA_F01 Project Development Envelope and Desktop Study Area_260217.mxd

Table 1 SRE and conservation significant Invertebrates recorded from the Desktop Study Area and Targeted Survey.

Higher Classification	Genus and Species	SRE status	DBCA / BC Act Conservation Status	EPBC Conservation Status	Fauna habitat present in PDE	Desktop likelihood of species within the PDE	Likelihood of occurrence following Targeted native bee and mygalomorph spider survey (Invertebrate Solutions 2026b)
Gastropoda							
Succineidae	*Succinea contenta*	Confirmed	-	-	Banksia woodland; Mixed shrubland	Low	Low
Crustacea:							
Isopoda							
Armadillidae	*Buddelundia cinerascens*	Likely	-	-	*Adenanthos*/ Plantation; *Banksia* Woodland; Mixed shrubland; *Melaleuca* woodland	Low	Low
	Buddelundia inaequalis	Likely	-	-	*Adenanthos*/ Plantation; *Banksia* Woodland; Mixed shrubland; *Melaleuca* woodland	Low	Low
	Buddelundia opaca	Likely	-	-	*Adenanthos*/ Plantation; *Banksia* Woodland; Mixed shrubland; *Melaleuca* woodland	Moderate	Moderate
Arachnida							
Mygalomorphae							
Barychelidae	*Synothele lowei*	Likely	-	-	*Banksia* Woodland; Mixed shrubland; Trees over cleared	Moderate	Low
	Synothele michaelseni	Likely	-	-	*Banksia* Woodland; Mixed shrubland; Trees over cleared	Moderate	Low
	Synothele taurus	Likely	-	-	*Banksia* Woodland; Mixed shrubland; Trees over cleared	Moderate	Low
Idiopidae	*Idiosoma sigillatum*	Confirmed	Priority 3	-	*Banksia* Woodland; Mixed shrubland; Trees over cleared	High	Low
Diplopoda							
Iulomorphidae	*Dinocambala ingens*	Likely	-	-	Not Present	Low	Low
Paradoxosomatidae	*Antichiropus whistleri*	Confirmed	-	-	*Adenanthos*/ Plantation; *Banksia* Woodland; Mixed shrubland; *Melaleuca* woodland	High	Moderate
Insecta							
Lepidoptera	*Synemon gratiosa*	Widespread	Priority 4	-	Not Present	Low	Low
Hymenoptera	*Hesperocolletes douglasi*	Widespread	Critically Endangered	Critically Endangered	*Adenanthos*/ Plantation; *Banksia* Woodland; Mixed shrubland; *Melaleuca* woodland; Trees over cleared	High	Low
	Hylaeus globuliferus	Widespread	Priority 3	-	*Banksia* Woodland; *Adenanthos*/ Plantation; Trees Over Cleared	High	Moderate
	Leioproctus (Glossurocolletes) bilobatus	Widespread	Priority 2	-	Not Present	Low	Low
	Leioproctus contrarius	Widespread	Priority 3	-	Trees Over Cleared	Moderate	Low
	Leioproctus douglasiellus	Widespread	Critically Endangered	Critically Endangered	Not Present	Low	Low
	Neopasiphae simplicior	Widespread	Critically Endangered	Critically Endangered	Not Present	Low	Low

Potential Impacts to SRE and conservation significant invertebrate Fauna

The potential impacts of development on invertebrates may be categorised as:

- Direct impacts; and
- Indirect impacts.

Direct impacts are the obvious and unavoidable destruction or degradation of habitat, generally native vegetation that occurs due to clearing and earthworks (e.g. infrastructure areas etc.). Indirect impacts are generally gradational, and more difficult to predict and manage because they may occur at moderate to large distances from the project footprint. These impacts may be expressed some time after development has begun.

The zone of influence for indirect impacts may be considerably larger than areas of direct impact. Potential indirect impacts of development include:

- Risk of extinction from reduction and/or fragmentation in habitat;
- Alteration of surface hydrology regimes, sedimentation, and water quality (e.g. under and proximal to roads and infrastructure);
- Surface water contamination from equipment and infrastructure; and
- Vibration disturbance from operational activities.

This impact assessment is based primarily upon and the project components as outlined by Western Power and in the Introduction, with the main components of the Project reviewed to assess the potential severity of impact to potential SRE habitats. In evaluating the relevance of these factors to the Project, consideration was given to the magnitude, duration and spatial extent of the impacts, where known. This assessment has taken the approach of considering these broad categories of potential impacts and evaluating their occurrence and relative severity. The impacts were then assigned a level of either 'Low', 'Moderate', or 'High' according to their potential degree to adversely affect the EPA's objective to maintain representation, diversity, viability and ecological function at the species, population and assemblage level for SRE fauna.

Where an impact is designated as 'Low' no further consideration to this factor is required if all assumptions made throughout this report are correct.

NBT-WGA 132 kV Line Project SRE and conservation significant invertebrate fauna impact assessment

This impact assessment is based primarily upon the Project description provided in the Introduction and within Invertebrate Solutions (2026a) and focuses on the five key SRE and conservation significant invertebrates that have been identified using desktop resources as having a High or Moderate Likelihood of occurrence within the PDE. The targeted invertebrate survey (Invertebrate Solutions 2026b) further refined the likelihood of occurrence for these five species based on field assessments and survey results.

Local impacts during construction and operation

The potential impacts to SRE and conservation significant invertebrate fauna within the PDE are summarised in Table 3. The assessment of the impact to SRE and conservation significant invertebrate fauna at both the local and regional (SCP region) scale from each disturbance mechanism takes into account both the likelihood of the impact occurring, its duration and severity, the potential consequence to SRE fauna and the likelihood of SRE and conservation significant invertebrate fauna being present.

Direct impacts

The direct impacts to SRE and conservation significant invertebrate fauna is from vegetation clearing within the PDE (Table 2). The direct impact of vegetation clearing on SRE and conservation significant invertebrate species is considered overall to be Low due to the small clearing footprint of approximately 37.71 ha for the project. This is further refined for the five key species identified in the Existing environment (Table 1) with areas for differing species' habitat removal (Table 2). Much of the proposed alignment is previously cleared or is planted revegetation that is not suitable for SRE or conservation significant invertebrates such as *Idiosoma sigillatum* that is slow to recolonize any areas where prior ground disturbance has removed populations (Invertebrate Solutions 2026a, Figure 3).

Table 2 Clearing impact by area for the five key species by vegetation type

Vegetation unit	*Hesperocolletes douglasi*	*Hylaeus globuliferus*	*Leioproctus contrarius*	*Antichiropus whistleri*	*Idiosoma sigillatum*
***Adenanthos*/ Plantation**	2.14	2.32	2.14	2.32	2.14
Mixed shrubland	0.18	1.43	0.18	0.18	0.18
***Banksia* Woodland**	0.13	0.13	0.13	0.13	0.13
***Melaleuca* woodland**	-	0.3	-	0.3	-
Trees over cleared	-	0.49	-	-	-
Total Ha	2.45	4.67	2.45	2.63	2.45

***Hesperocolletes douglasi* (EPBC Critically Endangered)**

Habitat for the native bee species *Hesperocolletes douglasi* is poorly known, however, the available habitat for this species within the largely cleared PDE is extremely limited and at most comprises 2.45 ha in nine small individual patches, mainly along the northern most corridor (Figure 2, Table 2). The most likely habitat for *Hesperocolletes douglasi* when considering the PDE is within undisturbed Banksia woodland that is adjacent to,

but not being cleared by the project (Figure 2). The avoidance of clearing of this key habitat will substantially minimize any impacts to SRE and conservation significant invertebrates that may occur within or immediately adjacent to the PDE. This species is considered to have a Low likelihood of occurrence within the PDE based on the outcomes of the targeted field assessment.

***Hylaeus globuliferus* (DBCA Priority 3)**

The native bee *Hylaeus globuliferus* is strongly associated with *Adenanthos cygnorum* and *Banksia attenuata* that occurs both within remnant native vegetation and revegetated areas along the southern portion of the PDE. These occurrences of mainly *Adenanthos cygnorum* provide up to 4.67 ha of habitat within the PDE (Table 2), however, the avoidance of Banksia woodland that is adjacent to, but not being cleared by the project provides far better habitat than is available within the PDE. This species is considered to have a Moderate likelihood of occurrence within the PDE based on the outcomes of the targeted field assessment.

***Leioproctus contrarius* (DBCA Priority 3)**

Habitat assessed as potentially suitable for the native bee *Leioproctus contrarius* is considered to be minimal and at comprises of up to 2.45 ha (Table 2, Invertebrate Solutions 2026b). This species is considered to have a Low likelihood of occurrence within the PDE based on the outcomes of the targeted field assessment.

***Antichiropus whistleri* (Confirmed SRE)**

The Confirmed SRE millipede *Antichiropus whistleri* potentially occurs in up to 2.93 ha of native vegetation (Table 2), mainly in the northern portion of the PDE, where deeper accumulations of leaf litter that retain moisture may occur in existing vegetation. This species is considered to have a Moderate likelihood of occurrence within the PDE based on the outcomes of the targeted field assessment.

***Idiosoma sigillatum* (DBCA Priority 3)**

The SRE and conservation significant mygalomorph spider *Idiosoma sigillatum* prefers sandy soils, often associated with Banksia Woodland habitats on the western and central areas of the SCP (Rix et al. 2018) and based upon desktop assessments the species was originally considered to have a High likelihood of occurrence within vegetated areas of the PDE. The targeted survey reduced the likelihood of occurrence to Low except in up to 2.45 ha of habitat where it is Moderate Likelihood (Table 2).

If not managed appropriately, increasing sedimentation and alteration of surface hydrology has the potential to affect SRE fauna such as the mygalomorph spider *Idiosoma sigillatum* that live in burrows at ground level.

Mitigation of direct impacts

The impacts from vegetation clearing can be minimised through clearly marked boundaries for clearing during construction, fencing of remnant native vegetation during construction and operation to avoid unnecessary trampling by machinery, vehicles or people and the education/induction of personnel across all phases of the operation to avoid damage to adjacent vegetation.

Habitat for the SRE and conservation significant invertebrate appears to extend laterally into adjacent intact vegetation, based upon aerial imagery and observation during the targeted survey (Invertebrate Solutions 2026a, b). Larger tracts of remnant vegetation provide superior habitat for SRE and conservation significant invertebrates, compared to narrow strips of native vegetation, such as present within the PDE, that are subject to edge effects such as weed incursions. The narrow fringing habitats that are within the PDE are of generally lower quality compared with adjacent larger tracts of native vegetation and therefore have lower ecological value for species

Legend

- Project Development Envelope

SRE and Conservation Significant Habitat

- *Hylaeus globuliferus* Only
- *Hylaeus globuliferus / Antichiropus whistleri* Only
- All Five Key Species *(Hesperocolletes douglasi; Hylaeus globuliferus; Leioproctus contrarius; Antichiropus whistler; Idiosoma sigillatum)*

0 125 250 500 m

Scale: 1:15,000 @ A4

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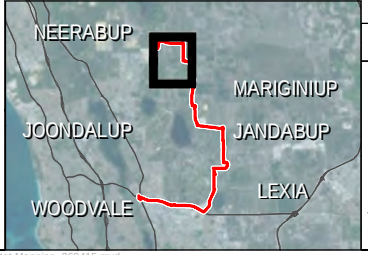
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY MAP



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GDA2020 MGA Zone 50	15/04/2026

PROJECT
NBT-WGA 132kv Line

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ENVIRONMAPS	TM	TM	0

Western Power

Figure 2a

SRE and Conservation Significant Invertebrate Habitat Mapping

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Legend

- Project Development Envelope

SRE and Conservation Significant Habitat

- *Hylaeus globuliferus* Only
- *Hylaeus globuliferus / Antichiropus whistleri* Only
- All Five Key Species *(Hesperocolletes douglasi; Hylaeus globuliferus; Leioproctus contrarius; Antichiropus whistler; Idiosoma sigillatum)*

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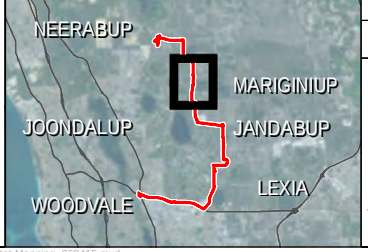

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ENVIRONMAPS	TM	TM	0

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Figure 2b

SRE and Conservation Significant Invertebrate Habitat Mapping

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Legend

- Project Development Envelope

SRE and Conservation Significant Habitat

- *Hylaeus globuliferus* Only
- *Hylaeus globuliferus / Antichiropus whistleri* Only
- All Five Key Species *(Hesperocolletes douglasi; Hylaeus globuliferus; Leioproctus contrarius; Antichiropus whistler; Idiosoma sigillatum)*

0 125 250 500 m

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LOCALITY MAP

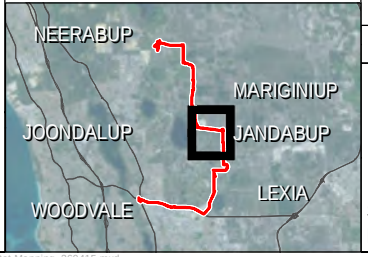

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Figure 2c

SRE and Conservation Significant Invertebrate Habitat Mapping

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Legend

- Project Development Envelope

SRE and Conservation Significant Habitat

- *Hylaeus globuliferus* Only
- *Hylaeus globuliferus / Antichiropus whistleri* Only
- All Five Key Species *(Hesperocolletes douglasi; Hylaeus globuliferus; Leioproctus contrarius; Antichiropus whistler; Idiosoma sigillatum)*

0 125 250 500 m

Scale: 1:15,000 @ A4

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LOCALITY MAP

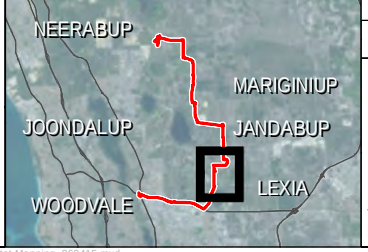

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Figure 2d

SRE and Conservation Significant Invertebrate Habitat Mapping

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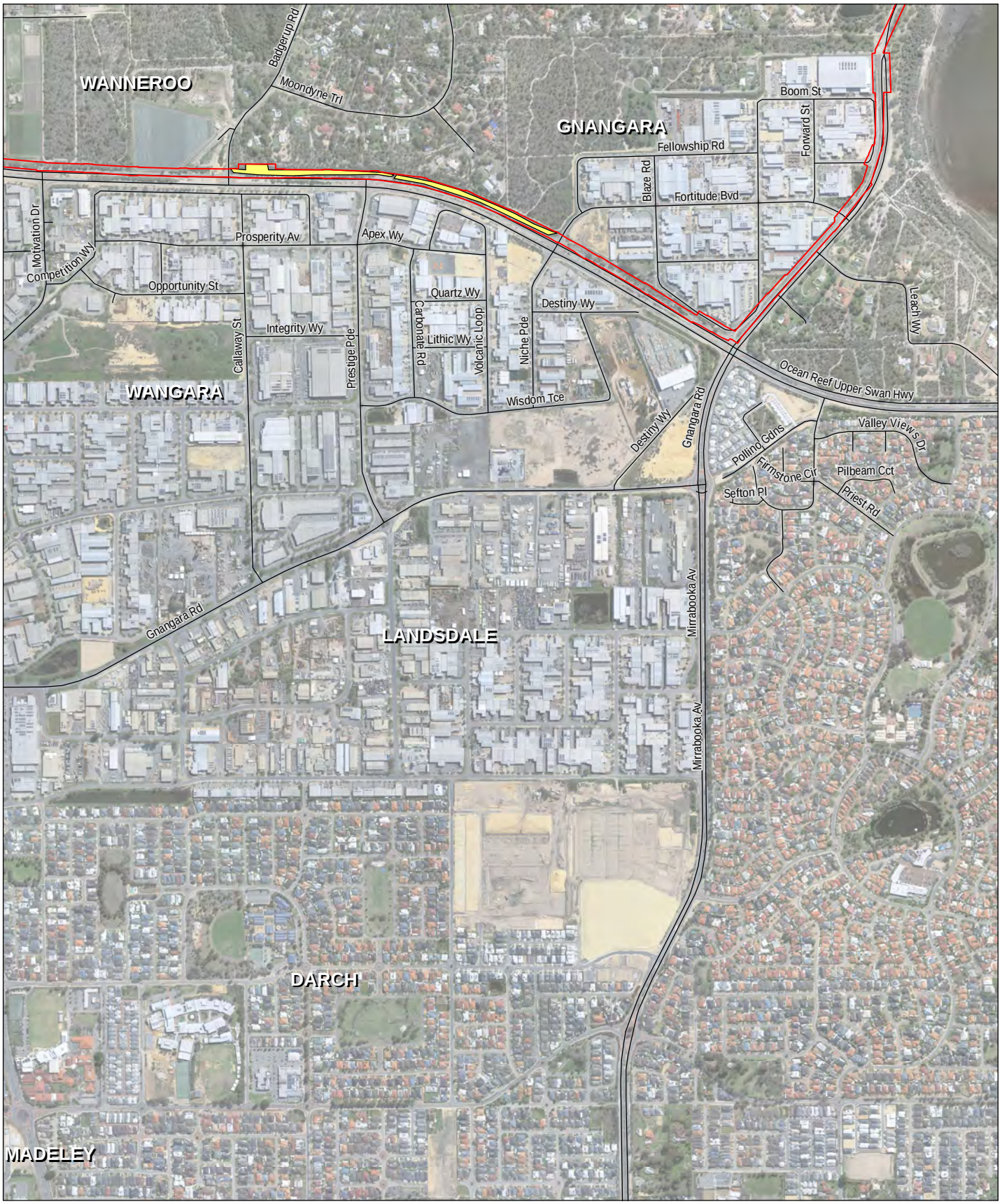

Legend

Project Development Envelope

SRE and Conservation Significant Habitat

Hylaeus globuliferus Only

Hylaeus globuliferus / Antichiropus whistleri Only

All Five Key Species *(Hesperocolletes douglasi; Hylaeus globuliferus; Leioproctus contrarius; Antichiropus whistler; Idiosoma sigillatum)*

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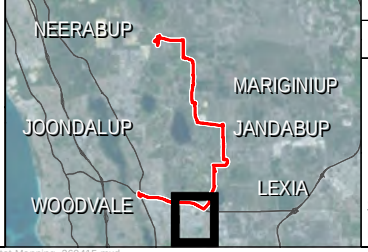

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ENVIRONMAPS	TM	TM	0

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Figure 2e

SRE and Conservation Significant Invertebrate Habitat Mapping

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Legend

- Project Development Envelope

SRE and Conservation Significant Habitat

- *Hylaeus globuliferus* Only
- *Hylaeus globuliferus / Antichiropus whistleri* Only
- All Five Key Species *(Hesperocolletes douglasi; Hylaeus globuliferus; Leioproctus contrarius; Antichiropus whistler; Idiosoma sigillatum)*

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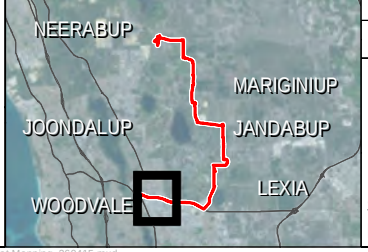

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Figure 2f

SRE and Conservation Significant Invertebrate Habitat Mapping

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Indirect impacts

The indirect impact of the clearing of native vegetation causing fragmentation of the remaining vegetation may lead to the restriction of genetic flow for SRE and conservation significant invertebrate species that have limited dispersal capabilities (Table 3). This indirect impact is considered to be the Low from the Project. Habitat fragmentation has a much greater potential to impact upon SRE and conservation significant invertebrate species due to their inherent lack of dispersal capability that allows other more mobile species to move between remnant vegetation patches. This impact is minimal with no High value SRE and conservation significant invertebrate habitat present within the PDE and no conservation significant invertebrate species with a High likelihood of occurrence within the PDE (Invertebrate Solutions 2026b).

Increased weed incursion into native bushland can have a significant impact upon SRE and conservation significant invertebrate species that rely on sometimes small microhabitats within the landscape. Due to the degree of historical disturbance along cleared tracks and paths in the area this is considered to be a Low impact, however, site wide weed control and vehicle/machinery hygiene requirements can limit this potential impact.

If not managed appropriately, increasing sedimentation and alteration of surface hydrology has the potential to affect SRE and conservation significant invertebrate fauna such as mygalomorph (spiders that live in burrows at ground level). Sedimentation can be managed by appropriate stormwater runoff design and during construction via management and mitigation measures.

Contamination of surface and groundwater during construction and operations may also have an impact upon SRE and conservation significant invertebrate habitat, but risks of contamination can be minimised by employing management and applying mitigation measures to minimise and prevent contamination. The potential for contamination during construction is limited to isolated areas of chemical storage and small quantities of hydrocarbons where machinery or generators are working. The risk of contamination during operation is minimal. Where management measures are implemented, the risk of hydrocarbon contamination to SRE and conservation significant invertebrate species and habitat is anticipated to be Low.

Vibration and noise from the construction and ongoing operation of the mine is expected to be minimal, especially beyond the construction period. These impacts are considered to be Very Low.

Mitigation of indirect impacts

Overall, approximately only 4.67 ha of potential invertebrate habitat of the PDE is proposed to be cleared or disturbed within the 37.71 ha PDE. There is limited capacity to move the position of towers, however, they have been arranged to avoid clearing in the most sensitive habitats, such as Banksia Woodland TECs. Whilst some potential habitat for conservation significant invertebrates will be directly impacted, the areas are not considered to be core habitat and are feeding and or transit areas for such species rather than breeding habitats. All of these areas are degraded to an extent and better invertebrate habitat is known to occur in adjacent native vegetated areas, often with conservation estate.

Table 3 Potential direct and indirect impacts to SRE and conservation significant invertebrates.

Impacts	Species specific impacts	Area of habitat impacted / Potential of Impact to SRE or Conservation Significant Fauna locally	Potential of Impact to SRE/ Conservation Significant Fauna Regionally (SCP)	Mitigation/Management
Potential Direct Impacts				
Vegetation clearing directly removing and/or disturbing SRE habitat	*Hesperocolletes douglasi*	**2.45 ha / Low**	**Low**	• **Minimise clearing as far as possible Clearly marked clearing boundaries;** • **fencing remnant vegetation;** • **education/induction of personnel** • **Span high value habitat areas**
	Hylaeus globuliferus	**4.67 ha / Low**	**Low**	
	Leioproctus contrarius	**2.45 ha / Low**	**Low**	
	Antichiropus whistleri	**2.93 ha / Low**	**Low**	
	Idiosoma sigillatum	**2.45 ha / Low**	**Low**	
Alteration of surface hydrology during powerline construction and operation	All taxa	**Very Low**	**Very Low**	• **management of surface runoff to avoid sedimentation on native vegetation**
	Idiosoma sigillatum	**Low**	**Low**	
Potential Indirect Impacts				
Habitat fragmentation and genetic isolation due to vegetation clearing	*Hesperocolletes douglasi*	**2.45 ha / Very Low**	**Very Low**	• **Not anticipated to increase from current fragmentation.** • **Allow low height undergrowth of native species in powerline corridor**
	Hylaeus globuliferus	**4.67 ha / Very Low**	**Very Low**	
	Leioproctus contrarius	**2.45 ha / Very Low**	**Very Low**	
	Antichiropus whistleri	**2.93 ha / Low**	**Low**	
	Idiosoma sigillatum	**2.45 ha / Low**	**Low**	
Weed incursion during powerline construction and operation	All taxa	**Low**	**Low**	• **Standard weed control** • **Weed and seed inspections of plant and equipment**
Hydrocarbon spills during construction and/or operations	All taxa	**Low**	**Low**	• **All hydrocarbon storage to be fully or self bunded** • **Any hydrocarbon spills to be reported and remediated**
Vibration disturbance from construction activities	All taxa	**Very Low**	**Very Low**	
Noise during construction works	All taxa	**Very Low**	**Very Low**	
Noise during operations	All taxa	**Very Low**	**Very Low**	

Conclusion

Overall, approximately 4.67 ha of potential invertebrate habitat of the PDE is proposed to be cleared or disturbed within the 37.71 ha PDE. There is limited capacity to move the position of towers, however, they have been arranged to avoid clearing in the most sensitive habitats, such as Banksia Woodland TECs. Whilst some potential habitat for conservation significant invertebrates will be directly impacted, the areas are not considered to be core habitat and are feeding and or transit areas for such species rather than breeding habitats. All of these areas are degraded to an extent and better invertebrate habitat is known to occur in adjacent native vegetated areas, often with conservation estate.

Regional significance and cumulative impacts

At a regional scale on the Swan Coastal Plain region, the direct and indirect impacts are generally considered to be low due to the small narrow nature of the linear infrastructure, and given similar or better habitat values are present in surrounding vegetation. Habitat fragmentation is the impact, either direct or indirect, that is considered to potentially be the most significant at a regional scale and this impact is still considered to be Low as the corridor is largely cleared land and minimal additional clearing will be undertaken. Other anticipated impacts including altering local hydrology and weed incursion are considered to be extremely small in the scale of the region and existing historical disturbance from urbanisation.

Cumulative impacts will be low. The primary cumulative impact from project development is land clearance, however, due to the degree of small project size, the choice of existing cleared land for the corridor this is considered to be Low. It is anticipated that the Project will not add significantly to the cumulative impacts to SRE or conservation significant fauna in the local area, especially since none of the habitats identified would provide habitat isolates that would be likely to contain SRE taxa within the limited extent of the PDE. All the vegetation units are laterally continuous within the region and not limited to the PDE.

Sincerely

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Limitations and Exclusions

This study was limited to the extent of information made available to Invertebrate Solutions at the time of undertaking the work. Information not made available to this study, or which subsequently becomes available may alter the conclusions made herein.

The opinions, conclusions and any recommendations in this report are based on information reviewed at the date of preparation of the report. Invertebrate Solutions has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. The opinions, conclusions and any recommendations in this report are based on assumptions made by Invertebrate Solutions described in this report (this section and throughout this report). Invertebrate Solutions disclaims liability arising from any of the assumptions being incorrect.

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