

Significance Criteria	Comment
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	The Proposed Action is unlikely to result in the establishment of harmful invasive species. Horse Swamp comprises <i>Melaleuca raphiophylla</i> over introduced pasture herbs and grasses. The wetland is already considered degraded. The Proposed Action will not result in further degradation of this wetland.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The Proposed Action is unlikely to disrupt the lifecycle of the Glossy Ibis. The Proposed Action is not within Glossy Ibis breeding habitat.

### 12.11.3. Conclusion

The Proposed Action is considered unlikely to have a significant impact on the Glossy Ibis.

### 12.12. Potential impacts to MNES

The potential impacts on MNES are described in Table 99.

**Table 99: Potential impacts on MNES**

Proposed Action Stage	Impact Type	Activities	Potential Impacts
Construction	Direct	Clearing of native vegetation.	Permanent loss of: <ul style="list-style-type: none"> <li>• 10.05 ha of Banksia Woodland of the Swan Coastal Plain TEC.</li> <li>• 81.4 ha of Carnaby's Black Cockatoo foraging habitat including 54.1 ha quality habitat.</li> <li>• 68.1 ha of Forest Red-tailed Black Cockatoo foraging habitat including 38.0 ha of quality habitat.</li> <li>• 81.4 ha of Baudin's Black Cockatoo foraging habitat including 42.8 ha of quality habitat.</li> <li>• Removal of 423 Black Cockatoo potential breeding trees including 33 trees with hollows, none of which were assessed as suitable for Black Cockatoo nesting.</li> <li>• Injury/mortality of Black Cockatoos from vehicle strike.</li> <li>• Inadvertent removal of trees with nesting occurring.</li> </ul>

Proposed Action Stage	Impact Type	Activities	Potential Impacts
	Indirect	<ul style="list-style-type: none"> <li>• Accidental clearing of native vegetation.</li> <li>• Cut and fill works.</li> <li>• Soil compaction.</li> <li>• Construction of permanent and temporary infrastructure including but not limited to rail, roads, car parks, buildings, hard stand and laydown areas.</li> <li>• Temporary groundwater abstraction for construction water supply and temporary dewatering for construction purposes.</li> <li>• Disturbance to Bennett Brook riverbed leading to increase sediment loads migrating downstream.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction and spread of declared pests and other weed species.</li> <li>• Introduction and spread of Phytophthora dieback.</li> <li>• Decline in Banksia Woodland TEC as a result of groundwater drawdown.</li> <li>• Degradation of Carter's Freshwater Mussel/potential Black-stripe Minnow habitat from contamination of surface water, increased sediment loads, altered surface hydrology and dewatering.</li> <li>• Disruption or disturbance to fauna as a result of noise, vibration, light and dust.</li> </ul>
Operation	Indirect	<ul style="list-style-type: none"> <li>• Operation and maintenance of the railway line</li> <li>• Operation of plant and machinery and service vehicles.</li> <li>• Operation and maintenance of the electrified railway line.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction and spread of declared pests and other weed species.</li> <li>• Introduction and spread of dieback.</li> <li>• Injury/mortality of Black Cockatoos from train strike.</li> </ul>

## 12.13. Mitigation of impacts to MNES

Table 100 demonstrates how the PTA has applied the mitigation hierarchy of avoid, minimise and rehabilitate during design of the Proposed Action to address key potential impact to MNES.

**Table 100: Summary of environmental impacts and mitigation hierarchy for Matters of National Environmental Significance**

Potential impacts	Assessment of impacts	Preliminary Mitigation Hierarchy
<b>Direct Impacts</b>		
Removal of up to 12.3 ha of inferred suitable <i>Caladenia huegelii</i> habitat.	<p>Targeted surveys of habitat identified as potentially critical to the survival of <i>Caladenia huegelii</i> over two consecutive years have not encountered any individuals or populations of the species. Two areas of Suitable Habitat have been identified within the Development Envelope, which are synonymous with the Banksia Woodlands TEC. An assessment against critical habitat criteria has determined that neither Area A nor Area D can be considered critical to the survival of the species.</p> <p>The Proposed Action is therefore not considered to have a significant impact on <i>Caladenia huegelii</i> habitat.</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>A significant portion (6.95 ha) of <i>Caladenia huegelii</i> habitat Area A, represented by vegetation in Excellent condition, has been incorporated into a NVRA.</li> <li>Permanent access paths where the rail alignment crosses the junction between Drumpellier Drive and Gngara Road have been relocated to avoid impact on <i>Caladenia huegelii</i> habitat Area D.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>The potential habitat coincides with TEC Patch 1 and TEC Patch 5 of the Banksia Woodlands TEC. Measures aimed at minimising impacts to <i>Caladenia huegelii</i> are consistent with those implemented for minimising impacts on this TEC. These are outlined in Section 5.7 and will be implemented in accordance with the TECMP.</li> <li>The embankment and proposed alignment have been modified to minimise impacts to <i>Caladenia huegelii</i> habitat Area D.</li> <li>The location of the dive structure under the southbound carriageway of Tonkin Highway was modified to allow the rail to cross <i>Caladenia huegelii</i> habitat Area A through the lowest condition vegetation practicable.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul>
Removal of quality Black Cockatoo foraging habitat	Field surveys identified 51.4 ha of Carnaby's quality foraging habitat (habitat classed as medium or high quality) within the Proposed Action's Footprint and within this area 38 ha Forest Red-tailed Black Cockatoo and 42.8 ha Baudin's quality foraging habitat.	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>The Development Envelope has been aligned to avoid areas of quality foraging habitat wherever practicable.</li> <li>NVRAs have been established that specifically incorporate potential Black Cockatoo habitat.</li> </ul>

Potential impacts	Assessment of impacts	Preliminary Mitigation Hierarchy
		<p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>Where unavoidable, the alignment has been designed to minimise impacts on Black Cockatoo habitat.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>Not Applicable</li> </ul>
Removal of 423 potential breeding trees for Carnaby's and Forest Red-tailed Black Cockatoos.	<p>Of the 423 potential nesting trees (trees with DBH &gt; 500mm), 33 were noted to contain hollows. An inspection of hollows determined that none are considered suitable for nesting purposes. No actual nesting or sign of nesting has been observed.</p> <p>Field surveys identified 30.8 ha of potential suitable roosting habitat within the Development Envelope, however no roosting was observed. There are no historical records of roosting occurring within the Development Envelope</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>The Development Envelope has been aligned to avoid potential breeding trees wherever practicable.</li> <li>NVRAs have been established that specifically incorporate Black Cockatoo breeding trees.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>Where unavoidable, the alignment has been designed to minimise impacts on Black Cockatoo breeding trees.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>Not Applicable</li> </ul>
Injury/mortality of Black Cockatoos from vehicle and/or train strike	<p>Injury of Black Cockatoos may occur as a result of vehicle movement during construction activities or train passage during operation.</p> <p>Black cockatoos are known to drop to the ground when they alight from a foraging location, and this increases the risk of vehicle strike when alighting from roosts adjacent to transport corridors.</p> <p>Habitat that attracts black cockatoos to forage adjacent to transport corridors increases the risk of vehicle impact resulting in mortality and injury.</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>The Proposed Action includes high fencing to deter Black Cockatoos from entering the rail corridor.</li> <li>No Black Cockatoo foraging species will be planted near the train corridor for landscaping to deter use of these areas by Black Cockatoos.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul>
Removal of up to 10.05 ha of Banksia Woodlands of the Swan Coastal Plain listed as a TEC under EPBC Act and Priority 3 by DBCA.	<p>Two TEC patches will be impacted by the Proposed Action. The Proposed Action will result in the clearing of 8.54 ha of vegetation from Patch 2 Malaga TEC, comprising 7.26 ha in Very Good condition and 0.84 ha in Good condition. The Proposed Action will result in the clearing of up to 1.51 ha of vegetation from Patch 5 Gngangara Road all of which is in Good – Very Good condition. The alignment dissects Patch 1, resulting in increased edge effects and creating two smaller patches.</p> <p>An assessment against the significant impact guidelines indicates that the impacts of the Proposed Action on Banksia Woodland TEC are likely to be considered significant.</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>The Proposed Action has been designed to avoid three patches of TEC that were mapped within the survey area.</li> <li>A significant portion (6.22 ha) of vegetation in Excellent condition within Patch 1 has been incorporated into a NVRA.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>Permanent access paths where the rail alignment crosses the junction between Drumpellier Drive and Gngangara Road have been relocated to minimise the impact on TEC Patch 5.</li> </ul>

Potential impacts	Assessment of impacts	Preliminary Mitigation Hierarchy
		<ul style="list-style-type: none"> <li>The embankment and proposed alignment have been modified to minimise impacts to TEC Patch 5.</li> <li>The location of the dive structure under the southbound carriageway of Tonkin Highway was modified to allow the rail to cross Patch 1 through the lowest condition vegetation practicable.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul>
Indirect Impacts – Construction Phase		
Edge effects	<p>Vegetation condition has the potential to decline adjacent to the alignment where it traverses previously uncleared areas. This is most relevant where the alignment passes through Patch 1 Malaga TEC and <i>Caladenia huegelii</i> habitat.</p> <p>With the implementation of appropriate weed and dieback management, particularly within Patch 1 Malaga TEC, and restriction of access once construction has been completed, this impact is not considered to be significant.</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>The majority of the alignment has been designed to avoid dissecting areas of native vegetation, thus limiting edge effects to one side of the development.</li> <li>Mitigation measures outlined in Section 5.7 of this ERD have been developed to minimise edge effects as a result of the Proposed Action. These have been incorporated into the TECMP and CEMP.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul>
Introduction/ spread of dieback as a result of contaminated machinery, equipment and vehicles, movement of dieback infested soil into dieback free areas and imported construction materials containing dieback	<p>A dieback survey undertaken by Glevan (2020) determined that Patch 1 Malaga TEC was largely infested by dieback, apart from two areas situated either side of the rail alignment.</p> <p>The remainder of the Development Envelope was mapped as either Excluded, Uninterpretable-Unprotectable or Infested.</p> <p>No dieback mapping has been undertaken for Patch 5 Gnangara Road TEC or any other areas adjacent to the Development Envelope.</p> <p>Dieback has the potential to significantly impact the quality of the Banksia Woodland TEC and <i>Caladenia huegelii</i> habitat adjacent to the Development Envelope.</p> <p>Foraging, roosting and potent nesting habitat for Black Cockatoo species is susceptible to impacts from dieback.</p> <p>Inappropriate construction management practices have the potential to spread the dieback infestation into the dieback free area or other areas throughout the</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>Mitigation measures outlined in Section 5.7 of this ERD provide direction on appropriate measures for minimising the risk of introducing dieback infestations to the site, including clean in procedures.</li> <li>The TECMP includes procedures to prevent the movement of dieback infested soil from to uninfested areas within the Patch 1 Malaga TEC.</li> <li>Mitigation measures outlined in Section 5.7 of this ERD include appropriate procedures for management of topsoil and mulch from cleared areas, such that dieback infested material is not later re-used in un-infested areas.</li> </ul>

Potential impacts	Assessment of impacts	Preliminary Mitigation Hierarchy
	Development Envelope and adjacent areas.	<u>Rehabilitate</u> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul>
Introduction/ spread of weeds by way of natural spread from cleared areas, imported on machinery, vehicles and equipment, or in imported materials.	<p>No Weeds of National Significance were identified during field surveys.</p> <p>Two declared species listed under Section 22(2) of the BAM Act, <i>Zantedeschia aethiopica</i> (Arum Lily) and <i>Moraea flaccida</i> (Cape Tulip), were recorded during field surveys.</p> <p>An infestation of the highly invasive exotic grass species <i>*Cenchrus macrourus</i> (African feather grass) was recorded in the Bennett Brook wetland vegetation.</p> <p>Weeds have the potential to have a significant impact on habitat quality and as such, have the potential to indirectly impact the Banksia Woodlands TEC and <i>Caladenia huegelii</i> habitat. <i>*Cenchrus macrourus</i> has the potential to indirectly impact Carter's Freshwater Mussel habitat within Bennett Brook.</p> <p>Inappropriate construction management practices have the potential to spread weed infestation throughout the Development Envelope and adjacent areas.</p>	<u>Avoid</u> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul> <u>Minimise</u> <ul style="list-style-type: none"> <li>Mitigation measures outlined in Section 5.7 of this ERD include direction on appropriate measures for minimising the risk of spreading weeds, including weed/seed inspections, and brush down procedures.</li> <li>Mitigation measures outlined in Section 5.7 of this ERD includes measures to manage topsoil management measures to reduce the weed seed bank prior to re-use for rehabilitation or landscaping purposes.</li> <li>The TECMP outlines procedures to prevent the movement of weed infested soil from within the Patch 1 Malaga TEC to other areas of the Development Envelope.</li> </ul> <u>Rehabilitate</u> <ul style="list-style-type: none"> <li>Not Applicable.</li> </ul>
Groundwater drawdown from dewatering and abstraction	<p>Construction of the Proposed Action will require periods of groundwater abstraction and dewatering to occur. Abstraction will be required to source a construction water supply, and dewatering will occur where the groundwater levels need to be reduced in order to facilitate excavations for construction purposes.</p> <p>There is the potential for unmanaged groundwater drawdown to impact the Banksia Woodlands TEC and <i>Caladenia huegelii</i> habitat adjacent to the Proposed Action.</p> <p>Due to the importance of the TECs to State and Commonwealth conservation objectives, this indirect impact has the potential to be significant.</p> <p>Dewatering also has the potential to impact wetlands, and therefore potentially impact the Carter's Freshwater Mussel and Black-stripe Minnow.</p>	<u>Avoid</u> <ul style="list-style-type: none"> <li>Groundwater abstraction and drawdown will be managed in such a way as to avoid impacts on Banksia Woodlands TEC or other GDEs outside the Development Envelope.</li> <li>Groundwater drawdown and abstraction will be managed to ensure impacts to known habitats supporting the Carter's Freshwater Mussel and Black-stripe Minnow are minimised wherever practicable.</li> </ul> <u>Minimise</u> <ul style="list-style-type: none"> <li>Where groundwater drawdown impacts are determined to be unavoidable, management measures will be implemented that are aimed at minimising the depth and duration of drawdown at wetlands and permanent pools outside the Development Envelope.</li> <li>Mitigation measures outlined in Section 5.7 of this ERD and the TECMP outline management</li> </ul>

Potential impacts	Assessment of impacts	Preliminary Mitigation Hierarchy
		<p>measures to minimise potential impacts on the Patch 1 Malaga TEC.</p> <ul style="list-style-type: none"> <li>• Groundwater abstraction and drawdown will be managed in such a way as to avoid any indirect impacts on Mussel Pool.</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>• Not Applicable.</li> </ul>
<p>Sedimentation and water quality for bridge construction at Bennett Brook</p>	<p>There is potential for construction of the bridge at Bennett Brook to impact on habitat of Carter's Mussel and Black-stripe Minnow.</p> <p>Neither species is considered likely to occur within the Footprint, however indirect impacts associated with increased sediment loads has the potential to impact populations downstream from the Proposed Action.</p>	<p><u>Avoid</u></p> <ul style="list-style-type: none"> <li>• Bridge construction avoids installation of permanent structures in the water way, ensuring stream flow will be maintained.</li> </ul> <p><u>Minimise</u></p> <ul style="list-style-type: none"> <li>• Mitigation measures outlined in Section 8.7 of this ERD include measures to manage surface water runoff from disturbed areas during construction and minimise impacts of turbidity and sedimentation impacts down stream</li> </ul> <p><u>Rehabilitate</u></p> <ul style="list-style-type: none"> <li>• Not Applicable.</li> </ul>



## 13. Holistic impact assessment

It is important to recognise that the Proposal will not affect relevant environmental factors in isolation, and that there are many connections and interactions between parts of the environment (environmental factors). This section of the ERD considers the connections and interactions between the preliminary key environmental factors relevant to the Proposal:

- Flora and vegetation.
- Terrestrial fauna.
- Terrestrial environmental quality.
- Inland waters.
- Social surroundings.

Each of these environmental factors is addressed separately in Sections 5 to 10. Table 101 provides a summary of the assessment of environmental factors and how these connect to the EPA's environmental principles/objectives, after application of the EPA's environmental mitigation hierarchy (avoid, minimise, rehabilitate). A summary of how the Proposal addresses the principles outlined in the EP Act is provided in Table 10. Other environmental factors are considered in Section 10.

The PTA acknowledges the connections and interactions between environmental factors and that those relationships may require consideration and management to achieve good overall environmental outcomes. A key focus of design development of the Proposal to date has been the identification of relevant environmental factors, and early integration of these environmental factors into the design development process. This has allowed a holistic view of environmental factors to be taken and responded to through design to avoid or minimise impacts on those environmental factors while still achieving Proposal objectives and good design outcomes for future users of the Proposal.

Table 101 summarises key connections and interactions between environmental factors (grouped by the relevant EPA theme) and the series of measures that are anticipated to be the most significant in the mitigation and management of impacts across environmental factors. Of these, three have been identified as representing the most important impacts of the Proposal when assessed holistically:

- Impacts within and around Bennett Brook and its tributaries, with a series of impact interactions relating to surface water flows and quality, interactions with groundwater and groundwater dependent ecosystems, terrestrial and aquatic habitat connectivity, and urban amenity, cultural and natural heritage.
- Vegetation clearing and loss of habitat, particularly foraging habitat for Black Cockatoo species (Carnaby's Cockatoo and Forest Red-tailed Cockatoo), with associated changes in ecological and hydrological systems.
- Reduction in extent of part of Whiteman Park, with implications for urban amenity, cultural and natural heritage, fauna habitat and connectivity.



Impacts to environmental factors and the connections and interactions between them have been subject to concerted efforts at avoidance and minimisation, with residual impacts expected to be unavoidable. Notwithstanding, the PTA will investigate and where practicable, apply additional measures to avoid or minimise impacts during the future detailed design process for the Proposal. This will include the following key focus areas:

- At Bennett Brook, opportunities to:
  - Minimise changes to surface water and ground water flows;
  - Enhance habitat connectivity through fauna crossing infrastructure, revegetation of disturbed areas and landscaping of the Proposal using appropriate locally endemic native species, minimise intrusion of lighting and noise sources, and minimise interfaces between the public / traffic and fauna; and
  - Limit the potential for runoff, accidental leaks and spills, waste and other potential discharges from Proposal to affect surrounding natural, rehabilitated and landscaped areas of ecological value.
- With respect to clearing of native vegetation, opportunities to:
  - Further minimise the Proposal's construction and operational footprints where practicable;
  - Implement offsets for areas of ecological value that cannot be avoided, consistent with the Offsets Strategy (PTA 2020); and
  - Rehabilitate disturbed areas and undertake landscaping of the Proposal using appropriate locally endemic native species.
- At Whiteman Park, opportunities to:
  - Further minimise the need to directly affect Whiteman Park and access arrangements for park; and
  - Enhance social, cultural and natural heritage values, particularly through opportunities that may be identified during consultation with affected stakeholders.

The PTA has provided a comprehensive assessment of the Proposal's potential impacts to the EPA's key environmental factors. The PTA has considered the regional context of all factors including the extent, condition and values of factors such as flora and vegetation, fauna and inland waters and the interconnections between each factor across the Swan Coastal Plain.

This ERD identified potential impacts that could either directly or indirectly impact these factors, assessed those impacts and determined that whilst the majority of these impacts can be avoided, managed or mitigated there are some significant residual impacts that will be offset in the proposed PTA Offsets Strategy

The PTA is confident that with the implementation of the proposed mitigation and management measures, outlined in the CEMP (Appendix U), TECMP (Appendix X), Dewatering Management Plan, Acid Sulfate Soil Management Strategy (Appendix W) and the commitment to offset the significant residual impacts in the proposed Offset Strategy (Appendix T), the Proposal will meet the EPA's objectives for all of the key environmental factors.

**Table 101: Key Linkages between environmental factors**

Environmental Factor	Significant residual impacts	Predicted outcomes	Connection to environmental principles / environmental objectives
<p>Flora and vegetation</p>	<ul style="list-style-type: none"> <li>• 17.2 ha of direct loss of regionally significant bushland within Bush Forever site 304.</li> <li>• 10.05 ha of direct loss of Banksia Woodlands the Swan Coastal Plain TEC (including Banksia Woodlands PEC) listed as Endangered under the EPBC Act and Priority 3 by DBCA.</li> </ul> <p>PTA has proposed an Offsets Strategy to counterbalance the significant residual impacts for the Proposal</p>	<p>Given the optimisation of the Footprint to avoid impacts to the Banksia Woodlands TEC, the minimisation of impacts to utilise existing disturbed areas and implementation of a CEMP and TECMP, combined with implementation of an Offset Strategy for the Proposal, the PTA is confident that the Proposal will be able to meet the EPA's objective for Flora and vegetation.</p>	<p>The PTA has applied the <b>Precautionary Principle</b> to ensure that, wherever practicable, the Proposal has avoided clearing. The PTA has reduced the size of the Proposal's Development Envelope by 36.5 ha since referral of the Proposal to the EPA.</p> <p>A Proposal footprint of 249 ha has been applied to the Proposal to minimise the potential impacts to environmental values within the 463.8 ha Development Envelope. Of the proposed clearing of 152.1 ha of native vegetation within the Footprint, 92.1 ha (60%) is classified as Completely Degraded and only 0.4 ha is in Excellent condition. The majority of the Footprint (189.1 ha or 76%) has been designed to be located within previously cleared or Completely Degraded condition vegetation. The PTA has aligned the Footprint along existing road infrastructure at Drumpellier Drive to further minimise the impacts on Bush Forever site 304 and Whiteman Park PRR.</p> <p>The <b>Principle of the Conservation of Biological Diversity</b> is demonstrated by the PTA's efforts in minimising the impacts on integral components of ecosystems by limiting impacts on regionally significant bushland to 17.2 ha within Bush Forever site 304 and limiting clearing of the Banksia Woodlands TEC to 10.05 ha. This is equivalent to 0.02% of the extent of Banksia Woodlands TEC that is protected in conservation reserves across its extent. The impact of 10.05 ha to Banksia Woodlands TEC (including PEC) and 17.2 ha of regionally significant bushland within Bush Forever site 304.</p> <p>Through minimising the size of the Development Envelope to the north of Malaga Station and the application of a NVRA to the south of the Malaga Station, the PTA has avoided clearing of 14.96 ha of Banksia Woodlands TEC and PEC.</p> <p>The PTA has reduced the Proposal's impact on Bush Forever site 304 by 17 ha since referral, by reducing the size of the Development Envelope and further limiting disturbance through the application of a Proposal Footprint.</p>

Environmental Factor	Significant residual impacts	Predicted outcomes	Connection to environmental principles / environmental objectives
			<p>The Proposal minimises the impacts to Bennett Brook UFI 15259 to a direct loss of 0.9 ha by limiting the width of the Development Envelope. The Proposal has been designed to construct a rail bridge over Bennett Brook to ensure that the regional ecological linkage Greenways 13 through Bennett Brook maintains connectivity and function post implementation of the Proposal.</p> <p>The Proposal further protects native vegetation through the inclusion of 44.9 ha of Native Vegetation Retention Areas within the Development Envelope. NVRAs have been selected to protect values associated with flora and vegetation, fauna habitat and wetlands.</p> <p>PTA has undertaken modelling of the potential drawdown impacts to environmental values within the Proposal, to minimise the potential for indirect impacts associated with dewatering for construction purposes. This modelling demonstrated that the dewatering for the Tonkin Highway dive structure and the Gnangara Road bridge, which are adjacent to Patch 1 and Patch 5 Banksia Woodlands TEC can be managed to avoid any significant impacts, and the PTA will implement a TECMP that includes appropriate triggers and contingencies to manage the potential indirect impacts.</p> <p>In summary, the PTA's mitigation strategy, the Proposal design and the implementation of the Offsets Strategy has ensured that the Proposal demonstrates adherence to the <b>Principle of Intergenerational Equity</b> by ensuring that the health, diversity and productivity of the environment is enhanced for future generations.</p>
Terrestrial fauna	<ul style="list-style-type: none"> <li>Loss of 81.4 ha of foraging habitat for Carnaby's and Baudin's Black Cockatoo.</li> <li>Loss of 68.1 ha of foraging habitat for Forest Red-tailed Black Cockatoo.</li> </ul>	The selection of the rail alignment through areas of highly disturbed fauna habitat or adjacent to existing roads together with the application of the management strategies outlined in the CEMP and the TECMP, and the implementation of an Offsets Strategy for the	<p>PTA has applied the <b>Precautionary Principle</b> to terrestrial fauna through the careful selection of the preferred alignment to avoid the clearing of Black Cockatoo habitat wherever practicable.</p> <p>The PTA has reduced the size of the Proposal's Development Envelope by 36.5 ha since referral of the Proposal to the EPA, avoiding high value fauna habitat, including Black Cockatoo habitat, at the Malaga TEC and Whiteman Park Station. The reduction in the Development Envelope also increased the buffer between the Proposal and Horse Swamp wetland.</p> <p>The PTA has also minimised impacts to fauna habitat through the selection of a Development Envelope where approximately 416.6 ha (90%) of the</p>

Environmental Factor	Significant residual impacts	Predicted outcomes	Connection to environmental principles / environmental objectives
	<ul style="list-style-type: none"> <li>Loss of 423 potential nesting trees, including 33 with hollows.</li> </ul> <p>PTA has proposed an Offsets Strategy to counterbalance the significant residual impacts for the Proposal.</p>	<p>Proposal, the PTA is confident that the Proposal will meet the EPA's objective for Terrestrial fauna.</p>	<p>463.8 ha Development Enveloped consists of highly fragmented or degraded fauna habitat or cleared areas containing no fauna habitat value.</p> <p>A Footprint of 249 ha has been applied to the Proposal to restrict and minimise the potential impacts to fauna habitat within the Development Envelope. The PTA has aligned the Footprint through highly degraded fauna habitat in Marshall Paddocks and adjacent to existing road infrastructure along Drumpellier Drive to further minimise the impacts on fauna habitat. The Proposal requires clearing of 188.7 ha of general fauna habitat within the Footprint, of which 218.5 ha (88%) is of low to no general fauna habitat value.</p> <p>The <b>Principle of Conservation of Biological Diversity and Ecological Integrity</b> is demonstrated through consideration of the impact in a regional context. The loss of up to 81 ha of foraging habitat for Carnaby's and Baudin's Black Cockatoos and 68.1 ha for Forest Red-tailed Black Cockatoo represents no more than 0.7% of habitat for any species within a 10 km buffer of the Proposal.</p> <p>PTA's establishment of NVRAs further demonstrates its commitment to the principle by ensuring that stands of quality Black Cockatoo habitat are protected from construction activities and potential changes to Proposal design. The NVRAs protect approximately 20% of Black Cockatoo foraging habitat within the Development Envelope. NVRAs also protect 43.5 ha (12%) of fauna habitat within the Development Envelope.</p> <p>The Proposal aims to minimise impacts to ecological integrity by locating the Footprint adjacent to Drumpellier Drive, where barrier effects of the road and kangaroo fencing currently exist and aligning the rail next to this road avoids creating additional impediment to fauna movement. To minimise potential barrier effects of the rail, the Proposal includes a fauna crossing at Bennett Brook bridge and provision of an additional fauna crossing within Marshall Paddocks, to the east of the bridge. The construction of a rail bridge that spans Bennett Brook and avoids interfering with the watercourse will also maintain the connectivity and function of the ecological linkage through Bennett Brook. Clearing has also been limited at Bennett Brook and will be revegetated to reinstate fauna habitat and ecological values.</p>

Environmental Factor	Significant residual impacts	Predicted outcomes	Connection to environmental principles / environmental objectives
			<p>The PTA avoided and minimised impacts to wetlands through the design of the Proposal, the implementation of a Proposal Footprint and the application of NVRAs. Potential impacts to aquatic fauna habitat from the construction of the Proposal will be adequately managed through the CEMP.</p>
Terrestrial environmental quality	<p>No significant impacts to Terrestrial environmental quality are expected as a result of the Proposal.</p>	<p>With the application of an Acid Sulfate Soil Management Strategy, CEMP and unexpected finds protocol, PTA is confident that the Proposal will meet the objective for Terrestrial environmental quality.</p>	<p>The PTA is likely to encounter Acid Sulfate Soils (ASS) or Potential Acid Sulfate Soils (PASS) whilst constructing the Proposal. The PTA will accept the onus for treatment, remediation and if necessary, disposal of any residual ASS contaminated material and will accordingly apply the polluter pays principle (those who generate pollution and waste should bear the cost of contaminant avoidance or abatement). The PTA will therefore adhere to the <b><i>Principles in relation to Improved Valuation, Pricing and Incentive Mechanisms.</i></b></p> <p>In the unlikely eventuality that the PTA inadvertently encounters or disturbs any areas of contaminated soil or groundwater, The PTA will accept the same principle and treat, remediate and if necessary dispose of any residual contaminated soil or ground water attributable to its construction activities.</p> <p>As all reasonable and practicable measures will be taken to minimise the generation of waste, and ensure no discharge into the environment, PTA will also be adhering to the <b><i>Principle of Waste Minimisation.</i></b></p>
Inland waters	<ul style="list-style-type: none"> <li>• 0.1 ha of CCW UFI 8429</li> <li>• 1.2 ha of CCW UFI 8728.</li> <li>• 0.6 ha of CCW UFI 15259 (Bennett Brook).</li> <li>• 0.5 ha of REW UFI 8678.</li> </ul> <p>PTA has proposed an Offsets Strategy to counterbalance the significant residual impacts for the Proposal.</p>	<p>Application of management measures outlined in the CEMP.</p> <p>Having regard to the proposed mitigation measures, the implementation of the management measures outlined in the CEMP (Appendix U, TECMP (Appendix X) and Dewatering Plan, combined with the</p>	<p>The PTA avoided and minimised impacts to wetlands through the design of the Proposal, the implementation of a Proposal Footprint and the application of NVRAs. The Proposal has been designed to not impede water flows to minimise the risk of indirect impacts to wetland adjacent to the Development Envelope.</p> <p>The wetlands within the Footprint will be directly impacted by the Proposal through clearing for rail construction or could potentially be indirectly impacted by changes to hydrological processes and or reduction in water quality. For the implementation of the Proposal 1.9 ha of Conservation Category Wetlands UFI 8417, UFI 8429, UFI 8728 and UFI 15259 (Bennett Brook) will be cleared for the implementation of the Proposal.</p>

Environmental Factor	Significant residual impacts	Predicted outcomes	Connection to environmental principles / environmental objectives
		<p>implementation of an Offsets Strategy for the Proposal, the PTA is confident that the Proposal will meet the EPA's objective to protect inland waters.</p>	<p>The Proposal minimises the impacts to Bennett Brook UFI 15259 to a direct loss of 0.9 ha by limiting the width of the Development Envelope. The Proposal has been designed to construct a rail bridge over Bennett Brook to ensure that the regional ecological linkage Greenways 13 through Bennett Brook maintains connectivity and function post implementation of the Proposal.</p> <p>The Proposal intersects one REW of biological value as a dampland with Good vegetation condition, of which 0.5 ha of Good condition vegetation will be cleared for the Proposal.</p> <p>The Proposal has been designed to avoid impacts to UFI 8724 (Horse Swamp) which is a palusplain wetland more than 50 metres outside of the Development Envelope in the south-eastern corner of Whiteman Park within Bush Forever site 304 that has conservation and recreational values. The Proposal's Development Envelope was realigned to avoid impacts to Horse Swamp, and a NVRA has been applied to the edge of the Development Envelope to provide an additional precautionary buffer to prevent indirect impacts. The carpark design at Whiteman Park Station will be designed according to WSUD principles to ensure that surface water runoff is managed to prevent water quality impacts to Horse Swamp. No impacts to Horse Swamp are anticipated in the implementation of the Proposal.</p> <p>Groundwater and surface water impacts are considered manageable by the Proposal's CEMP, TECMP and a Dewatering Plan.</p>
Social surroundings	<ul style="list-style-type: none"> <li>No significant impacts to Social surroundings are expected as a result of the Proposal</li> </ul>	<p>With the implementation of a CEMP and NVMP, PTA is confident that the EPA's objective for Social surroundings can be met.</p>	<p>In determining that the Proposal will not result in significant impacts to social surroundings, the PTA considered impacts to Aboriginal heritage values, historical heritage and potential impacts to sensitive receptors living in residential areas adjoining the Proposal including noise and vibration, loss of visual amenity and bushfire risk.</p> <p>The PTA applied The Principle of Intergeneration Equity -The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations by ensuring that mitigation measure such as noise walls and vibration matting would maintain the amenity of future generation at similar levels to those of the present generation. The use of Aboriginal monitors will also ensure Aboriginal heritage values are preserved for future generations.</p>

Environmental Factor	Significant residual impacts	Predicted outcomes	Connection to environmental principles / environmental objectives
			<p>Principles in relation to Improved Valuation, Pricing and Incentive Mechanisms were also applied. The PTA as the user of natural resources and assets, in this case the social environment, will pay for the use of those resources through the implementation of mitigation measures such as those to address noise and vibration and bushfire risk impacts, and will consider full lifecycle costs when determining mitigation measures.</p>



## 14. References

- 360 Environmental. 2014. Swan Valley Bypass NorthLink WA General Stratigraphy, Wetland Hydrology and Wetland Vegetation. Unpublished report prepared for MRWA, dated July 2014.
- AECOM. 2016. Ellenbrook Bus Rapid Transit Biological Assessment. Prepared for Department of Transport, Western Australia.
- AECOM. 2019. Flora, Vegetation, Fauna and Targeted Black Cockatoo Survey. Ellenbrook Barrambie Way New PM & ME. Report for the Water Corporation.
- Amergin Consulting. 2015. Report of an Aboriginal Heritage Desktop Assessment of the NorthLink WA Project (Perth-Darwin National Highway).
- ANZECC and ARMCANZ. 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Volume 1. The Guidelines. October. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.
- ARUP. 2019a. Metronet Morley Ellenbrook Line PDP Enabling Works, Package 3 – Malaga Station to Horse Swamp – Geotechnical Interpretive Report.
- ARUP. 2019b. Metronet Morley Ellenbrook Line PDP Enabling Works, Package 4 – Whiteman Park Station and New Lord Street Geotechnical Interpretive Report.
- ARUP. 2019c. Metronet Morley Ellenbrook Line PDP Enabling Works, Malaga and Whiteman Park Geotechnical Factual Report
- ARUP. 2019d. Metronet Morley Ellenbrook Line PDP Enabling Works, Ellenbrook Geotechnical Factual Report
- ARUP. 2020. Morley Ellenbrook Line (MEL) - Project Definition Plan (PDP) Flooding and Hydrology Report MEL-MNO-ARUP-DR-RPT-0001 D – FINAL
- Atlas of Living Australia (ALA). 2019. *Leioproctus douglasiellus*. Accessed December 2019. Online resource: <https://www.ala.org.au/>
- Aurora. 2017a. Preliminary Site Investigation Lots 352-355 Murray Road, Lot 10 Woollcott Avenue and Lot 822 Youle-Dean Road, Brabham WA. Aurora Environmental. Prepared for Department of Communities.
- Aurora. 2017b. Addendum to Preliminary Site Investigation Lots 352-355 Murray Road, Lot 10 Woollcott Avenue and Lot 822 Youle-Dean Road, Brabham WA. Aurora Environmental. Prepared for Department of Communities.
- Australian Government. 2008. Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan. 2008. Australian Government & Department of Environment and Conservation.
- Australian Government. 2012a. EPBC Act Environmental Offsets Policy. October 2012. Department of Sustainability, Environment, Water, Populations and Communities, Australia.
- Australian Government. 2012b. Commonwealth Offsets Assessment Guide. October 2012. Australia.
- Australian Government. 2019. Environment Protection and Biodiversity Conservation Act 1999. No 91, 1999. Registered 18 September 2019. Office of Parliamentary Counsel, Canberra.

- Bamford M; Morgan D & Gill H. 1998. Freshwater fish fauna of Bennett Brook. Unpublished report prepared for the Bennett Brook Catchment Group, dated 3/7/98.
- Bamford Consulting Ecologists. 2020a. Bennett Brook Frog Survey for the METRONET Bayswater to Ellenbrook project - Preliminary report Autumn 2020.
- Bamford Consulting Ecologists. 2020b. Kangaroo Management – Technical Advice.
- Bamford Consulting Ecologists. 2020c. METRONET Bayswater to Ellenbrook rail alignment. Additional information: fauna memo
- Bancroft, W. and Bamford, M. 2008. Frog monitoring at Whiteman Park. Unpubl. Report to Whiteman Park Authority by Bamford Consulting Ecologists, Kingsley.
- Barrett, R.L. 2012. *Poranthera moorokatta* (Phyllanthaceae), a rare new species from Perth, Western Australia. *Nuytsia*. 22(6): 399–407. 18 December 2012.
- Barrett, Russell L.; Barrett, Matthew D. 2015. Twenty-seven new species of vascular plants from Western Australia. *Nuytsia*. 26: 21-87. Retrieved 9 March 2016.
- Beard, J. S. 1979. Vegetation Survey of WA: The Vegetation of the Perth Area WA, map and explanatory memoir. 1:250,000 series, Vegmap Publications, Applecross.
- Beard, J. S. 1990. Plant Life of Western Australia, Kangaroo Press Pty Ltd, Kenthurst NSW.
- Bekele. 2006. Compilation and Assessment of Water Quality Data for the Superficial Aquifer, Gngangara Mound, Western Australia. CSIRO: Water for a Healthy Country National Research Flagship
- Biologic Environmental. 2020. Wetland Desktop Assessment - Malaga - Ellenbrook Rail Line
- Birdlife. 2015. Cocky Notes. Issue 22: Summer 2015.
- Birdlife Australia (Birdlife). 2018. Birdlife Australia 2018 Black Cockatoo breeding survey report.
- Bishop C., M. Williams, D. Mitchell, A. Williams, J. Fissioli & T. Gamblin. 2010. Conservation of the Graceful Sun-moth: Findings from the 2010 Graceful Sun-moth surveys and habitat assessments across the Swan, South West and southern Midwest Regions. Interim report. Kensington, Western Australia: Department of Environment and Conservation.
- Bourke, S.A. 2009. East Wanneroo integrated groundwater-lake flow modelling: Predictive scenario modelling to support the Gngangara Sustainability Strategy, Hydrogeological record series, report no. HG35, Department of Water, Perth.
- Brad Goode & Associates. 2015. Due Diligence Risk Assessment for the Proposed Lord Street Busway, from Bennett Springs to Ellenbrook, Western Australia. Unpublished report prepared for Main Roads Western Australia, Perth.
- Brad Goode & Associates. 2016. Addendum: Report on Aboriginal Heritage Survey for Site ID 551 Lord Street North 1, Whiteman Park, Western Australia. Unpublished report prepared for Main Roads Western Australia, Perth.
- Bureau of Meteorology. 2019. Climate Data Online, retrieved January 2019, from <http://www.bom.gov.au/climate/data/>.
- Bush, B., Maryan, B., Browne-Cooper, R. and Robinson, D. 2010. Field Guide to Reptiles and Frogs of the Perth Region. University of Western Australia Press.
- Car, C.A.; Wojcieszek, J.M. and Harvey, M.S. 2013. The millipede genus *Antichiropus* (Diplopoda: Polydesmida: Paradoxosomatidae) Part 1: Redefinition of the genus and redescrptions of existing

- species. Records of the Western Australian Museum. 28. 83-. 10.18195/issn.0312-3162.28(2).2013.083-118.
- Clifton, C. and Evans, R. 2001. Environmental Water Requirements of Groundwater Dependent Ecosystems. Environmental Flows Initiative Technical Report No. 2, Commonwealth of Australia, Canberra.
- Clohessy, S., Appleyard, S. and Vogwill, R. 2013. Groundwater acidification near the watertable of the Superficial aquifer, Gnangara Mound, Swan Coastal Plain, Western Australia. Applied Geochemistry, 36, 140-152.
- Coffey. 2015a. Level 2 Flora and Vegetation Assessment: Perth-Darwin National Highway. Prepared for Main Roads Western Australia, Perth.
- Coffey. 2015b. NorthLink WA Level 2 Targeted Fauna Assessment Perth-Darwin National Highway. Prepared for Main Roads Western Australia, Perth.
- Coffey. 2015c. Preliminary ASS Investigation: Perth-Darwin National Highway, NorthLink. Prepared for Main Roads Western Australia, Perth. Report number NLWA-00-EN-RP-0010.
- Coffey. 2015d. NorthLink WA Perth-Darwin National Highway Wetland Assessment. Prepared for Main Roads Western Australia, Perth. Coffey. 2015e. Public Environmental Review Perth-Darwin National Highway (Swan Valley Section) September 2015, Volume 1: Main text, Main Roads Western Australia, Perth.
- Coffey. 2015f. Northlink Preliminary Site Investigation. Prepared for Main Roads Western Australia. Report number NLWA-00-EN-RP-0011.
- Coffey. 2019. Groundwater Monitoring Well and Surface Water Staff Gauge Installation Report - Morley-Ellenbrook Line.
- Coffey. 2020a. METRONET Morley-Ellenbrook Line Preliminary Acid Sulfate Soils Investigation Part 2: Malaga to Ellenbrook Section. Report No. MEL-MNO-COFF-EN-RPT-0013. Prepared for Eco Logical Australia.
- Coffey. 2020b. METRONET Morley-Ellenbrook Line Preliminary Site Investigation Part 2: Malaga to Ellenbrook Section. Report No. MEL-MNO-COFF-EN-RPT-0011. Prepared for Eco Logical Australia.
- Coffey. 2020c. METRONET - Morley to Ellenbrook Line Baseline Hydrology 2018 - 2019 Annual Report.
- Coffey. 2020d. Quarterly GME Report – September to November 2019.
- Committee for Perth 2014 Bus Rapid Transit and Light Rail Transit, An Overview of Costs and Benefits.
- Commonwealth of Australia. 2001. Australia's Biodiversity Conservation Strategy 2010-2030. Prepared by the National Biodiversity Strategy Review Task Group convened under the Natural Resource Management Ministerial Council.
- Commonwealth of Australia. 2013. Survey Guidelines for Australia's Threatened Orchids Guidelines for Detecting Orchids Listed as 'Threatened' under the EPBC Act. [ONLINE] Available at: <http://www.environment.gov.au/system/files/resources/e160f3e7-7142-4485-9211-2d1eb5e1cf31/files/draft-guidelines-threatened-orchids.pdf>
- Commonwealth of Australia. 2018. Threat Abatement Plan for Disease in Natural Ecosystems caused by *Phytophthora cinnamomi*.

CRC for Catchment Hydrology. 2000. Water Sensitive Road Design – Design Options for Improving Stormwater Quality of Road Runoff. Technical Report 00/1, August 2000. Available at: <https://www.clearwatervic.com.au/user-data/resource-files/technical200001.pdf>

Davidson. 1995. Hydrogeology and groundwater resources of the Perth region, Western Australia: Western Australia Geological Survey, Bulletin no. 142. Perth, Western Australia.

DAWE. 2020. Species Profile and Threats Database:  
<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

Department of Biodiversity, Conservation and Attractions (DBCA). 2007-2019. NatureMap: Mapping WA's Biodiversity. [ONLINE] Available at: <https://naturemap.dpaw.wa.gov.au/>

DBCA. No Date. Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* Fauna Profile. Available at: [https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal\\_profiles/frtb\\_cockatoo\\_fauna\\_profile.pdf](https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/frtb_cockatoo_fauna_profile.pdf). Accessed 13 May 2020

Department of Biodiversity, Conservation and Attractions (DBCA). 2017. A methodology for the evaluation of wetlands on the Swan Coastal Plain, draft prepared by the Wetlands Section of the Department of Biodiversity, Conservation and Attractions and the Urban Water Branch of the Department of Water and Environmental Regulation, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA). 2018. Carnaby's Cockatoo Unconfirmed Roost Sites (DBCA-051). Data last updated 2018-11-27.

Department of Biodiversity, Conservation and Attractions (DBCA). 2019a. Threatened and Priority Fauna Database Search for the Morley to Ellenbrook Rail Project. Accessed on the 16 December 2019. Prepared by the Species and Communities Program for Eco Logical Australia for research purposes.

Department of Biodiversity, Conservations and Attractions (DBCA). 2019b. Threatened ecological communities. Accessed on 22 March 2019 at <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities>.

Department of Biodiversity, Conservation and Attractions (DBCA). 2019c. Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain (SCP) IBRA Region. Online dataset (DBCA-057). Available from: <https://catalogue.data.wa.gov.au/dataset/carnabys-cockatoo-unconfirmfeeding-areas-scp>.

Department of Biodiversity, Conservation and Attractions (DBCA). 2020. Geomorphic Wetlands, Swan Coastal Plain (DBCA-019). Data last updated 2020-01-18.

Department of Environment and Conservation. 2004. *Eucalyptus balanites* Interim Recovery Plan 2004-2009. Interim Recovery Plan no. 182. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation. 2006. Slender Andersonia (*Andersonia gracilis*) Interim Recovery Plan 2006-2011. Interim Recovery Plan No. 228. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation. 2008. Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii*) and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*) Recovery Plan. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation. 2009a. Glossy-leafed Hammer Orchid (*Drakaea elastica*) Recovery Plan. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation. 2009b Grand Spider Orchid (*Caladenia huegelii*) Recovery Plan. Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra.

Department of Environment and Conservation. 2009c. Keighery's Macarthuria (*Macarthuria keigheryi*) Recovery Plan. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC). 2011. A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Site Remediation and other Related Activities 2011. DEC. Perth.

Department of Environment and Conservation (DEC). 2012a. Woylie (*Bettongia penicillata ogilbyi*): Wildlife Management Program No. 51. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC). 2012b. Chuditch (*Dasyurus geoffroyi*) Recovery Plan. Wildlife Management Program No. 54. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC). 2012c. Western Trithuria (*Trithuria occidentalis*) Interim Recovery Plan 2012–2017. Interim Recovery Plan No. 327. Department of Environment and Conservation, Western Australia.

Department of Environment and Conservation (DEC). 2012d. A guide to managing and restoring wetlands in Western Australia. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC). 2012e. Fauna Profiles: Quenda *Isoodon obesulus*. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC) 2013. Definitions, Categories and Criteria for Threatened and Priority Ecological Communities. Department of Environment and Conservation, January 2013.

Department of the Environment (DotE). 2014. Environmental Management Plan Guidelines. Commonwealth of Australia.

Department of the Environment (DotE). 2015. Threat Abatement Plan for Predation by Feral Cats. Commonwealth of Australia.

Department of the Environment (DotE). 2016. Threat Abatement Plan for Competition and Land Degradation by Rabbits.

Department of the Environment and Energy (DotEE). 2016a. Banksia Woodlands of the Swan Coastal Plain: a nationally protected ecological community. Guide to the conservation listing advice, Commonwealth of Australia 2016.

Department of the Environment and Energy (DotEE). 2016b. Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain Ecological Community. Commonwealth of Australia, 2016.

Department of the Environment and Energy (DotEE). 2017. Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo. Commonwealth of Australia.

Department of the Environment and Energy (DotEE). 2019a. EPBC Referral Guidance - Banksia Woodlands of the Swan Coastal Plain Ecological Community. Commonwealth of Australia.



Department of the Environment and Energy (DotEE). 2019b. Species Profile and Threats Database: *Calyptorhynchus latirostris* - Carnaby's Cockatoo. [Online] Available at: [www.environment.gov.au/cgi-gin/sprat/public/publicspecies.pl?taxon\\_id=59523](http://www.environment.gov.au/cgi-gin/sprat/public/publicspecies.pl?taxon_id=59523)

Department of the Environment and Energy (DotEE). 2019c. Species Profile and Threats Database: *Calyptorhynchus baudinii* - Baudin's Cockatoo. [Online] Available at: [www.environment.gov.au/cgi-gin/sprat/public/publicspecies.pl?taxon\\_id=769](http://www.environment.gov.au/cgi-gin/sprat/public/publicspecies.pl?taxon_id=769)

Department of the Environment and Energy (DotEE). 2019d. Species Profile and Threats Database: *Calyptorhynchus banksii naso* - Forest Red-tailed Black Cockatoo. [Online] Available at: [www.environment.gov.au/cgi-gin/sprat/public/publicspecies.pl?taxon\\_id=67034](http://www.environment.gov.au/cgi-gin/sprat/public/publicspecies.pl?taxon_id=67034)

Department of the Environment and Energy (DotEE). 2019e. Species Profile and Threats Database. [Online] Available at: [www.environment.gov.au/cgi-gin/sprat/public/sprat.pl](http://www.environment.gov.au/cgi-gin/sprat/public/sprat.pl)

Department of the Environment and Energy (DotEE). 2019f. Species Profile and Threats Database: *Plegadis falcinellus* - Glossy Ibis. [Online] Available at: [www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=991](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=991)

Department of Environment Regulation. 2014. Assessment and management of contaminated sites. Contaminated sites guidelines.

Department of Environment Regulation. 2015a. Identification and investigation of acid sulfate soils and acidic landscapes.

Department of Environment Regulation. 2015b. Treatment and management of soil and water in acid sulfate soil landscapes.

Department of the Environment, Water, Heritage and the Arts. 2008a. Approved Conservation Advice for *Eleocharis keigheryi* (Keighery's Eleocharis). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. 2008b. Approved Conservation Advice for *Lepidosperma rostratum* (Beaked Lepidosperma). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. 2008c. Approved Conservation Advice for *Hydatella dioica* (One-sexed Hydatella). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. 2008d. Threat Abatement Plan for Predation by the European Red Fox.

Department of the Environment, Water, Heritage and the Arts. 2008e. Approved Conservation Advice for *Anigozanthos viridis* subsp. *terraspectans* (Dwarf Green Kangaroo Paw). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. 2008f. Approved Conservation Advice for *Diuris purdiei* (Purdie's Donkey-orchid). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. 2008g. Approved Conservation Advice for *Grevillea christineae* (Christine's Grevillea). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. 2008h. Approved Conservation Advice for *Diuris micrantha* (Dwarf Bee-orchid). Canberra: Department of the Environment, Water, Heritage and the Arts.

Department of the Environment, Water, Heritage and the Arts. (DEWHA). 2009. Grand Spider Orchid (*Caladenia huegelii*) Recovery Plan. Commonwealth of Australia.

Department of the Environment, Water, Heritage and the Arts. (DEWHA). 2010. Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act.

Department of the Environment, Water, Heritage and the Arts (DEWHA). 2013a. Significant Impact Guidelines 1.1 - Matters of National Environmental Significance. Canberra, ACT. Commonwealth of Australia

Department of the Environment, Water, Heritage and the Arts (DEWHA). 2013b. Survey guidelines for Australia's threatened orchids: Guidelines for detecting orchids listed as 'Threatened' under the Environment Protection and Biodiversity Conservation Act 1999 (

Department of Fire and Emergency Services (DFES). 2018. Western Australia State Map of Bush Fire Prone Areas.

Department of Health (DoH). 2009. Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. Prepared by the Western Australian Department of Health.

Department of Health (DoH). 2014. Contaminated Sites Ground and Surface Water Chemical Screening Guidelines.

Department of Planning, Lands and Heritage (DPLH) 2018. North East Sub regional Planning Framework, March 2018. Western Australian Planning Commission, Perth.

Department of Planning, Lands and Heritage (DPLH) and the Western Australian Planning Commission (WAPC). 2018. Perth and Peel@3.5million. Prepared by the Western Australian Department of Planning, Lands and Heritage.

Department of Parks and Wildlife (DPaW). 2013. Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Department of Parks and Wildlife, Perth, Western Australia. Available from: <http://www.environment.gov.au/resource/carnaby%E2%80%99s-cockatoo-calyptorhynchus-latirostris-recovery-plan>.

Department of Parks and Wildlife. 2015: FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the Department, Forest and Ecosystems Management, Department of Parks and Wildlife, 5 March 2015.

Department of Parks and Wildlife (DPaW). 2017. Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan. Wildlife Management Program No. 58. Department of Parks and Wildlife, Perth, WA. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/recovery/western-ringtail-possum-recovery-plan>

Department of Premier and Cabinet (DPC). 2015. Draft Perth and Peel Green Growth Plan for 3.5 million. <https://www.dpc.wa.gov.au/Consultation/StrategicAssessment/Pages/Draft-Green-Growth-Plandocuments.aspx>. Department of Premier and Cabinet, West Perth, Western Australia.

Department of Sustainability, Environment, Water, Populations and Communities (DSEWPAC). 2011a. Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act. Commonwealth of Australia.



Department of Sustainability, Environment, Water, Populations and Communities (DSEWPAC) (DSEWPAC). 2011b. Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act

Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC). 2012a. Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC). 2012b. How to use the Offsets assessment guide. Commonwealth of Australia.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC). 2012c. EPBC Act referral guidelines for three threatened black cockatoo species. Commonwealth of Australia.

Department of Water (DoW). 2006. Water Quality Protection Note 10: Contaminant Spills Emergency Response. Department of Water, Government of WA.

Department of Water (DoW). 2007. Water Quality Protection Note 83: Infrastructure Corridors Near Sensitive Water Resources. Department of Water, Government of WA.

Department of Water (DoW). 2008. Perth Regional Aquifer Modelling System (PRAMS) Model Development: Hydrogeology and Groundwater Modelling. Hydrogeological record series HG 20.

Department of Water (DoW). 2009. Environmental considerations for groundwater management in the Northern Perth Basin. Environmental Water Report Series: Report no. 8. Department of Water, Government of WA.

Department of Water (DoW). 2016. Water Quality Protection Note No. 25, Land use compatibility tables for public drinking water source areas.

Department of Water and Environmental Regulation (DWER) and Water Corporation. 2017. METRONET Water Considerations. Dated July 2017.

Department of Water and Environmental Regulation (DWER). 2018. Water Quality Protection Note 56: Tanks for Fuel and Chemical Storage Near Sensitive Water Resources. Dated December 2018.

Department of Water and Environmental Regulation (DWER). 2019a. Perth Groundwater Map – Online Resource. Accessed from <https://maps.water.wa.gov.au/#/webmap/gwm> on 9 September 2019.

Department of Water and Environmental Regulation (DWER). 2019b. 2018 Western Australian air monitoring annual report under the National Environment Protection (Ambient Air Quality) Measure, dated October 2019.

Department of Water and Environmental Regulation (DWER). 2020a. Water information reporting website: <https://www.water.wa.gov.au/maps-and-data/monitoring/water-information-reporting>. Accessed in May 2020.

Department of Water and Environmental Regulation (DWER). 2020b. The Gnangara groundwater system: <https://www.water.wa.gov.au/water-topics/groundwater/gnangara-groundwater-system>. Accessed 17 May 2020.

Department of Water and Environmental Regulation (DWER). 2020c Water Information Reporting portal: <https://www.water.wa.gov.au/maps-and-data/maps/water-information-reporting2>. Accessed June 2020.

Drake, P., Froend, R. and Franks, P. 2011. Linking hydraulic conductivity and photosynthesis to water-source partitioning in trees versus seedlings. *Tree Physiology* 31: 763-773.

Eamus, D., Froend, R., Loomes, R., Hose, G., & Murray, B. 2006. A functional methodology for determining the groundwater regime needed to maintain the health of groundwater-dependent vegetation. *Australian Journal of Botany*, 54 (2), 97- 114.

Eamus D, Froend R. 2006. Groundwater-dependent ecosystems: the where, what and why of GDEs. *Australian Journal of Botany*, 54, 91-96.

Eco Logical Australia (ELA). 2019a. Morley–Ellenbrook Line Environmental Constraints Desktop Analysis. Prepared for the Public Transport Authority, Perth, Western Australia.

Eco Logical Australia (ELA). 2019b. Yanchep Rail Extension: Part 2 – Eglinton to Yanchep. Environmental Review Document Prepared for Public Transport Authority

Eco Logical Australia (ELA). 2020. Terrestrial Fauna and Black Cockatoo Assessment: Morley to Ellenbrook Line. Report prepared for Perth Transport Authority.

Environmental Protection Authority (EPA). 2006. Guidance Statement 6 – Rehabilitation of Terrestrial Ecosystems. Perth, Western Australia. Published December 2006

Environmental Protection Authority (EPA). 2013a. Environmental Protection Bulletin 20 – Protection of naturally vegetated areas through planning and development. Perth, Western Australia. Published December 2013.

Environment Protection Authority (EPA). 2013b. Rail Infrastructure Noise Guideline. Environment Protection Authority, Sydney, NSW.

Environmental Protection Authority (EPA). 2016a. Environmental Factor Guideline: Flora and Vegetation, EPA, Western Australia. Published 13 December 2016.

Environmental Protection Authority (EPA). 2016b. Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment. Perth, Western Australia. Published December 2016.

Environmental Protection Authority (EPA). 2016c. Environmental Factor Guideline: Terrestrial Fauna, EPA, Western Australia. Published 13 December 2016.

Environmental Protection Authority (EPA). 2016d. Technical Guidance: Sampling Methods for Terrestrial Vertebrate Fauna. EPA, Perth, Western Australia. Published December 2016.

Environmental Protection Authority (EPA). 2016e. Technical Guidance: Terrestrial Fauna Surveys. Perth, Western Australia. Published December 2016.

Environmental Protection Authority (EPA). 2016f. Technical Guidance: Sampling of Short Range Endemic Invertebrate Fauna. Perth, Western Australia. Published December 2016.

Environmental Protection Authority (EPA). 2016g. Environmental Factor Guideline: Terrestrial Environmental Quality, EPA, Western Australia. Published 13 December 2016.

Environmental Protection Authority (EPA). 2016h. Environmental Factor Guideline: Social Surroundings, EPA, Western Australia. Published December 2016.

Environmental Protection Authority (EPA). 2018a. Environmental Factor Guideline: Inland Waters. Environmental Protection Authority, Perth, Western Australia.

Environmental Protection Authority (EPA). 2018b. Statement of Environmental Principles, Factors and Objectives. EPA, Perth, Western Australia. Published June 2018.

Environmental Protection Authority (EPA). 2018c. Environmental Factor Guideline: Landforms. Environmental Protection Authority, Perth, Western Australia.

- Environmental Protection Authority (EPA). 2018d. Environmental Factor Guideline: Greenhouse Gas Emissions. Environmental Protection Authority, Perth, Western Australia.
- Environmental Protection Authority (EPA). 2019. Carnaby's Cockatoo in Environmental Impact Assessment in the Perth and Peel Region. EPA, Perth, Western Australia
- Environmental Protection Authority (EPA). 2020. Instructions on how to prepare an Environmental Review Document, EPA, Western Australia. Published March 2020.
- Estill & Associates. 2005. Study of Groundwater-Related Aboriginal Cultural Values on the Gnangara Mound, Western Australia. Report prepared for the Department of Environment. Perth, Western Australia
- Ethnoscience. 2017. Report on a Desktop Aboriginal Heritage Assessment of Whiteman Park South Project Area. Unpublished report prepared for the Western Australian Planning Commission, Perth.
- Froend Bowen and Associates (FBA). 2004. Review of Drawdown Impacts on Groundwater Dependent Vegetation and Wetlands. Unpublished prepared for Iluka Resources Ltd, prepared by R. Froend and R. Loomes.
- Froend, R.H. and Drake, P.L. 2006. Defining phreatophyte response to reduced water availability: preliminary investigations on the use of xylem cavitation vulnerability in Banksia woodland species. *Australian Journal of Botany* 54: 173-179.
- Froend, R and Loomes, R. 2004. Approach to determination of ecological water requirements for groundwater-dependent ecosystems in Western Australia. A report to the Department of Environment, Edith Cowan University, Perth.
- Froend, R and Loomes, R. 2006. Determination of ecological water requirements for groundwater-dependent ecosystems – southern Blackwood and eastern Scott Coastal Plain. Report for the Department of Water, Edith Cowan University, Perth.
- Galeotti DM, McCullough CD & Lund MA 2010 Black-stripe Minnow *Galaxiella nigrostriata* (Shipway 1953) (Pisces: Galaxiidae), a review and discussion *Journal of the Royal Society of Western Australia* 93, 13-20.
- Geological Survey Western Australia and Geoscience Australia. 2008. Surface Geology of Australia 1:250,000 Western Australia
- GHD. (2020a). METRONET Potential Offset Sites - Lowlands Site Environmental Values Assessment. February 2020. GHD Perth WA. IBSA Number: IBSA-2020-0103
- GHD. (2020b). Keysbrook Site Environmental Values Assessment. January 2020. GHD Perth WA. IBSA Number: IBSA-2020-0102
- Gibson, N., Keighery, B.J., Keighery, G.J., Burbidge, A.H and Lyons, M.N. 1994. A Floristic Survey of the Southern Swan Coastal Plain. Unpublished report for the Australian Heritage Commission prepared by Department of conservation and Land Management and the Conservation Council of Western Australia.
- Glevan Consulting (Glevan). 2020. *Phytophthora* Dieback occurrence assessment – Version 1.0. Unpublished report prepared for the PTA.
- Golder. 2015a. Preliminary Site Investigation: Former liquid waste disposal facility. Golder Associates. Prepared for LandCorp.
- Golder. 2015b. Detailed Site Investigation: Lexia Liquid Waste Disposal Facility. Golder Associates. Prepared for LandCorp.
- Golder. 2016. Groundwater Monitoring Event Lexia Liquid Waste Disposal Facility. Golder Associates. Prepared for LandCorp.

Golder Associates. 2016. Lexia Liquid Waste Disposal Facility Groundwater Monitoring Event. Golder Associates. Prepared for LandCorp.

Golder, 2020a. METRONET – Morley to Ellenbrook Line (MEL) Malaga to Ellendale Rail Works Strategic Level Hydrogeological Assessment.

Golder, 2020b. Dewatering predictions (awaiting document to reference)

Golder. 2020c. METRONET – Morley to Ellenbrook Line (MEL) Malaga to Ellenbrook Rail Works Strategic Level Hydrogeological Assessment. Prepared for Public Transport Authority.

Government of WA. 1997. Wetlands Conservation Policy for Western Australia. Prepared by the Department of Conservation and Land Management and Waters and Rivers Commission. Perth, Western Australia.

Government of WA. 2000a. Bush Forever Volume 1: Policies, Principles and Processes. Perth, Western Australia.

Government of WA. 2000b. Bush Forever Volume 2: Directory of Bush Forever Sites. Perth, Western Australia.

Government of WA. 2011a. WA Environmental Offsets Policy. Published September 2011.

Government of WA. 2011b. WA Environmental Offsets Policy. Published September 2011.

Government of WA. 2013. Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. October 2013. Department of Parks and Wildlife (DPAW). Perth WA.

Government of WA. 2014a. WA Environmental Offsets Guidelines. Published August 2014.

Government of WA. 2014b. WA Environmental Offsets Template. August 2014. Perth WA.

Government of WA. 2019a. 2018 South West Vegetation Complex Statistics. Current as of March 2019. WA, Department of Biodiversity Conservation and Attractions, Perth.

Government of WA. 2019b. 2018 South West Vegetation Complex Statistics incorporating the CAR Reserve (Full Report). Current as of March 2019. WA, Department of Biodiversity Conservation and Attractions, Perth.

Government of WA. 2019c. Environmental Protection Act 1986. January 2019. State of Western Australia.

Government of WA. 2019d. EPA Technical Report: Carnaby's Black Cockatoo in Environmental Impact Assessment in the Perth and Peel Region. May 2019, Perth WA.

Government of WA. 2020. *Western Australian Government Gazette*. Perth, Friday, 28 February 2020. No. 29. State of Western Australia.

Gozzard, J. R. 2007. Geology and landforms of the Perth Region. Western Australia Geological Survey, Perth, Western Australia.

Groom, C. 2011. Plants Used by Carnaby's Black Cockatoo. Department of Environment and Conservation, Perth, Western Australia.

Groom, P.K., Froend, R.H. and Mattiske, E.M. 2000. Impact of groundwater abstraction on a Banksia woodland, Swan Coastal Plain, Western Australia. *Ecological Management and Restoration* 1 (2): 117-124.

Hatton, T and Evans, R. 1998. Dependence of ecosystems on groundwater and its significance to Australia, LWRRDC Occasional Paper No. 12/98, LWRRDC, Canberra.

- Hedde, E.M., Loneragan, O.W. and Havel J.J. 1980. Vegetation Complexes of the Darling System, WA, in Atlas of Natural Resources, Darling System WA, Department of Conservation and Environment.
- Hill, AL, Semeniuk, CA, Semeniuk, V and Del Marco A 1996, Wetlands of the Swan Coastal Plain Volume 2A: Wetland Mapping, Classification and Evaluation, Main Report, Water and Rivers Commission and Department of Environmental Protection, Perth.
- Invertebrate Solutions. 2019. Desktop review and impact assessment of Subterranean Fauna for the Morley-Ellenbrook Line, Perth, Western Australia. Report prepared for Public Transport Authority. August 2019.
- Invertebrate Solutions. 2020. Baseline Short Range Endemic and Conservation Significant Invertebrate Survey for the Malaga to Ellenbrook Rail Works, Western Australia. Report prepared for Public Transport Authority.
- Jacobs Australia Pty Ltd (Jacobs). 2018. Morley to Ellenbrook Route protection study, MEL Option 2 Environment and Heritage Assessment, unpublished report prepared for Public Transport Authority, Perth.
- Jacobs Australia Pty Ltd (Jacobs). 2019. Yanchep Rail Extension Part 2 Qualitative Air Quality Assessment.
- JDA Consulting (JDA). 2017. Department of Housing Landholding, Brabham Groundwater & Surface Water Monitoring Summary Report (2015 –2016). Prepared for the Department of Housing, April 2017
- Johnstone, R. E., Johnstone, C. and Kirkby, T. 2011. Black cockatoos on the Swan Coastal Plain. Report prepared for the Department of Planning, Western Australia, by the Western Australian Museum, Welshpool, Western Australia.
- Judd, S. 2019. Isopods from the Malaga to Ellenbrook Rail Works. Unpublished report to Invertebrate Solutions December 2019, 2p.
- Keighery B.J., Keighery G.J., Longman V.M. and Clarke K.A. 2012. Native and Weed Flora of the Southern Swan Coastal Plain: 2005 Dataset. Department of Environment and Conservation, Kensington, Western Australia.
- Kirkby. 2020. Inspection of Possible Black Cockatoo (*Calyptorhynchus Spp.*) Breeding Hollows, Bayswater to Ellenbrook Line.
- Klunzinger MW. 2012. Ecology, life history and conservation status of *Westralunio carteri* Iredale 1934, an endemic freshwater mussel of south-western Australia. PHD Thesis. Murdoch University, Perth Western Australia.
- Klunzinger MW, Beatty SJ, Morgan DL, Pinder AM, and Lymbery AJ. 2015. Range decline and conservation status of *Westralunio carteri* Iredale, 1934 (Bivalvia:Hyriidae) from south-western Australia. Australian Journal of Zoology, 63(2), 127–135.
- Knott B, Jasinska EJ & Smith KD 2002 Limnology and aquatic fauna of SPP173, Melaleuca Park, refuge for an outlier population of the black-stripe Minnow *Galaxiella nigrostriata* (Galaxiidae), in south-western Australia. Records of the Western Australian Museum 21, 291-298
- Land and Water Australia. 2007a. A Framework for assessing the Environmental Water Requirements of Groundwater Dependent Ecosystems – Report 1: Assessment Toolbox.
- Land and Water Australia. 2007b. A Framework for assessing the Environmental Water Requirements of Groundwater Dependent Ecosystems – Report 3: Implementation.



Main Roads Western Australia (MRWA). 2015a. Position paper NorthLink WA - Hydrogeological PER considerations - Groundwater level impact from construction, dewatering and groundwater abstraction.

Main Roads Western Australia (MRWA). 2015b. Position Paper: NorthLink WA – Road Embankment Assessment (Groundwater).

Main Roads Western Australia (MRWA). 2015c. Swan Valley Bypass NorthLink WA General Stratigraphy, Wetland Hydrology and Wetland Vegetation

Main Roads Western Australia (MRWA). 2015d. NorthLink WA Perth–Darwin National Highway Wetland Assessment.

Main Roads Western Australia (MRWA). 2017. Condition Environmental Management Plan, Inland Waters Environmental Quality – Hydrological Processes. Perth–Darwin National Highway (Swan Valley Section)

METRONET. 2018. Morley-Ellenbrook Line Long List Working Paper.

METRONET. 2019a. Australian Government and Government of WA. Available on: <https://www.metronet.wa.gov.au/>.

METRONET. 2019b. Morley-Ellenbrook Line Stage 3 Business Case.

METRONET. 2019c. METRONET Sustainability Strategy 2019 – 2022.

METRONET. 2020a. METRONET Aboriginal Heritage Management Plan.

METRONET. 2020b. METRONET Engagement of Aboriginal Heritage Monitors Procedure.

Mitchell D, Williams K, and D Anthony. 2002. Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion).

Molloy, S., O'Connor, T., Wood, J. and Wallrodt, S. (2007) Addendum for the South West Biodiversity Project Area, Western Australian Local Government Association, West Perth

Morcombe, M. 2000. Field Guide to Australian Birds. National Environmental Protection Council (NEPC). 2019. National Environment Protection (Ambient Air Quality) Standard.

National Health and Medical Research Council and Natural Resource Management Ministerial Council (NHMRC & NRMCMC). 2018. National Water Quality Management Strategy, Australian Drinking Water Guidelines 6 2011 (Version 3.5 Updated August 2018).

North Metro Catchment Group. 2006. Freshwater Fish Survey of Bennett Brook.

Northern Territory Environmental Protection Authority (NTEPA) 2013. Guideline on Conceptual Site Models. Draft, Version 1.2, May 2013

NorthLinkWA Perth-Darwin National Highway. 2015. Public Environmental Review – Perth-Darwin National Highway (Swan Valley Section). Public Environmental Review.

Peck, G. Barrett and M. Williams. 2017. The 2017 Great Cocky Count. Birdlife Western Australia. Floreat WA.

Pen, L.J., Gill, H.S., Humphries, P., and Potter, I.C. (1993) Biology of the black-stripe Minnow *Galaxiella nigrostriata*, including comparisons with the other two *Galaxiella* species. *Journal of Fish Biology* 43, 847-863.

Playford et al. 1976. Geology of the Perth Basin, Western Australia. Western Australia Geological Survey, Bulletin 124.

- PGV Environmental. 2014a. Lot 800 Youle-Dean Road – Black Cockatoo Habitat Assessment. Prepared for Department of Housing, Western Australia.
- PGV Environmental. 2014b. Brabham LSP 3 Area – Black Cockatoo Habitat Assessment. Prepared for Department of Housing, Western Australia.
- Planning and Transport Research Centre. 2004. Perth's South West Metropolitan Railway Balancing benefits and costs. Unpublished report prepared for the Public Transport Authority of Western Australia, dated February 2004.
- PPK. 2002. Investigation into the Suitability of the Marshall Road Precinct for Development for Urban Purposes. Prepared for Whiteman Park Board.
- Public Transport Authority (PTA). 2016. PTA Urban Rail Reserve Vegetation Management Plan. Unpublished report prepared by the PTA.
- Public Transport Authority (PTA). 2018. Bushfire Management Strategy. [https://www.pta.wa.gov.au/Portals/15/AA\\_DOCUMENTS/Bushfire%20Management%20Strategy.pdf](https://www.pta.wa.gov.au/Portals/15/AA_DOCUMENTS/Bushfire%20Management%20Strategy.pdf), Public Transport Authority.
- Public Transport Authority (PTA). 2020. Offsets Strategy. Malaga to Ellenbrook Rail Works Proposal. June 2020.
- Purdie, B, R, Tille, P. J. and Schoknecht. 2004. Soil-landscape mapping in south-western Australian: an overview of methodology and outputs.
- R. & E. O'Connor Pty Ltd. 2018. Desktop Aboriginal Heritage Analysis of Proposed Morley to Ellenbrook Railway Line. Unprepared report prepared for Public Transport Authority, Perth.
- R. & E. O'Connor Pty Ltd. 2019. Aboriginal Heritage Survey: Morley Ellenbrook Railway Line. Unpublished report prepared for Public Transport Authority, Western Australia.
- Rentz, D.C.F. 1993. Tettigoniidae of Australia 2. The Austrosaginae, Zaprochilinae and Phasmodinae. Australia: CSIRO Vol. 2 386 pp. 327.
- Richardson, E., Irvine, E., Froend, R., Book, P., Barber, S., & Bonneville, B. 2011. Australian groundwater dependent ecosystems toolbox part 1: assessment framework, National Water Commission, Canberra.
- Rix, M. G., Huey, J. A., Cooper, S., Austin, A. D., & Harvey, M. S. 2018. Conservation systematics of the shield-backed trapdoor spiders of the nigrum-group (Mygalomorphae, Idiopidae, Idiosoma): integrative taxonomy reveals a diverse and threatened fauna from south-western Australia. *ZooKeys*, (756), 1–121. <https://doi.org/10.3897/zookeys.756.24397>
- Roberts, N. 2016. Carnaby's cockatoos breeding program hailed a success for Perth university. Available from: <https://www.abc.net.au/news/2016-12-20/carnaby-cockatoos-breeding-program-edith-cowansuccess/8134164>. Accessed February 2020.
- RPS. 2015. Due Diligence Report Long-stay Caravan Park, Marshall Road, Whiteman. Prepared for the Department of Housing.
- RPS, 2019. METRONET Morley-Ellenbrook Line. MEL Hydrology Fieldwork 0 Q1 2019.
- RPS. 2020. Detailed Flora and Vegetation Assessment. METRONET Morley-Ellenbrook line. Prepared for Public Transport Authority, Western Australia.
- Rutherford, J., Roy, V., & S.L., J. 2005. The hydrogeology of the groundwater dependent ecosystems in the northern Perth basin, Department of Environment, Hydrogeological record series, HG11.



- Salama, R.B., Silberstein, R., and Pollock, D. 2005. Soils Characteristics of the Bassendean and Spearwood Sands of the Gnangara Mound (Western Australia) and their controls on Recharge, Water Level Patterns and Solutes of the Superficial Aquifer.
- Semeniuk, C.A. 1987. Wetlands of the Darling System — a geomorphic approach to habitat classification. *Journal Royal Society Western Australia* 69: 95–112.
- Senversa. Sampling and Analysis Quality Plan, Tonkin Gap Project. Prepared for Main Roads Western Australia.
- SERCUL. 2013. Bennett Brook catchment – water and sediment quality monitoring and evaluation: Ten-year Analysis 2002-2011. Beckenham, WA
- SERCUL. 2019. Winter and sediment quality in the Bennett Brook catchment. Winter – Spring 2018. Prepared by the South East Regional Centre for Urban Landcare for the City of Swan, City of Bayswater and the Department of Planning Lands and Heritage (Whiteman Park).
- Shand, P., Appleyard, S., Simpson S.L., Degens, B. 2018. National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soil in shallow groundwater environment. Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.
- Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. 2002, Native Vegetation in WA - Extent, Type and Status, Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- SLR. 2019. Morley-Ellenbrook Line: Preliminary Design Noise and Vibration Assessment - Part 2. May. Report prepared for Public Transport Authority, Western Australia.
- SLR. 2020a. Morley-Ellenbrook Line Part 2 Malaga to Ellenbrook Noise and Vibration Management Plan. May. Report prepared for Public Transport Authority, Western Australia.
- SLR. 2020b. Morley-Ellenbrook Line: Noise and Vibration Assessment Malaga to Ellenbrook – Part 2 Road and Rail. Report prepared for Public Transport Authority, Western Australia.
- South East Regional Centre for Urban Landcare (SERCUL). 2013. Bennett Brook catchment - water and sediment quality monitoring and evaluation: Ten-year Analysis 2002-2011, unpublished report prepared for the Swan River Trust.
- Southmetro Connect. 2011. Roe Highway Extension Public Environmental Review. Available at: <https://www.epa.wa.gov.au>
- Standards Australia. 2018. Mechanical vibration and shock - Evaluation of human exposure to whole body vibration (2631.5:2018). Standards Australia, NSW.
- Swartz, N. 2007. Integrated Conservation of the Rare and Endangered Terrestrial Orchid *Caladenia huegelii*. Thesis submitted for Doctor of Philosophy at the University of Western Australia's School of Earth and Geographical Sciences.
- Terratree. 2014. *Phytophthora* dieback Linear Assessment. Perth-Darwin National Highway project Corridor. Report prepared for Coffey Western Australia.
- Terrestrial Ecosystems. 2018. Level 1 Fauna Risk Assessment and Black-Cockatoo Habitat Assessment for the alternative Ellenbrook Rail Line Alignments of Metronet. Prepared for RPS Australia Asia Pacific.
- Terrestrial Ecosystems. 2020. Wetland and Migratory Bird Survey in the Whiteman Park Area. Prepared for the Western Australian Planning Commission.

- Thackway and Cresswell. 1995. An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves, Version 4.0. Australian Nature Conservation Agency, Canberra.
- Tiner, R.W., 1999. Wetland indicators; a guide to wetland identification, delineation, classification and mapping. Lewis, Boca Raton
- Tingay and Associates. 1998. Strategic plan for Perth's greenways. Perth, W.A.
- Threatened Species Scientific Committee (TSSC). 2015. Conservation Advice *Calytrix breviseta* subsp. *breviseta* swamp starflower. Canberra: Department of the Environment.
- Threatened Species Scientific Committee (TSSC). 2016c. Conservation Advice *Grevillea curviloba* subsp. *curviloba* curved-leaf grevillea. Canberra: Department of the Environment.
- Threatened Species Scientific Committee (TSSC). 2016b. Conservation Advice *Thelymitra dedmaniarum* cinnamon sun orchid. Canberra: Department of the Environment and Energy.
- Threatened Species Scientific Committee (TSSC). 2016a. Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community. Canberra: Department of the Environment and Energy.
- Threatened Species Scientific Committee (TSSC). 2018a. Conservation advice: *Galaxiella nigrostriata* Black-stripe Minnow. February 2018.
- Threatened Species Scientific Committee (TSSC). 2018b. Conservation Advice *Westralunio carteri* Carter's Freshwater Mussel. Canberra: Department of the Environment and Energy.
- Threatened Species Scientific Committee (TSSC). 2018c. Conservation Advice *Diplolaena andrewsii*. Canberra: Department of the Environment and Energy.
- Threatened Species Scientific Committee (TSSC). 2019. Conservation Advice *Botaurus poeciloptilus* Australasian Bittern. Canberra: Department of the Environment and Energy
- Van Dyck, S. & R. Strahan. 2008. The Mammals of Australia, Third Edition. Page(s) 880. Sydney: Reed New Holland.
- Warren, K., Shephard, J., Yeap, L., Jackson, B., Vaughan-Higgins, R., Donaldson, R., Mitchell, D., Barrett, G., Dawson, R., Mawson, P., Saunders, D. & Bouten, W. 2019. Conservation management for the long-term survivorship of Black Cockatoos endemic to the south-west of Western Australia: the application of telemetry to determine spatial ecology on the Perth-Peel Coastal Plain, south-west forest region and key breeding sites in response to a changing environment. April 2019. A/Professor Kristin Warren et al. Murdoch University, Perth WA.
- Waters and Rivers Commission. 2000. Environmental Water Provisions Policy for Western Australia. Water and Rivers Commission, Statewide Policy No. 5.
- Webb, A., Kinloch, J., Keighery, G. and Pitt, G. 2016. The extension of vegetation complex mapping to landform boundaries within the Swan Coastal Plain landform and forested region of south-west Western Australia. September. Accessed on 17 January 2019 at <https://library.dbca.wa.gov.au/static/FullTextFiles/072149/072149.e.pdf>
- Western Australian Herbarium (WAH). 2020. FloraBase – The Western Australian Flora. Online database of the Western Australian Herbarium. <https://florabase.dpaw.wa.gov.au/>. Department of Environment and Conservation, Kensington.
- Western Australian Local Government Association (WALGA). 2004. Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region. Western Australian Local Government Association and Perth Biodiversity Project, West Perth, WA.

Western Australian Planning Commission (WAPC). 2003. Statement of Planning Policy No. 2.7 Public Drinking Water Source Policy. Western Australian Gazette, Special Gazette No. 92, 10 June 2003.

Western Australian Planning Commission (WAPC). 2005a. Statement of Planning Policy 2.2 Gnangara Groundwater Protection. Western Australian Gazette, Special Gazette No. 150, 5 August 2005.

Western Australian Planning Commission (WAPC). 2005b. Guideline for the Determination of Wetland Buffer Requirements. Draft for public comment December 2005

Western Australian Planning Commission (WAPC). 2006. Statement of Planning Policy 2.9 Water Resources. Western Australian Gazette, Special Gazette No. 227, 19 December 2006.

Western Australian Planning Commission (WAPC). 2007. Visual Landscape Planning in Western Australia, a manual for evaluation, assessment, siting and design. Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC). 2010. State Planning Policy No. 2.8 Bushland Policy for the Perth Metropolitan Region. Western Australian Planning Commission, Perth, Western Australia.

Western Australian Planning Commission (WAPC). 2015. State Planning Policy 3.7: Planning in Bushfire Prone Areas. Department of Planning, Lands and Heritage, Western Australia

Western Australian Planning Commission (WAPC). 2019a. Whiteman Park Conservation and Environmental Management Plan. Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC). 2019b. State Planning Policy 5.4: Road and Rail Noise. Department of Planning, Lands and Heritage, Western Australia.

Western Australian Planning Commission (WAPC). 2019c. Road and Rail Noise Implementation Guidelines. Department of Planning, Lands and Heritage, Western Australia.

Western Australian Planning Commission (WAPC). (2019d). *Metropolitan Region Scheme Amendment 1335/57 (Minor Amendment) Bush Forever Omnibus 3 (South) Amendment Report*. March 2019. Western Australian Planning Commission (WAPC). Perth WA.

Wetland Research & Management (WRM). 2019. Metronet Morley-Ellenbrook Line: Wetland Values Desktop Assessment.

Wetland Research & Management (WRM). 2020. Interoffice memorandum - MEL Project 27: Bennett Brook Mussel Targeted Survey, Autumn 2020. Unpublished memo prepared for ELA, 6 May 2020.

Wills RT and Keighery GJ. 1994. Ecological impact of plant disease on plant communities. Journal of the Royal Society of Western Australia.

Whiteman Park. 2019. Whiteman Park. Sponsored by DPLH and WAPC. Accessed 20/02/2019. <https://www.whitemanpark.com.au>

Woodman Environmental. 2015. Spring Surveys and Analysis to Investigate SCP02 Presence – Perth-Darwin National Highway. Unpublished report prepared for MRWS.

Woodman Environmental. 2020a. Targeted Banksia Woodlands TEC Assessment at Malaga Station – Patch 1. Unpublished report prepared for PTA.

Woodman Environmental. 2020b. Banksia Woodland Community Assessment – Patch 5. Unpublished report prepared for PTA.

# 15. Appendices

# Appendix A Environmental Scoping Document

# Appendix B Additional information Fauna Memorandum (Black Cockatoo and Black Striped Minnow) Bayswater to Ellenbrook rail alignment

# Appendix C SRE and Conservation Significant Invertebrate Fauna



# Appendix D Detailed Flora and Vegetation Assessment (RPS)

# Appendix E Banksia Woodland Community Assessment (Patch 1)

# Appendix F Banksia Woodland Community Assessment (Patch 5)

# Appendix G Phytophthora Dieback Occurrence Assessment

# Appendix H Terrestrial Fauna and Black Cockatoo Habitat Report

# **Appendix I Wetland Desktop Assessment Malaga to Ellenbrook Rail Line**



# Appendix J Inspection of Possible Black Cockatoo (*Calyptorhynchus Spp.*) Breeding Hollows

# Appendix K Bennett Brook Carter's Freshwater Mussel Targeted Survey

# Appendix L Preliminary Acid Sulfate Soil Investigation Part 2



# Appendix M Preliminary Site Investigation Part 2

# Appendix N Morley Ellenbrook Line (MEL) - Project Definition Plan (PDP) Flooding and Hydrology Report



# Appendix O Morley Ellenbrook Line (MEL) – Geomorphic Wetlands Impact Assessment



# Appendix P Strategic Level Hydrogeological Assessment - Malaga to Ellenbrook Rail Works (Part 2)

# **Appendix Q METRONET - Morley to Ellenbrook Line - Baseline Hydrology 2018 - 2019 Annual Report**

# Appendix R Desktop Aboriginal Heritage Analysis of Proposed Morley to Ellenbrook Railway Line

# Appendix S Noise and Vibration Assessment Report – Malaga to Ellenbrook

# Appendix T Offsets Strategy – Malaga to Ellenbrook Rail Works Proposal

# Appendix U Construction Environmental Management Plan



# Appendix V Noise and Vibration Management Plan

# Appendix W Acid Sulfate Soils Management Strategy

# Appendix X Threatened Ecological Communities Management Plan

# Appendix Y Greenhouse gas assessment