GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9427/1
Permit Holder:	Public Transport Authority of Western Australia
Duration of Permit:	From 14 February 2022 to 14 February 2032

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of removing level crossings along the Armadale passenger rail line.

2. Land on which clearing is to be done

Lot 67 on Plan 796, Beckenham, Cannington and East Cannington

Lot 320 on Deposited Plan 61379 (Crown Reserve 51572), Beckenham and Kenwick

Railway Parade Road reserve (PIN 11845387), Beckenham

Railway Parade Road reserve (PIN 11845388), Beckenham and East Cannington

Sevenoaks Street Road reserve (PIN 11845389), Beckenham and Cannington

Sevenoaks Street Road reserve (PIN 11845390), Beckenham

Lot 9003 on Deposited Plan 67766, Bentley, Cannington, Carlisle, East Victoria Park, Queens Park, and Welshpool

Sevenoaks Street Road reserve (PIN 11815541), Bentley and Cannington

Sevenoaks Street Road reserve (PIN 11815137), Bentley and Welshpool

Lot 70 on Plan 796, Cannington and East Cannington

Lot 4973 on Deposited Plan 36744 (Crown Reserve 47138), Cannington and East Cannington

Lot 9001 on Deposited Plan 67766, Cannington, East Cannington and Queens Park

Lot 9002 on Deposited Plan 67766, Cannington

Wharf Street Road reserve (PIN 11814846), Cannington and Queens Park

Sevenoaks Street Road reserve (PIN 11806820), Cannington

Sevenoaks Street Road reserve (PIN 11815801), Cannington

Unnamed Road reserve (PIN 11149143), Cannington

Unnamed Road reserve (PIN 11934034), Cannington

Unnamed Road reserve (PIN 11934037), Cannington

Roberts Road reserve (PIN 11809493), Carlisle and Lathlain

Rutland Avenue Road reserve (PIN 11809494), Carlisle

Railway Parade Road reserve (PIN 11815800), East Cannington and Queens Park
Railway Parade Road reserve (PIN 11817395), East Cannington
Unnamed Road reserve (PIN 1291025), East Cannington
Railway reserve (PIN 12486790), Lathlain and Victoria Park
Rutland Avenue Road reserve (PIN 11809497), Lathlain
Unnamed Road reserve (PIN 11816683), Lathlain
Railway Parade Road reserve (PIN 11814845), Queens Park
Railway Parade Road reserve (PIN 11815540), Queens Park and Welshpool
Railway reserve (PIN 11892242), Victoria Park
Bank Street Road reserve (PIN 11814788), Welshpool
Railway Parade Road reserve (PIN 11815140), Welshpool
Rutland Avenue Road reserve (PIN 11814786), Welshpool
Welshpool Road reserve (PIN 11815142), Welshpool

3. Clearing authorised

The permit holder must not clear more than 1.06 hectares of *native vegetation* within the area cross-hatched yellow in Figures 1-3 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 14 February 2027.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of clearing on any environmental value.

6. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

7. Planting – mitigation

(a) The permit holder must, within 24 months of the commencement of clearing authorised under this permit:

(i) undertake deliberate *planting* of *black cockatoo foraging trees* at a *suitable location* within five (5) kilometres of the application area, at ratio of 1:1 for each *black cockatoo foraging tree* cleared;

(ii) ensure the *planting* of *black cockatoo foraging trees* includes a combination of *Corymbia calophylla* (marri) and *Eucalyptus marginata* (jarrah);

(iii) ensure only *local provenance* propagating material is used for *planting* activities;

(iv) ensure *planting* is undertaken at the *optimal time*;

(v) undertake *weed* control and watering of seedlings, as required, for at least two years post *planting*.

(b) The permit holder must, within 24 months of *planting* the trees in accordance with condition 7(a)(i) of this permit:

(i) engage an *environmental specialist* to make a determination on the likelihood of survival of planted trees;

(ii) if the determination made by the *environmental specialist* under condition 7(b)(i) is that any planted trees will not survive, the permit holder must plant additional trees that will result in a ratio of 1:1 for each *black cockatoo foraging tree* cleared persisting at the *suitable location*;

(iii) where additional *planting* of trees is undertaken in accordance with condition 7(b)(ii), the permit holder must repeat the activities required under conditions 7(a)(ii)-(v) and 7(b)(i)-(ii) of this permit.

PART III - RECORD KEEPING AND REPORTING

8. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; and

No.	Relevant matter	Specifications
		(f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 6.
2.	In relation to *planting* pursuant to condition 7	(a) the size of the planted area; (b) the date(s) on which the *planting* was undertaken; (c) the boundaries of the area planted (recorded digitally as a shapefile); (d) a description of the *planting* activities undertaken pursuant to condition 7(a), including planted species composition and density, and actions taken to implement watering and *weed* control; (e) a copy of the *environmental specialist's* monitoring report and determination; and (f) a description of any remedial actions undertaken pursuant to conditions 7(b)(ii)-(iii), where the *environmental specialist* indicates that planted trees will not survive.

9. Reporting

(a) The permit holder must provide to the *CEO*, on or before 30 June of each calendar year, a written report containing:

(i) the records required to be kept under condition 8; and

(ii) records of activities done by the permit holder under this permit between 1 January and 31 December of the preceding calendar year.

(b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this permit has been undertaken, must be provided to the *CEO* on or before 30 June of each calendar year.

(c) The permit holder must provide to the CEO, no later than 90 calendar days prior to the expiry date of the permit, a written report of records required under condition 8, where these records have not already been provided under condition 9(a).

DEFINITIONS

In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
black cockatoo foraging tree	means native plant species known to be utilised by *black cockatoo species* for foraging and includes *Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah), *Eucalyptus spp.*, *Banksia* spp., *Allocasuarina* spp., and *Xanthorrhoea* spp.
black cockatoo species	means one or more of the following species: (a) *Calyptorhynchus lateriosis* (Carnaby's cockatoo);

Term	Definition
	(b) *Calyptorhynchus baudinii* (Baudin's cockatoo); and/or (c) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (2) years work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the CEO as a suitable environmental specialist.
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
planting	means the re-establishment of vegetation by creating soil conditions and *planting* seedlings of the desired species.
suitable location	means public open space managed by a local government authority or Crown reserve vested in the state.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

Jessica Burton
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

20 January 2022

Schedule 1

The boundary of the area authorised to be cleared is shown in the maps below (Figures 1-3).

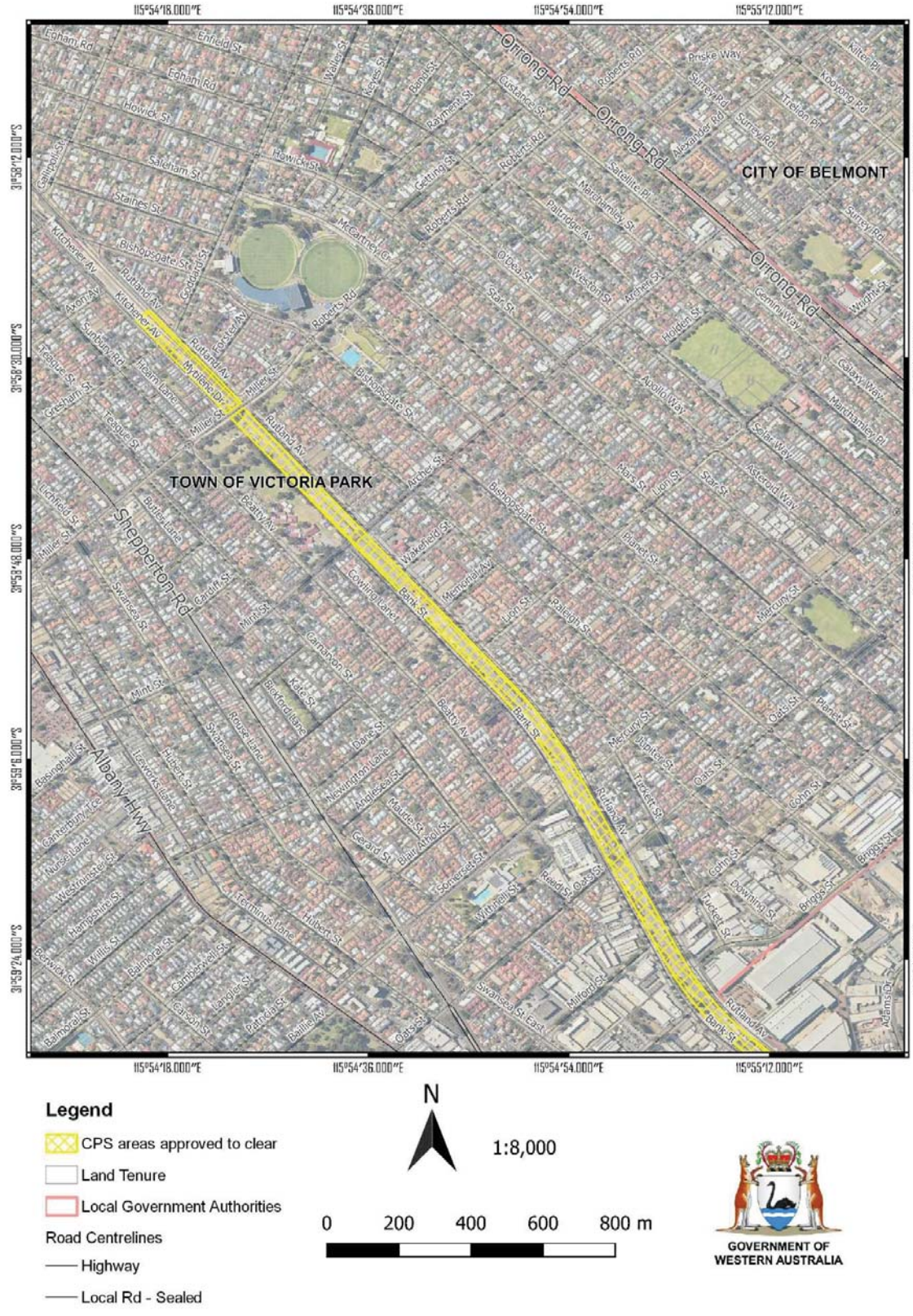


Figure 1: Map of the boundary of the area within which clearing may occur

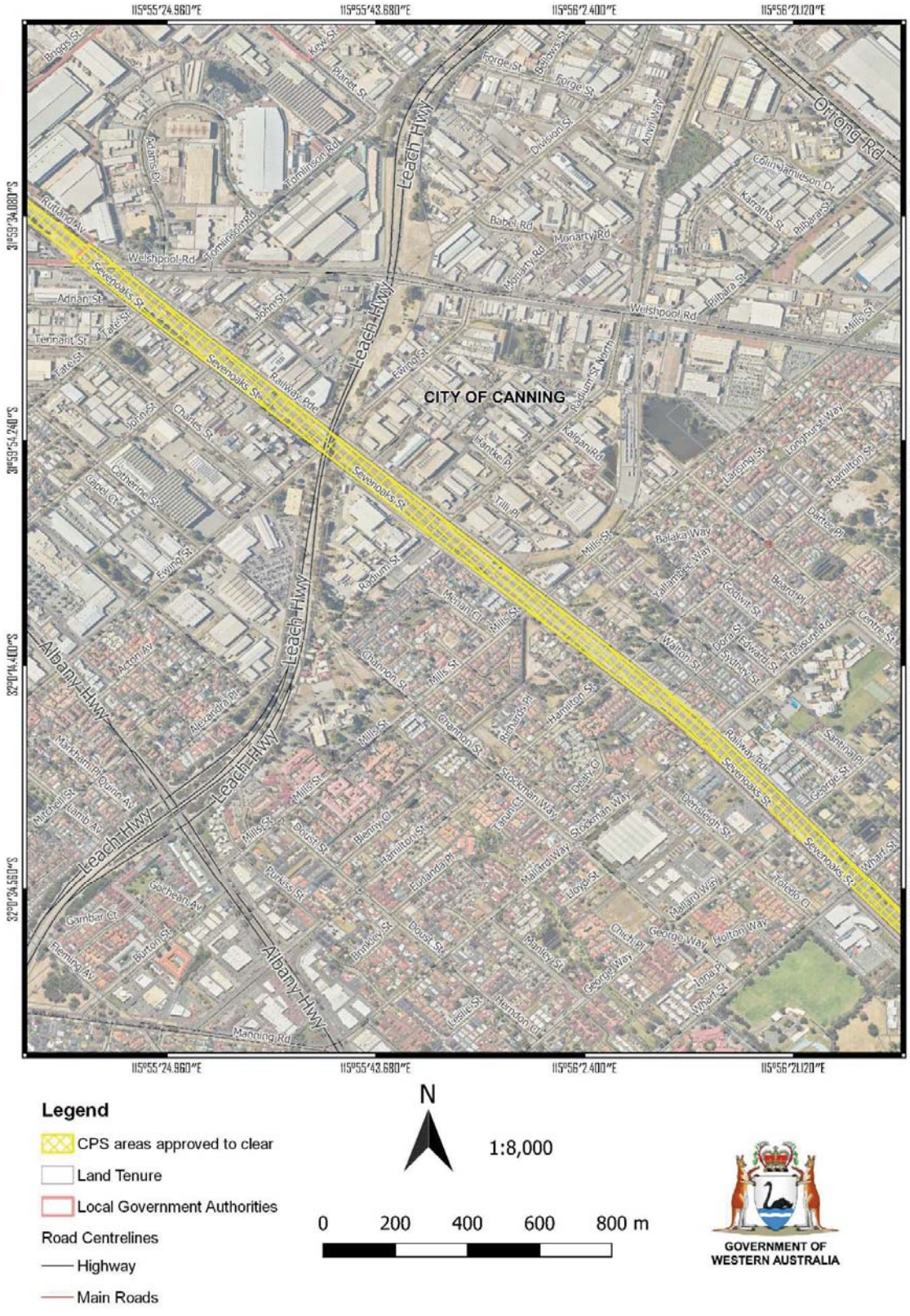


Figure 2: Map of the boundary of the area within which clearing may occur

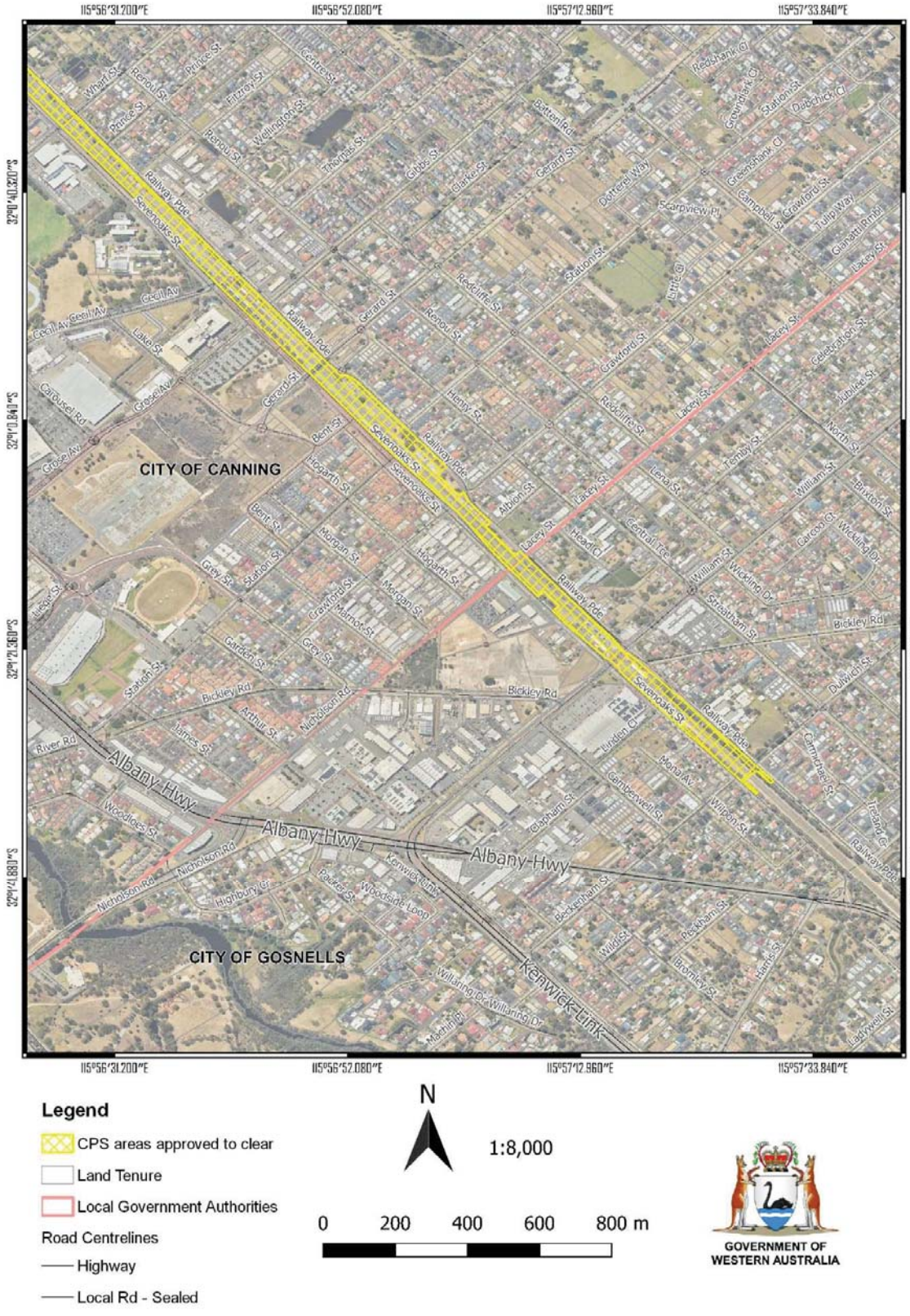


Figure 3: Map of the boundary of the area within which clearing may occur

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9427/1
Permit type:	Purpose permit
Applicant name:	Public Transport Authority of Western Australia
Application received:	13 September 2021
Application area:	1.06 hectares of native vegetation
Purpose of clearing:	Removing level crossings along the Armadale passenger rail line
Method of clearing:	Mechanical
Property:	Lot 67 on Plan 796 Lot 320 on Deposited Plan 61379 (Crown Reserve 51572) Railway Parade Road reserve (PIN 11845387) Railway Parade Road reserve (PIN 11845388) Sevenoaks Street Road reserve (PIN 11845389) Sevenoaks Street Road reserve (PIN 11845390) Lot 9003 on Deposited Plan 67766 Sevenoaks Street Road reserve (PIN 11815137) Sevenoaks Street Road reserve (PIN 11815541) Lot 70 on Plan 796 Lot 4973 on Deposited Plan 36744 (Crown Reserve 47138) Lot 9001 on Deposited Plan 67766 Lot 9002 on Deposited Plan 67766 Wharf Street Road reserve (PIN 11814846) Sevenoaks Street Road reserve (PIN 11806820) Sevenoaks Street Road reserve (PIN 11815801) Unnamed Road reserve (PIN 11149143) Unnamed Road reserve (PIN 11934034) Unnamed Road reserve (PIN 11934037) Roberts Road reserve (PIN 11809493) Rutland Avenue Road reserve (PIN 11809494) Railway Parade Road reserve (PIN 11815800) Railway Parade Road reserve (PIN 11817395) Unnamed Road reserve (PIN 1291025) Railway reserve (PIN 12486790)

	Rutland Avenue Road reserve (PIN 11809497) Unnamed Road reserve (PIN 11816683) Railway Parade Road reserve (PIN 11814845) Railway Parade Road reserve (PIN 11815540) Bank Street Road reserve (PIN 11814788) Railway Parade Road reserve (PIN 11815140) Rutland Avenue Road reserve (PIN 11814786) Welshpool Road reserve (PIN 11815142)
Location (LGA area/s):	City of Canning City of Gosnells Town of Victoria Park
Localities (suburb/s):	Beckenham Bentley Cannington Carlisle East Cannington East Victoria Park Kenwick Lathlain Queens Park Victoria Park Welshpool

1.2. Description of clearing activities

The vegetation proposed to be cleared comprises fragmented patches of remnant native vegetation within a single contiguous area along the Armadale passenger rail line, commencing north-west of Miller Street Bridge in Carlisle to south-east of Beckenham Station (see Figure 1, Section 1.5). The application proposes to clear native vegetation to facilitate the METRONET Inner Armadale Level Crossing Removal (IALXR) Project, which involves the removal of up to six level crossings along the Armadale passenger rail line.

1.3. Decision on application

Decision:	Granted
Decision date:	20 January 2022
Decision area:	1.06 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), the findings of biological surveys (see Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that the IALXR Project aims to deliver significant community benefit, including improved safety at rail line crossings, reduced congestion for road

users, improved capacity for rail operation, improved functionality, accessibility and connectivity of rail station infrastructure, and enhanced environmental values through landscaped public open space.

The assessment identified that the proposed clearing will result in:

- the loss of 1.06 hectares of primary and secondary foraging habitat for all three black cockatoo species (*Calyptorhynchus banksii naso, Calyptorhynchus baudinii,* and *Calyptorhynchus latirostris*),
- the loss of 0.63 hectares of native vegetation that is mapped within the extensively cleared Guildford Complex, and
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of nearby vegetation and its habitat values in an extensively cleared landscape.

In considering the location, extent and quality of foraging habitat proposed to be cleared, the Delegated Officer considered that the loss of 1.06 hectares of primary and secondary foraging habitat within the application area was unlikely to be significant for the ongoing maintenance of black cockatoo species but may result in impacts to populations of black cockatoos currently utilising the application area for foraging in the local area. Given the location, condition and fragmentation of the vegetation, the Delegated Officer also considered that the loss of 0.63 hectares of vegetation within the Guildford Complex was unlikely to significantly reduce the extent of this complex or be significant for its maintenance in the region. The Delegated Officer determined that impacts to local foraging habitat and an extensively cleared vegetation complex could be mitigated through a commitment to undertake replacement planting of suitable foraging habitat for black cockatoo species within five kilometres of the application area, as well as the applicant's assurance that landscaping of public open space will incorporative native species that are representative of local vegetation complexes.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on biological, conservation, or land and water resource values and can be minimised and managed to unlikely lead to an unacceptable risk to environmental values through permit conditioning.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise, and reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds, and
- undertake revegetation using suitable foraging habitat for black cockatoo species within five kilometres of the application area, at a ratio of 1:1 for each native foraging plant cleared.

1.5. Site maps

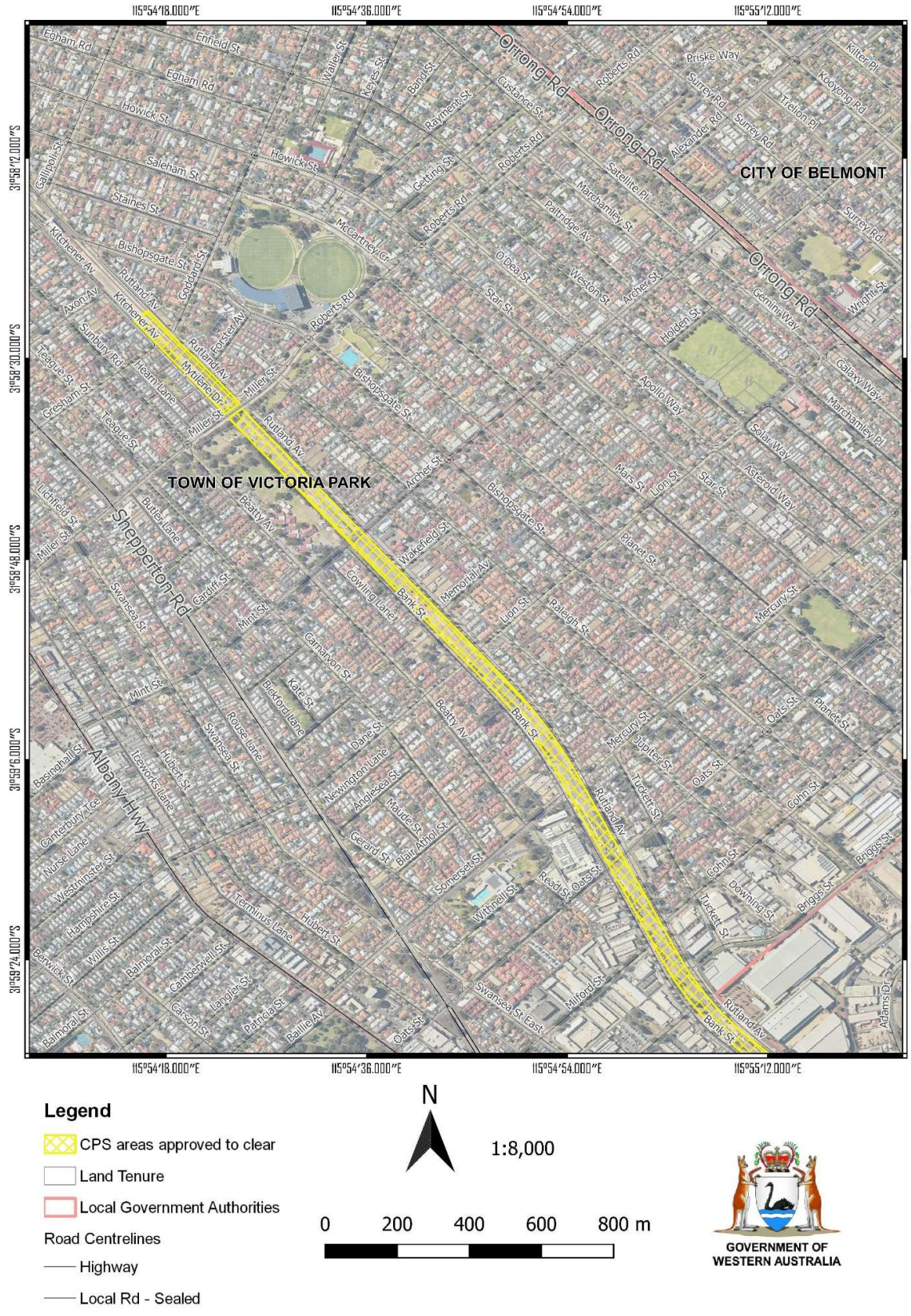


Figure 1: The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

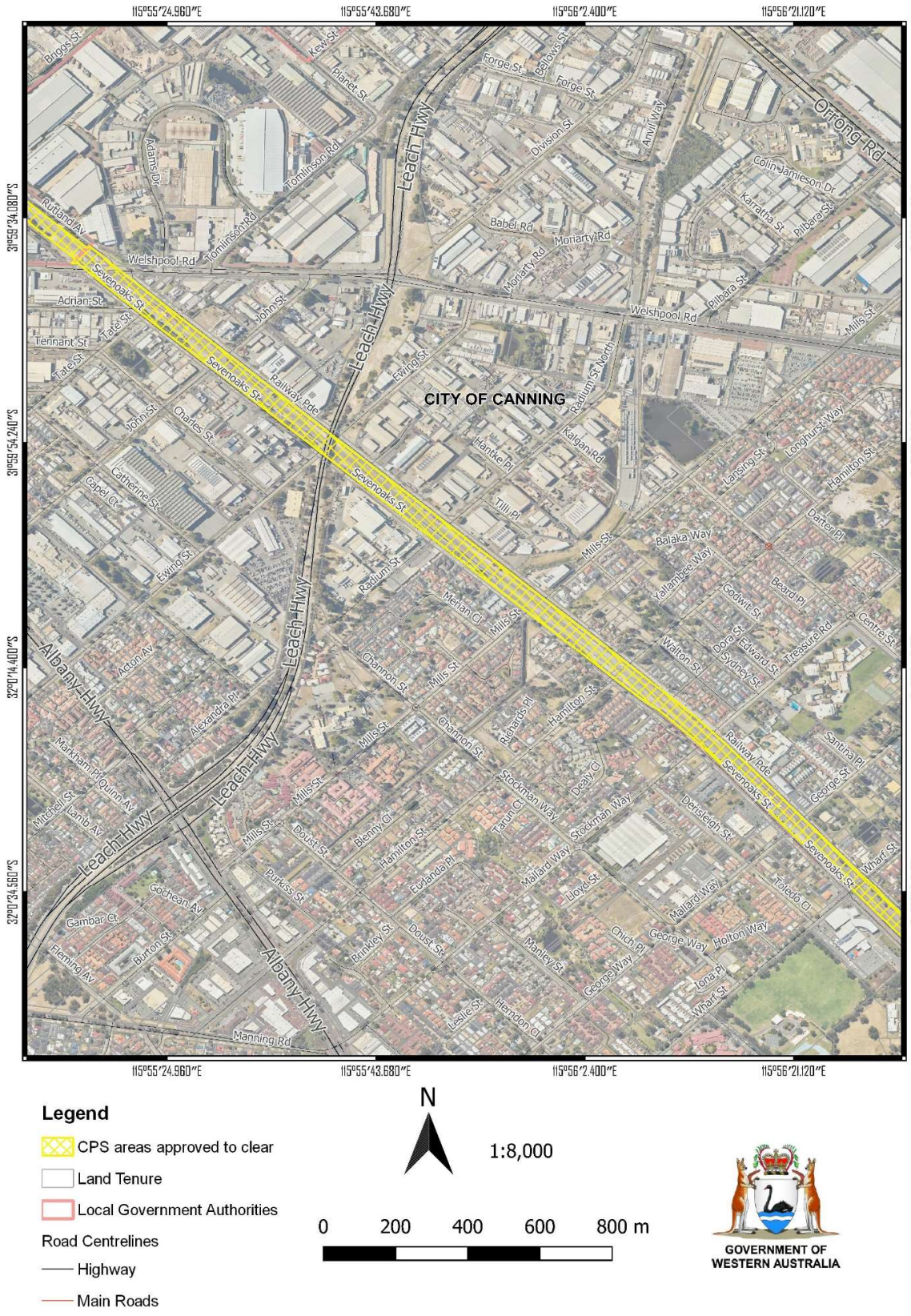


Figure 2: The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

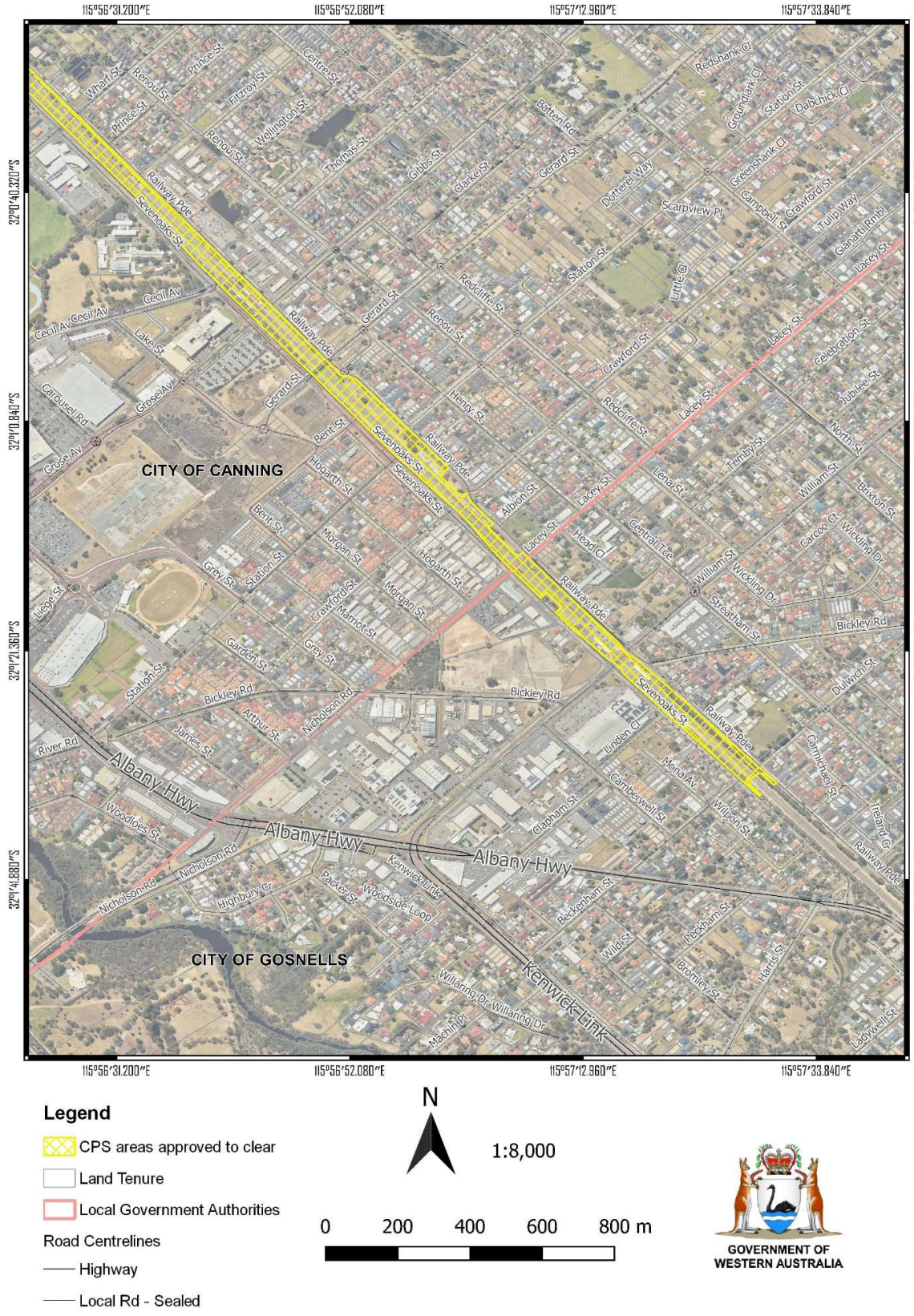


Figure 3: The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle,
- the principle of intergenerational equity,
- the polluter pays principle, and
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Contaminated Sites Act 2003* (WA) (CS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Rights in Water and Irrigation Act 1914* (WA) (RIWI Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Project design and planning

The applicant advised that the proposed clearing is required to facilitate the removal of level crossings along the Armadale passenger rail line at Mint Street, Oats Street, Welshpool Road, Hamilton Street, Wharf Street and William Street as part of the IALXR Project (PTA, 2021a). The applicant indicated that grade separation of the six level crossings will deliver significant community benefit, including improved safety for people and vehicles crossing the rail line, reduced congestion for road users, improved capacity for rail operation, improved functionality of rail station infrastructure and unlocking land within the rail reserve for public open space, and improved accessibility and connectivity (PTA, 2021a).

Supporting documentation was submitted by the applicant, demonstrating that concept planning for the project investigated various options for the removal of the level crossings including rail over road, road over rail, or a combination of both options (PTA, 2021a). The applicant advised that the preferred option is an elevated rail line, as this can be constructed within the existing rail corridor footprint, reducing disturbance to adjacent infrastructure, and minimising the total clearing of native vegetation required (PTA, 2021a). Accordingly, the applicant advised that clearing of native vegetation has been minimised to only the extent required to facilitate the construction of:

- An elevated, continuous viaduct structure of approximately 1.6 kilometres in length, from west of the existing Carlisle Station over Mint Street and Oats Street, returning at grade level on the eastern side of the existing Oats Street platform,
- A rail bridge over Welshpool Road,
- An elevated, continuous viaduct structure of approximately 900 metres in length, from west of Hamilton Street, returning to grade level south-east of Wharf Street, and
- A potential future 500-metre viaduct structure to replace the William Street level crossing (PTA, 2021a).

During clearing

The applicant advised that, as the preferred Alliance Partner for construction has only recently been determined, the detailed project design, identification of construction requirements, and selection of construction methods are pending (PTA, 2021b). However, the applicant has advised that a component of the contract with the Alliance Partner is a Scope of Works and Technical Criteria (SWTC), which establishes essential project requirements that must be met (PTA, 2021b). Embedded within the SWTC is the requirement for the Alliance Partner to avoid and minimise the clearing of vegetation, including a commitment to retain mature trees, where possible (PTA, 2021b). The applicant has indicated that opportunities to avoid clearing of established native vegetation will be investigated during detailed project design and on-ground during works as part of the SWTC (PTA, 2021a).

The applicant has also indicated that, as part of the SWTC, the Alliance Partner will be required to liaise with the Kararakin Black Cockatoo Conservation Centre (Kaarakin), for the provision of cleared material including tree branches, tree seeds/nut and wood chips (PTA, 2021b). The applicant has advised that suitable materials will be salvaged and donated to Kaarakin for use in the rehabilitation of injured black cockatoos (PTA, 2021b). While the Delegated Officer does not consider this as a measure to avoid or minimise the impacts of the proposed clearing, the sentiment of recycling cleared material for rehabilitation is acknowledged as a positive outcome post-clearing.

Post-clearing

The applicant has advised that the elevated viaduct structures will convert approximately 1.76 kilometres of the existing rail corridor into approximately 6 hectares of future public open space (POS) (PTA, 2021a). The final plans for landscaping of POS areas will be developed by the applicant and the Alliance Partner in consultation with each local government authority (LGA), ensuring that local requirements are met (PTA, 2021b). However, the applicant has advised that landscaping of POS areas will involve the planting of native species and will incorporate species that provide black cockatoo foraging habitat and represent local vegetation complexes, where possible (PTA, 2021b). Accordingly, the SWTC requires landscaping of the POS area to:

- Increase the total number of trees within the project area and offset the number of mature trees lost through new tree plantings, and
- Ensure known black cockatoo foraging species are not planted within 10 metres of rail infrastructure or highway carriageways to reduce the risk of vehicle strike, but are used elsewhere in POS areas (PTA, 2021b).

The applicant has advised that the aim for landscaping is to establish locally native species in POS areas and leave a net improvement in local environmental values (PTA, 2021b).

In response to the Department's assessment of impacts on biological values (see Section 3.2.1), the applicant has committed to undertake replacement planting at a ratio of 1:1 for each black cockatoo foraging plant cleared under the proposal (PTA, 2021b). The applicant has committed to undertaking this planting in the POS areas or in reserves within a five-kilometre radius of the application area to mitigate the impacts of the proposal on local foraging habitat for black cockatoo species (PTA, 2021b).

In considering the above, the Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix C) identified that the impacts of the proposed clearing present a risk to biological values (fauna) and significant remnant vegetation. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment

Noting the site characteristics and habitat preferences of the conservation significant fauna species recorded in the local area (see Appendix A), the application area was considered to contain suitable habitat for the following species:

- *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo) (listed as Vulnerable under the BC Act and
- EPBC Act),
- *Calyptorhynchus baudinii* (Baudin's cockatoo) (listed as Endangered under the BC Act and EPBC Act),
- *Calyptorhynchus latirostris* (Carnaby's cockatoo) (listed as Endangered under the BC Act and EPBC Act), and
- *Falco peregrinus* (peregrine falcon) (listed as other specially protected fauna by DBCA).

This was supported by the findings of the *'Fauna Habitat Assessment, Armadale Train Line'*, which included a reconnaissance fauna survey and targeted black cockatoo habitat assessment within the application area (Harewood, 2020).

It is acknowledged that the reconnaissance fauna survey identified potentially suitable habitat for three additional species within the survey area (Harewood, 2020). However, it should be noted that the survey area spanned beyond the application area for CPS 9427/1 and included all native and non-native vegetation along the Armadale train line

from Perth to south of Armadale station (Harewood, 2020). Therefore, while suitable habitat may be present in the greater survey area, it is unlikely that suitable habitat for these species is present within the application area itself.

Two of the additional species, *Westralunio carteri* (Carter's freshwater mussel) (listed as Vulnerable under the BC Act and EPBC Act) and *Hydromys chrysogaster* (rakali) (listed as Priority 4 by DBCA), are associated with permanent freshwater aquatic habitats (DWER, 2022; TSSC, 2018). As the application area does not intersect any permanent, natural watercourses, it is not considered to provide suitable habitat for these species. The other additional species, *Isoodon fusciventer* (quenda) (listed as Priority 4 by DBCA), is associated with forest or woodlands near watercourses, where understorey consists of dense scrub and leaf litter is abundant (DEC, 2012). The fauna assessment noted that suitable habitat for quenda may be present in low, dense vegetation adjacent to the Brixton Street Wetlands (Harewood, 2020), which is approximately one kilometre south of the application area. Given the application area comprises small, isolated remnants of *Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah), and *Xanthorrhoea preissii* (grass tree) over exotic species in Completely Degraded (Keighery, 1994) condition that lacks native understorey species and connectivity to larger remnants of suitable habitat in the local area, it is not considered likely to contain significant habitat for quenda or any other ground-dwelling fauna species.

Black cockatoo species

Breeding habitat

Baudin's cockatoo, Carnaby's cockatoo and the forest red-tailed black cockatoo, collectively known as black cockatoo species, are known to nest in hollows of live and dead trees, including marri, jarrah, karri (*Eucalyptus diversicolor*), wandoo (*Eucalyptus wandoo*), tuart (*Eucalyptus gomocephala*), flooded gum (*Eucalyptus rudis*), and other *Eucalyptus* spp. (Commonwealth of Australia, 2012). 'Breeding habitat' for black cockatoos includes trees of these species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow, where suitable DBH for nest hollows is 500 millimetres for most tree species (Commonwealth of Australia, 2012). While breeding, black cockatoos also generally forage within a 6-to-12- kilometre radius of their nesting site (Commonwealth of Australia, 2012). According to available datasets, mapped potential black cockatoo foraging habitat is recorded within a 12-kilometre radius of the application area, including partially within the application area itself, making it a suitable location for breeding if appropriate hollows are present. The application area is located within the modelled breeding range for the forest red-tailed black cockatoo but is well outside of the modelled breeding range for Baudin's cockatoo and is not considered likely to comprise potential breeding habitat for this species. While the application area is outside of the modelled breeding range for Carnaby's cockatoo, the modelled breeding range for this species is less than two kilometres from the application area and potential breeding sites are recorded within a 10-kilometre radius, according to available databases. Therefore, the application area is considered to comprise potential breeding habitat for Carnaby's cockatoo.

The targeted black cockatoo habitat assessment identified 25 native habitat trees of suitable DBH to provide breeding habitat within the application area, all of which were marri (Harewood, 2020). Of these habitat trees, two marri trees were identified to contain hollows (Harewood, 2020). One tree contained a small hollow that was occupied by bees, which had insufficient entrance size and internal dimensions to be suitable for use for breeding by black cockatoo species (Harewood, 2020). The other tree contained two small to medium-sized hollows that were unoccupied, but exhibited chew marks from small parrots, assumed to be that of *Eolophus roseicapilla* (galah) (Harewood, 2020). However, the entrance size of the hollow was assessed as being too small for a black cockatoo to utilise (Harewood, 2020). It is noted that an additional 28 introduced *Eucalyptus* sp. of suitable DBH for breeding were identified within the application area (Harewood, 2020), but that these species do not meet the definition of native vegetation for the purposes of Part V Division 2 of the EP Act and are therefore, outside of the scope of this clearing permit to assess. However, it should be noted that no non-native habitat trees within the application area were identified to contain hollows of any size (Harewood, 2020). Given the above, the application area is not considered to contain any suitable breeding hollows for black cockatoo species and is unlikely to comprise significant breeding habitat for black cockatoo species, at present. Therefore, the proposed clearing is not considered likely to significantly impact breeding by black cockatoo species in the local area.

Roosting habitat

It is recognised that the habitat trees within the application area may also represent suitable roosting habitat for black cockatoo species. According to available databases, there are 99 documented roost sites for black cockatoo species in the local area, with the closest confirmed active roost site being approximately 250 metres from the application area (DBCA, 2007-). However, no evidence of roosting by black cockatoo species was observed within the application area during the black cockatoo habitat assessment (Harewood, 2020). Further, roosting is typically noted to occur within suitable trees close to an important water source and within an area of quality foraging habitat (Commonwealth of Australia, 2012). As the application area does not transect any permanent watercourses and contains sparsely distributed foraging habitat (as discussed below) adjacent to road and railway infrastructure, the proposed clearing is not considered likely to result in the loss of significant roosting habitat for any black cockatoo species.

Foraging habitat

Black cockatoo species are noted to forage on a range of plant species, with the primary foraging resources varying between species (Commonwealth of Australia, 2012). Carnaby's cockatoos forage on the seeds, nuts, and flowers of a variety of plants, including Proteaceous species *(Banksia* spp., *Hakea* spp., and *Grevillea* spp.), as well as *Allocasuarina* and *Eucalyptus* species, marri and a range of introduced species (Valentine and Stock, 2008). On the Swan Coastal Plain, it is noted that *Banksia* species (predominantly *Banksia attenuata*, *Banksia menziesii* and *Banksia sessilis*) are the most important natural food source for Carnaby's cockatoo, followed by marri (Groom, et al., 2014). Forest red-tailed black cockatoos feed predominantly on the seeds of marri and jarrah, which comprise approximately 90 per cent of their diet (DEC, 2008). Baudin's cockatoos primarily feed on the seeds of marri, but may also forage on the seeds of jarrah and Proteaceous species (DEC, 2008). Given the application area contains marri and jarrah and occurs within the predicted occurrence range for all three black cockatoo species, the application area is likely to provide suitable foraging habitat for black cockatoos.

The targeted black cockatoo habitat assessment identified that native primary foraging habitat within the application area is limited to scattered stands or isolated specimens of marri and jarrah trees (Harewood, 2020). Native secondary foraging habitat is also present within the application area but is limited to individual grass trees which may provide occasional forage for black cockatoo species but are likely to represent a small proportion of any one bird's diet overall (Harewood, 2020). It is acknowledged that the targeted black cockatoo habitat assessment identified planted and introduced species within the clearing footprint that may also provide foraging habitat for black cockatoo species (Harewood, 2020). However, these species do not meet the definition of native vegetation for the purposes of Part V Division 2 of the EP Act and are therefore, outside of the scope of this clearing permit to assess.

The targeted black cockatoo habitat assessment noted that, as many foraging trees are represented by scattered and isolated specimens interspersed amongst non-favoured and/or non-native species, it is difficult to quantify the spatial extent of foraging habitat within the greater survey area (Harewood, 2020). Noting that spatial extent has not been quantified, but that the targeted black cockatoo habitat assessment recorded primary and secondary foraging species in all areas of native vegetation within the clearing footprint, the application area is considered to contain 1.06 hectares of foraging habitat for black cockatoo species. Based on survey mapping of the vegetation types within the application area, this is assumed to include approximately 0.89 hectares of primary foraging habitat and 0.17 hectares of secondary foraging habitat. The targeted black cockatoo habitat assessment also identified evidence of foraging by all three species of black cockatoo within the greater survey area (see Table 1 below), primarily in the form of chewed marri fruits (Harewood, 2020). It is unclear from the targeted black cockatoo habitat assessment report exactly where within the greater survey envelope this evidence was identified. Therefore, it has been assumed that the application area may currently be utilised for foraging by black cockatoo species.

Table 1. Examples of foraging evidence within the Perth to Armadale Rail Line survey area (Harewood, 2020).

Foraging Evidence Description	Example Image
Marri fruits – foraging activity attributed to the Forest Red-tailed Black Cockatoo.	
Marri fruits – foraging activity attributed to the Carnaby's Black Cockatoo.	
Marri fruits – foraging activity attributed to the Baudin's Black Cockatoo.	

Critical habitat for Carnaby's cockatoo includes any habitat that provides for feeding, watering, regular night roosting and potential for breeding (DPAW, 2013). As the application area includes 1.06 hectares of currently utilised foraging habitat and potential roosting trees, it may be considered critical habitat for Carnaby's cockatoo. However, it is noted that the application area does not include *Banksia* species and therefore, may not represent a primary foraging resource for Carnaby's cockatoo on the Swan Coastal Plain. In regard to the forest red-tailed black cockatoo and Baudin's cockatoo, critical habitat for these species is defined as all marri, karri and jarrah forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 millimetres of annual average rainfall (DEC, 2008). As the application area includes remnant marri and jarrah woodland on the Swan Coastal Plain and evidence of foraging by both species was observed during the targeted black cockatoo survey, the application area may also meet the definition of critical habitat for Baudin's cockatoo and the forest red-tailed black cockatoo. The referral guidelines for black cockatoo species also acknowledges that foraging habitat within 12 kilometres of a breeding site and within six kilometres of a night roost are of particular importance for black cockatoo species (Commonwealth of Australia, 2012). According to available databases, there are 33 documented roost sites for black cockatoo species within six kilometres of the application area, meaning that the application area may support foraging by roosting individuals. The closest documented breeding site for either Carnaby's cockatoo or Baudin's cockatoo is approximately seven kilometres from the application area, within the range for breeding individuals to be foraging. However, the closest documented breeding site for the forest red-tailed black cockatoo is approximately 29 kilometres from the application area.

While the application area may meet the definition of critical habitat for black cockatoo species and occur within the range to support foraging by roosting and breeding individuals, it is acknowledged that foraging habitat within the application area is limited to individual specimens or isolated patches of foraging trees adjacent to existing road and railway infrastructure. It is also noted that the proximity of foraging habitat within the application area to existing rail infrastructure may limit utilisation of the vegetation during periods of high disturbance from noise, dust and wind exposure, and represents a risk of vehicle strike to foraging individuals. According to available databases, approximately 6600 hectares of mapped foraging habitat for black cockatoo species exists within the local area, of which approximately 2360 hectares occurs within larger remnants of secure conservation estate, including Canning River Regional Park and Korung National Park. The application area represents approximately 0.016 per cent of this mapped foraging habitat, where primary foraging habitat within the application area represents approximately 0.013 per cent of all mapped foraging habitat in the local area. In considering the above and the location, extent and quality of foraging habitat proposed to be cleared, it is not considered likely that the 1.06 hectares of primary and secondary foraging habitat within the application area is significant for the ongoing maintenance of black cockatoo species.

However, while the loss of the foraging habitat within the application area itself may not represent a significant impact to the continuation of black cockatoo species, it is acknowledged that the proposed clearing will result in impacts to the black cockatoo populations currently utilising the application area for local foraging. It is also acknowledged that the application area provides foraging habitat for all three black cockatoo species within an area that has been extensively cleared (see Section 3.2.2) and that the ongoing loss of foraging habitat on the Swan Coastal Plain has been identified as a significant risk to black cockatoo species, particularly to Carnaby's cockatoo (EPA, 2019; DPAW, 2012). To mitigate impacts to local foraging habitat for black cockatoo species on the extensively cleared Swan Coastal Plain, the applicant has committed to undertaking replacement planting at a ratio of at least 1:1 for each native foraging plant cleared under the proposal (PTA, 2021b). The applicant has advised that planting will include the planting of local provenance marri and jarrah in reclaimed POS areas or in reserves within a five-kilometre radius of the application area, to ensure no net loss of foraging plants in the local area will result from the proposal (PTA, 2021b). The applicant has also advised that foraging plants will be planted at least 10 metres from rail infrastructure and highway carriageways, to limit the risk to individuals foraging within the area (PTA, 2021b).

Peregrine falcon

The peregrine falcon typically nests on rocky ledges in tall, vertical cliff faces and gorges, or in tall trees associated with drainage lines, and can hunt in a range of habitat types including timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings (Australian Museum, 2021). The reconnaissance fauna survey identified that the peregrine falcon may occur infrequently when foraging in air space over the survey area, but that breeding or long-term occupation of the application area is unlikely (Harewood, 2020). Noting that the peregrine falcon is a highly mobile species with a large home range that does not rely on specialist niche habitats, the species is likely to be transient in the application area only and it is unlikely that the application area represents significant habitat for the species. Further, noting that the application area includes small, isolated, and disturbed remnants of native vegetation adjacent to existing infrastructure in the Perth Metropolitan Area and that larger remnants of native vegetation exist in the vicinity (e.g., Canning River Regional Park), it is unlikely that the peregrine falcon would be reliant on the application area for foraging in the local area.

Ecological linkage
Although the application area consists of isolated, fragmented and sparsely distributed shrubland and woodland that provide limited linkage values to ground-dwelling fauna, it is acknowledged that patches of vegetation within an extensively cleared landscape may still provide linkage values for avian fauna moving through the local area, including black cockatoo species. However, the application area represents approximately 0.01 per cent of all mapped remnant vegetation in the local area and approximately 7285 hectares of remnant vegetation persists in the local area, according to available databases. It is also acknowledged that larger remnants of native vegetation in secure conservation estate also persist in the local area, including Canning River Regional Park and the Greater Brixton Street Wetlands, and will continue to provide linkage values in the vicinity of the application area. Given the above, it is not considered likely that the proposed clearing will significantly reduce ecological linkages in the local area or result in significant impacts to the movement of avian fauna through the landscape.

Conclusion
Based on the above assessment, the proposed clearing will result in the loss of 1.06 hectares of primary and secondary foraging habitat for all three black cockatoo species. For the reasons set out above, it is considered that the impacts of the proposed clearing on local black cockatoo foraging habitat can be mitigated through permit conditioning requiring the applicant to undertake revegetation within five kilometres of the application area at a ratio of 1:1 for each native foraging plant cleared under the proposal. After consideration of the applicant's mitigation measures and permit conditioning, the Delegated Officer determined that the impacts of the proposed clearing on black cockatoo foraging habitat does not constitute a significant residual impact.

The applicant may have notification responsibilities under the EPBC Act for impacts to Baudin's black cockatoo, Carnaby's cockatoo, and forest red-tailed black cockatoo and their habitats, as set out in the EPBC Act referral guidelines for these species. The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Revegetation – mitigation, which requires the revegetation of suitable foraging habitat for black cockatoo species within five kilometres of the application area, at a ratio of 1:1 for each native foraging plant cleared.

3.2.2. Significant remnant vegetation - Clearing Principle (e)

Assessment
The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). Noting that the current vegetation extent for the mapped Swan Coastal Plain vegetation complexes and vegetation extent within the local area fall below the 30 per cent threshold (see Appendix B.2), the application area is considered to be a remnant within an extensively cleared landscape.

However, the Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region to be a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008). The current vegetation extent for the Swan Coastal Plain IBRA Bioregion, the Bassendean Complex-Central and South, the Cannington Complex, and the local area are all above the 10 per cent threshold for constrained areas (see Appendix B.2). However, the current vegetation extent for the Guildford Complex falls below the 10 per cent threshold and is considered to be extensively cleared within the Perth Metropolitan Region constrained area (see Appendix B.2).

While it is acknowledged that native vegetation within the application area is limited to small, isolated remnants of marri and jarrah trees, these canopy species may be representative of the Guildford Complex. Noting that the pre-European vegetation extent of the Guildford Complex has been significantly reduced and that only 0.32 per cent of remaining vegetation mapped within this complex lies within conservation estate, occurrences of intact vegetation that is representative of the Guildford Complex may be significant for its maintenance. However, it is noted that flora and vegetation surveys indicate that the vegetation within the application area is too degraded to be considered truly representative of any vegetation complex (Aurora Environmental, 2020). It is also acknowledged that the total size of the application area that is mapped within the Guildford Complex is 0.63 hectares, which represents approximately 0.014 per cent of all vegetation remaining within the Guildford Complex. Given the above, the lack of representative mid-and understorey species, the fragmentation and isolation of the vegetation by adjacent road and rail infrastructure, and the Completely Degraded (Keighery, 1994) condition of the vegetation within the application area, it is unlikely that the application area is significant for the ongoing maintenance of the Guildford Complex or that the proposed clearing will significantly reduce the pre-European extent of the complex.

Although the application area is likely to provide foraging habitat for black cockatoo species, it is acknowledged that the foraging habitat within the application area is unlikely to be significant for the ongoing maintenance of these species (see Section 3.2.1) and that the application area is not representative of locally or regionally significant vegetation communities. Further, the proposed clearing area comprises approximately 0.01 per cent of all mapped remnant vegetation in the local area and contains fragmented and isolated native vegetation in Completely Degraded (Keighery, 1994) condition, within the Armadale passenger rail line footprint, which is likely to be subject to ongoing disturbance and degradation. It is also noted that the applicant has committed to undertaking mitigation revegetation of suitable foraging habitat for black cockatoo species within five kilometres of the application area, at a ratio of 1:1 for each native foraging plant cleared (see Section 3.2.1). The applicant has advised that the revegetation of black cockatoo foraging habitat and the landscaping of future POS areas will also incorporative native canopy species that are representative of local vegetation complexes including the Guildford Complex, with a core objective of landscaping being to enhance local environmental values and native species cover (PTA, 2021b). Noting the above, the application area is not considered to be a significant remnant of native vegetation and the proposed clearing is not considered likely to have a significant impact on vegetation extent within the extensively cleared local area.

However, given the application area is weed-infested, it is acknowledged that the proposed clearing may cause degradation of nearby remnant native vegetation within the extensively cleared landscape by facilitating the spread of weeds and dieback, including into the landscaped and revegetated land conditioned under this permit. A weed and dieback management condition is considered to minimise this risk, and it is not considered likely that the proposed clearing will have a significant impact on nearby significant remnant vegetation.

Conclusion
Based on the above assessment, the application area is not considered to be significant as a remnant of native vegetation within an area that has been extensively cleared. However, the proposed clearing has the potential to facilitate the spread of weeds and dieback into significant remnant vegetation in the local area.

It is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable by taking steps to minimise the risk of the introduction and spread of weeds and dieback and does not constitute a significant residual impact.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Dieback and weed control, which ensures protocols are put in place to limit the introduction and transportation of dieback- and weed-affected materials.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on DWER's website on 24 September 2021, inviting submissions from the public within a 21-day period. No submissions were received in relation to this application.

The Town of Victoria Park (the Town) advised DWER that limited native vegetation, as defined in the EP Act, exists within the application area on Town land and expressed no concerns regarding the proposed clearing of native vegetation (Town of Victoria Park, 2021). However, the Town expressed concerns over the removal of deliberately planted mature trees on Town land, noting that these play an important role in the Town's biodiversity and environmental sustainability, while having significant benefits to local amenity (Town of Victoria Park, 2021). The Town noted that this deliberately planted vegetation does not meet the definition of native vegetation for the purposes of Part V Division 2 of the EP Act and therefore, is not assessed or approved under the clearing permit application (Town of Victoria Park, 2021). The Town indicated that the removal of non-native mature trees would need approval from the Town (Town of Victoria Park, 2021). The applicant was informed of the Town's comments and advised that they would continue discussions with the Town regarding non-native tree removal requirements for the proposal once a detailed project design and construction requirements had been confirmed with the preferred Alliance Partner (PTA, 2021a). The applicant advised that vegetation removal would not commence without prior consultation and that the Town would also be consulted to provide input on post-clearing landscaping requirements within Victoria Park (PTA, 2021a).

The City of Canning and City of Gosnells were invited to provide comments on the clearing permit application. To date, no response has been received from either City. However, supporting documentation provided by the applicant indicates that both the City of Canning and the City of Gosnells provided written authorisation for the clearing permit application to include the land parcels under their management (PTA, 2021a).

Supporting documentation provided by the applicant indicates that dewatering may be required as part of the proposal (PTA, 2021a). As the application area is located within the Perth Groundwater Area, a proclaimed

groundwater resource, dewatering may require a license to take water under the RIWI Act. The applicant advised that, as the preferred Alliance Partner for construction has only recently been determined, the detailed project design including the location where dewatering will occur, the depth of dewatering, and the duration are unknown (PTA, 2021b). The applicant advised that the need for dewatering will be reviewed once the project enters detailed design (PTA, 2021b). The applicant advised that, should dewatering be required during the construction phase of the proposal, the Alliance Partner will obtain all relevant approvals under the RIWI Act and will prepare a Dewatering Management Plan, if required, prior to commencing works (PTA, 2021b).

DWER's Contaminated Sites Branch (CS) advised that land within Lot 9003 on Deposited Plan 67766 was classified as *'contaminated - remediation required'* under the CS Act in May 2007, following the detection of hydrocarbons in groundwater beneath the site which had migrated from a former service station at 166 Rutland Avenue, Carlisle (DWER, 2021). CS advised that the remediation of hydrocarbon-impacted soil at the former service station has been completed, however, investigations characterising groundwater impacts are ongoing (DWER, 2021). CS advised that the proposed clearing of native vegetation is unlikely to disturb the identified contamination, but that any dewatering in the vicinity of the site should include a Dewatering Management Plan with measures for the management of potentially contaminated groundwater (DWER, 2021). The applicant advised that groundwater monitoring wells had been installed within the application area as part of detailed site investigations, which would be monitored to determine existing groundwater quality and levels and would inform the requirements of a Dewatering Management Plan, should one be required (PTA, 2021b). The applicant advised that the management of contaminated sites would occur in line with the requirements of the CS Act and DWER's Contaminated Sites Guidelines (PTA, 2021b).

One Aboriginal site of significance, the Hamilton Crossing, has been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
The applicant provided the following additional supporting information on 14 December 2021: • Details of additional avoidance, minimisation, and mitigation measures, including a commitment to replacement planting, and • Clarification of other matters, including dewatering and contamination management (PTA, 2021b).	The additional supporting information provided was considered as follows: • The avoidance, mitigation, and management measures proposed by the applicant were considered in *Avoidance and mitigation measures* (see Section 3.1), and • The clarification of other matters provided by the applicant were considered in *Relevant planning instruments and other matters* (see Section 3.3).

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared comprises 16 isolated patches of native vegetation in the intensive land use zone of Western Australia, varying in size from approximately 0.002 to 0.282 hectares. The application area runs adjacent to the existing Armadale passenger rail line and associated infrastructure along Sevenoaks Street and Railway Parade. The proposed clearing area comprises small, isolated remnants of native vegetation in a highly cleared landscape within the Perth Metropolitan Area. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 16.95 per cent of the original native vegetation cover (see Appendix B.2).
Ecological linkage	The application area does not intersect any formally mapped ecological linkages. Although the vegetation may be providing some connectivity in an extensively cleared landscape, it is noted that the application area is surrounded by historically cleared residential and industrial land and does not provide connectivity to larger remnants of native vegetation in the local area. Given the application area consists of fragmented and isolated patches of remnant native vegetation surrounded by infrastructure, it is not considered to be contributing significantly to the values of the nearby mapped linkages or to any formal or informal ecological linkages in the local area.
Conservation areas	The closest conservation areas are Canning River Regional Park, located approximately 1.3 kilometres south-west of the application area, and the Greater Brixton Street Wetlands within Bush Forever Site 387, located approximately 1.3 kilometres south-east of the application area. The nearest conservation areas are separated from the application area by historically cleared land and established infrastructure.
Vegetation description	Flora and vegetation assessments of the Oats Street level crossing site in 2018 and of the entire Armadale passenger rail line in 2020 were undertaken by PGV Environmental on behalf of Aurora Environmental (Aurora Environmental, 2020; PGV Environmental, 2020; PGV Environmental, 2019). These assessments indicate the vegetation within the proposed clearing area consists of scattered native vegetation interspersed with non-native or planted vegetation, described by location: • Oats Street, East Victoria Park to Welshpool Road, Welshpool - *Xanthorrhoea preissii,* Exotic Trees and Shrubs intermixed with *Xanthorrhoea preissii, Eucalyptus marginata / Corymbia calophylla* intermixed with Exotic Trees and

Characteristic	Details
	Shrubs. This area also contains other potentially local native species such as *Adenanthos cygnorum*, *Jacksonia furcellata, Xanthorrhoea preissii, Gompholobium tomentosum, Scholtzia involucrata* and *Stirlingia latifolia.* It is unclear if these specimens were planted or have naturally regenerated, • Gerard Street, Cannington to William Street, Beckenham – scattered *Corymbia calophylla and Corymbia calophylla* intermixed with Exotic Trees and Shrubs, and • South of William Street, Beckenham – a line of dense remnant *Corymbia calophylla* over cleared or maintained grass understorey with planted Grevillea shrubs (Aurora Environmental, 2020; PGV Environmental, 2020; PGV Environmental, 2019). The full survey mapping is available in Appendix E. This is broadly consistent with the mapped Swan Coastal Plain vegetation types: • Bassendean Complex-Central and South, which is described as vegetation ranging from woodland of *Eucalyptus marginata* (jarrah) - *Allocasuarina fraseriana* (sheoak) - *Banksia* species, to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of jarrah to *Eucalyptus todtiana* (pricklybark) in the vicinity of Perth, • Cannington Complex, which is described as a mosaic of vegetation from adjacent vegetation complexes of Bassendean, Karrakatta, Southern River and Vasse, and • Guildford Complex, which is described as a mixture of open forest to tall open forest of *Corymbia calophylla* (marri) - *Eucalyptus wandoo* (wandoo) - jarrah and woodland of wandoo (with rare occurrences of *Eucalyptus lane-poolei* (salmon white gum)). Minor components include *Eucalyptus rudis* (flooded gum) - *Melaleuca rhaphiophylla* (swamp paperbark) (Heddle et al., 1980).
Vegetation condition	The flora and vegetation assessments undertaken by PGV Environmental on behalf of Aurora Environmental (Aurora Environmental, 2020; PGV Environmental, 2020; PGV Environmental, 2019) indicate that the vegetation within the proposed clearing area is in Completely Degraded (Keighery, 1994) condition, described as the structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery, 1994). These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in Appendix D.
Climate and landform	The application area occurs on gently undulating topography, sloping gently down from the northern extent in Carlisle to the southern extent near Beckenham, ranging between 15 metres Australian Height Datum (m AHD) in the north to approximately 4 m AHD in the south (PTA, 2021a). The application area has a mean annual maximum temperature of 25.6°C and a mean annual minimum temperature of 13.4°C. The mean annual rainfall and the annual evapotranspiration rate are both 800 millimetres.
Soil description and land degradation risk	The soil within the application area is mapped as the following systems: • EnvGeol S10 Phase (213Pj__S10), described as sand, as S8 as relatively thin veneer over sandy clay to clayey sand and of eolian origin. Comprises approximately 53 per cent of the application area, • EnvGeol S8 Phase (212Bs__S8), described as sand, very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted and of eolian origin. Comprises approximately 38 per cent of the application area, and • EnvGeol LS5 Phase (211Sp__LS5), described as limestone, white to cream, fine-grained, algal lamination common. Comprises approximately nine per cent of the application area (DPIRD, 2022).

Characteristic	Details
	The soil types within the application area are mapped as having a low risk of land degradation resulting from water erosion, salinity, waterlogging, flooding, and phosphorus export, but as having a moderate to high risk of wind erosion and subsurface acidification (DPIRD, 2021).
Waterbodies and hydrogeography	The desktop assessment and aerial imagery indicated that the application area intersects several manmade drainage lines. However, the closest natural watercourse is the Canning River and major tributaries, located approximately one kilometre south-west of the application area and separated by road, railway, residential and industrial infrastructure. The closest wetlands to the application area are a Multiple Use dampland (basin) located adjacent to the application area between George and Wharf Streets in Queens Park, and the Carousel Swamp Mutliple Use wetland located adjacent to the application area at Gerard Street in Cannington, both separated from the application area by road infrastructure. The application area is mapped within the Perth Groundwater Area, a proclaimed groundwater area under the *Rights in Water and Irrigation Act 1914* (the RIWI Act). The application area does not transect any proclaimed surface water areas or any water resources proclaimed under either the *Metropolitan Water Supply Sewerage and Drainage Act 1909* or *Country Areas Water Supply Act 1947* (CAWS Act). Groundwater salinity within the application area is mapped at 500 to 1000 milligrams per litre total dissolved solids.
Flora	The desktop assessment identified that a total of 126 rare flora species have been recorded within the local area, comprising 12 Priority 1 (P1) flora, 17 Priority 2 (P2) flora, 46 Priority 3 (P3) flora, 24 Priority 4 (P4) flora, 26 threatened flora (Western Australian Herbarium, 1998-). None of these existing records occur within the application area, with the closest records being occurrences of *Diuris purdiei* (T), *Grevillea thelemanniana* (T), *Morelotia australiensis* (T), *Schoenus benthamii* (P3), *Schoenus pennisetis* (P3) and *Verticordia lindleyi* subsp. *lindleyi* (P4) approximately 0.9 kilometres from the application area. Two flora and vegetation surveys have been undertaken within the application area; a detailed flora and vegetation survey for the level crossing at Oats Street over two days in October 2018 (PGV Environmental, 2019) and a reconnaissance flora and vegetation survey for the entire Perth to Armadale Rail Line over five days in January and February 2020 (PGV Environmental, 2020). No threatened or priority flora species were identified within the application area or the greater survey areas at the time of either survey (PGV Environmental, 2020; PGV Environmental, 2019). The reconnaissance flora and vegetation survey for the Perth to Armadale Rail Line noted that the greater survey area, which included the entirety of the application area, was unlikely to provide suitable habitat for any threatened or priority flora species, given the Completely Degraded (Keighery, 1994) condition of the vegetation and the significant ongoing disturbance from adjacent road and railway infrastructure (PGV Environmental, 2020). Although the reconnaissance flora and vegetation survey was undertaken outside of the spring flowering season, it is acknowledged that the majority of the conservation significant flora species recorded in the local area are perennial species and, although not flowering, are likely to have been observed if present at the time of the summer survey, given the Completely Degraded (Keighery, 1994) condition of the application area and distinct lack of native understorey. With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the habitat preferences and conservation statuses of the aforementioned species, the distribution and extent of existing records, and biological survey information as summarised above (Aurora Environmental, 2020; PGV Environmental, 2020; PGV Environmental, 2019), the application area is unlikely to provide suitable or significant habitat for threatened or priority flora species and impacts to flora species did not require further consideration.

Characteristic	Details
Ecological communities	The desktop assessment identified that the closest state-listed threatened ecological community (TEC) is an occurrence of the Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain (Muchea Limestone) TEC, located approximately 230 metres east of the application area, separated by historically cleared land and road infrastructure. The closest state-listed priority ecological community (PEC) is an occurrence of the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Banksia Woodlands) PEC, located approximately 430 metres west of the application area, separated by industrial and road infrastructure. With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information (Aurora Environmental, 2020; PGV Environmental, 2020; PGV Environmental, 2019), the vegetation within the application area is unlikely to be representative of these communities, despite its proximity to existing records, and impacts to ecological communities did not require further consideration.
Fauna	The desktop assessment identified that a total of 42 threatened or priority fauna species have been recorded within the local area, including 12 threatened fauna species, six priority fauna species, 21 fauna species protected under international agreement, and three other specially protected fauna species (DBCA, 2007-). None of these existing records occur within the application area, with the closest record being an occurrence of *Isoodon fusciventer* (quenda) approximately 60 metres from the application area. With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the habitat preferences and conservation statuses of the aforementioned species, the distribution and extent of existing records, and biological survey information (Harewood, 2020), the application area may provide suitable habitat for four conservation significant fauna species and impacts to these species required further consideration (see Appendix B.3).

B.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion**					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Heddle vegetation complex*					
Bassendean Complex-Central and South	87,476.26	23,508.66	26.87	4377.36	5.0
Cannington Complex	16,661.33	1,965.94	11.80	981.34	5.89
Guildford Complex	90,513.13	4,607.91	5.09	287.49	0.32
Local area					
10-kilometre radius	42,981.29	7,284.68	16.95	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

B.3. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the distribution and extent of existing records, and biological survey information (Aurora Environmental, 2020; PGV Environmental, 2020; PGV Environmental, 2019), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus banksii naso (Forest red-tailed black cockatoo)	VU	Y	Y	0.1	129	Y
Calyptorhynchus baudinii (Baudin's cockatoo)	EN	Y	Y	3.6	34	Y
Calyptorhynchus latirostris (Carnaby's cockatoo)	EN	Y	Y	0.1	1130	Y
Falco peregrinus (Peregrine falcon)	OS	Y	Y	0.8	57	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared may contain suitable habitat for conservation significant fauna species. However, given the area proposed to be cleared comprises scattered native vegetation interspersed with non-native or planted vegetation, that has been subject to significant disturbance through historical clearing activities and urbanisation, the application area is not considered likely to comprise a high level of biodiversity.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared contains potential foraging, roosting, or breeding habitat for four conservation significant fauna species.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is not considered likely to contain suitable or significant habitat for flora species listed under the BC Act, given the Completely Degraded (Keighery, 1994) condition of the vegetation and the significant ongoing disturbance from adjacent road and railway infrastructure.	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The area proposed to be cleared consists of completely degraded marri and jarrah woodland and *Xanthorrhoea preissii* shrubland that has been subject to significant disturbance through historical clearing activities and urbanisation and is not considered to include vegetation representative of any TEC listed under the BC Act or EPBC Act. Given the separation from the nearest TEC through road infrastructure, the proposed clearing is not likely to impact or be necessary for the maintenance of any TEC.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation types and native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia, however, is consistent with the 10 per cent threshold for constrained areas.	May be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance and separation from the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of any nearby conservation areas.	Not likely to be at variance	No

Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given the application area intersects several drainage lines and is adjacent to two wetlands, the vegetation may be considered to be growing in, or in association with, an environment associated with a watercourse or wetland. However, it is acknowledged that the drainage lines are manmade and the wetlands adjacent to the application area have been highly disturbed and modified by historical clearing and adjacent residential and industrial land uses. Noting the condition of the vegetation and extent of the clearing in the context of the landscape, the proposed clearing is unlikely to result in any significant or long-term impacts to the ecological values of riparian communities in the local area or to significantly impact surface water quality.	May be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are moderately susceptible to wind erosion and subsurface acidification. Noting the extent of the proposed clearing, the highly disturbed condition of the vegetation, and that the final land use will be infrastructure associated with the elevated rail line or landscaped POS that will not leave bare ground exposed to weathering for extended periods, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	No
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Noting that the application area does not transect any natural sources of perennial surface water, the condition of the vegetation, and extent of the clearing in the context of the landscape and adjacent land uses, the proposed clearing is unlikely to result in significant or long-term impacts to surface or groundwater quality.	Not likely to be at variance	No .
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding or waterlogging. Noting this, the extent of the proposed clearing and condition of the vegetation within the application area, the proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of flooding.	Not likely to be at variance	No

Appendix D. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E. Biological survey information excerpts

The applicant has commissioned various studies to identify and assess the ecological values present in the application area. The findings of these biological surveys have been summarised in the supporting document produced by Aurora Environmental (2020) *'Environmental Advice, Armadale Train Line, Platform and Signalling Upgrade Program'* and made specific to the application area in the supporting document produced by the applicant (PTA, 2021a). The biological surveys used to inform the assessment of this clearing permit application are summarised in Table 1. Survey mapping excised from these biological surveys is available in Figures 2 and 3 below.

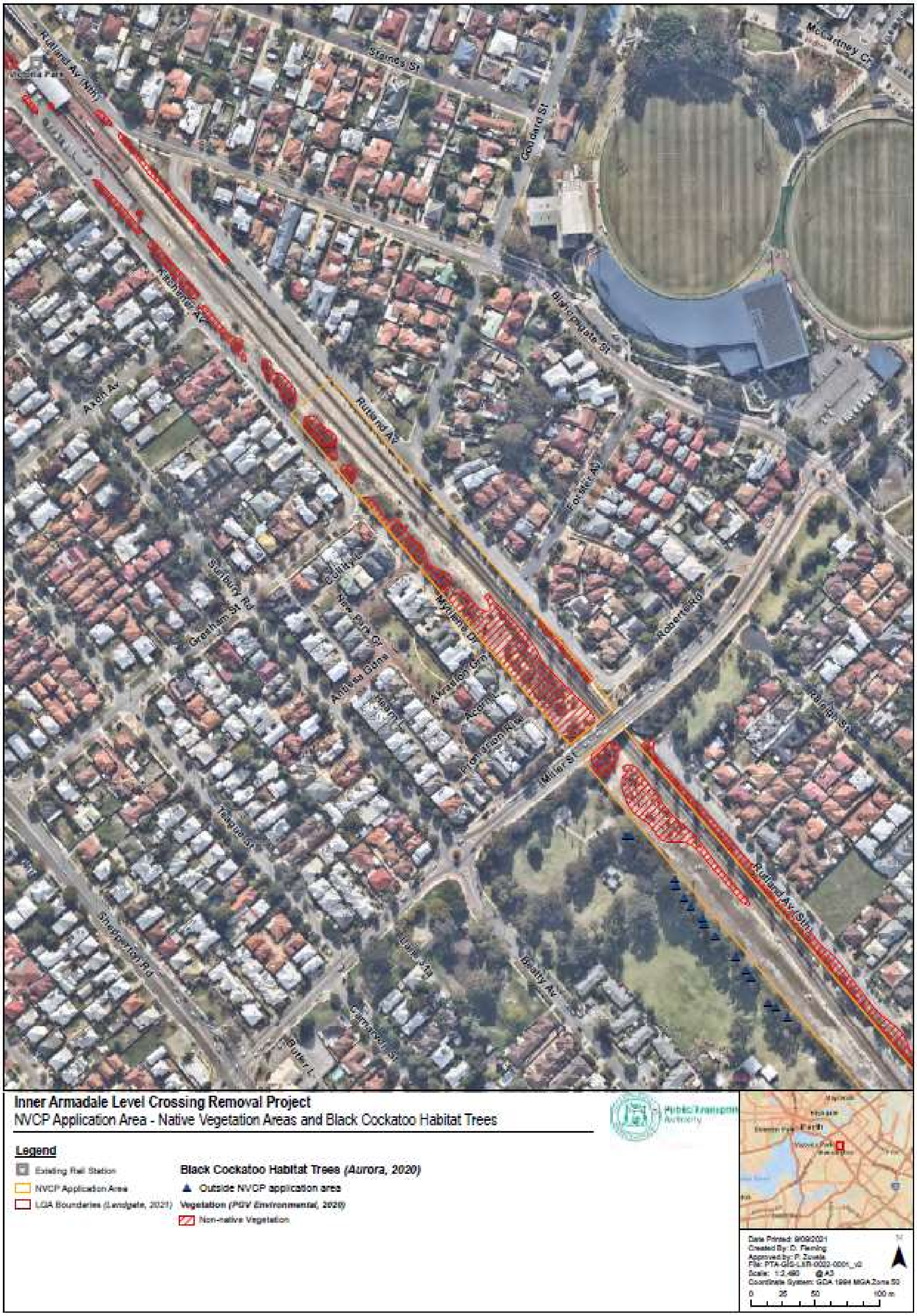
Additional surveys were undertaken by Harewood (2019) and PGV Environmental (2019) for the Wharf Street level crossing site. However, as the survey areas at Wharf Street were outside of the boundaries of the clearing permit application, the results of these surveys were not used to inform the assessment.

Table 2. Biological surveys completed within the application area and used to inform the assessment of clearing permit application CPS 9427/1 (PTA, 2021a).

Author	Title	Comments
PGV Environmental (2019)	METRONET Oats Street Level Crossing – Flora and Vegetation Survey	A detailed flora and vegetation survey undertaken in accordance with the *EPA Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). PGV Environmental (2019) assessed the flora and vegetation within discrete survey areas for the level crossing at Oats Street over two days in October 2018. The assessment was conducted by an experienced botanist and involved the following: • Desktop assessment and database searches, and • Field assessment on 12 and 23 October 2018, including: o Thorough site walkover to record vegetation types and native species in the survey area, o Surveys of quadrats and relevès in areas of native vegetation, o Targeted searches for threatened and priority flora, and significant plant species, o Description and mapping of vegetation types and condition, and

		○ Compilation of a flora list (PGV Environmental, 2019).
PGV Environmental (2020)	Perth to Armadale Rail Line – Flora and Vegetation Survey	An out of season reconnaissance survey over five days in January and February 2020, to assess the flora and vegetation along the Armadale train line from Perth to south of Armadale station. The survey methodology was undertaken in accordance with the *EPA Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016), with the exception of summer timing. The assessment was conducted by an experienced botanist and involved the following: • Desktop assessment and database searches, and • Field assessment over five days between 30 January and 10 February 2020, including: ○ Thorough site walkover to record vegetation types and native species in the survey area, ○ Surveys of quadrats and relevès in areas of native vegetation, ○ Targeted searches for threatened and priority flora, and significant plant species, and ○ Description and mapping of vegetation types and condition (PGV Environmental, 2020). The assessment also incorporated the results from the Oats Street and Wharf Street surveys conducted by PGV Environmental (2019).
Harewood (2020)	Fauna Habitat Assessment - Armadale Train Line	A reconnaissance fauna survey as defined in the *EPA Technical Guidance – Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020) and targeted black cockatoo habitat assessment assessed fauna habitats along the Armadale train line from Perth to south of Armadale station in February 2020. The assessment was conducted by an experienced zoologist and involved the following: • Desktop assessment and literature review, • Field surveys over several days in February 2020, including: ○ Thorough site walkover to record vegetation units, landforms, and soils, to define broad fauna habitat types, and ○ Surveys of transects to search for evidence (i.e., individuals, tracks, scats, calls) of conservation significant species. • Black cockatoo habitat assessment over several days in February 2020, including: ○ An assessment of all potential breeding and roosting trees within the application area during site walkover, ○ Examination of habitat trees with potentially suitable breeding hollows for breeding evidence with binoculars, ○ An assessment of foraging habitat, and ○ Examination of potential roosting trees for evidence of roosting. The assessment also incorporated the results from surveys at Oats Street and Wharf Street conducted by Harewood (2019).

(a)


Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Non-native Vegetation
Rutland Av (Nth)
Stanes St
Goddard St
Kitchener Av
Axon Av
Rutland Av
Foster Av
Roberts Rd
Miller St
Rutland Av (Sth)
Beatty Av
Carnarvon St
Shepperton Rd
McCartney Cr
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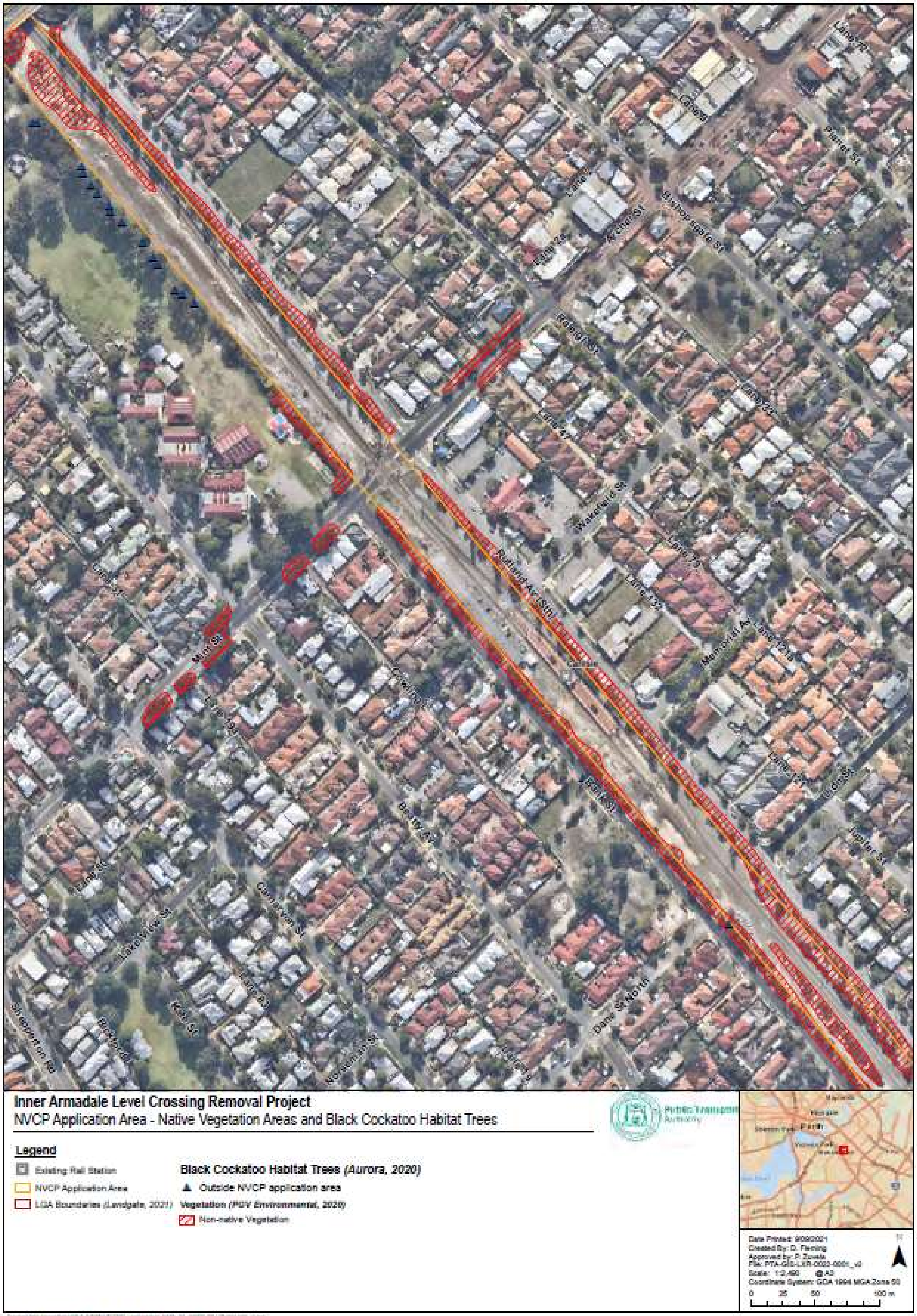
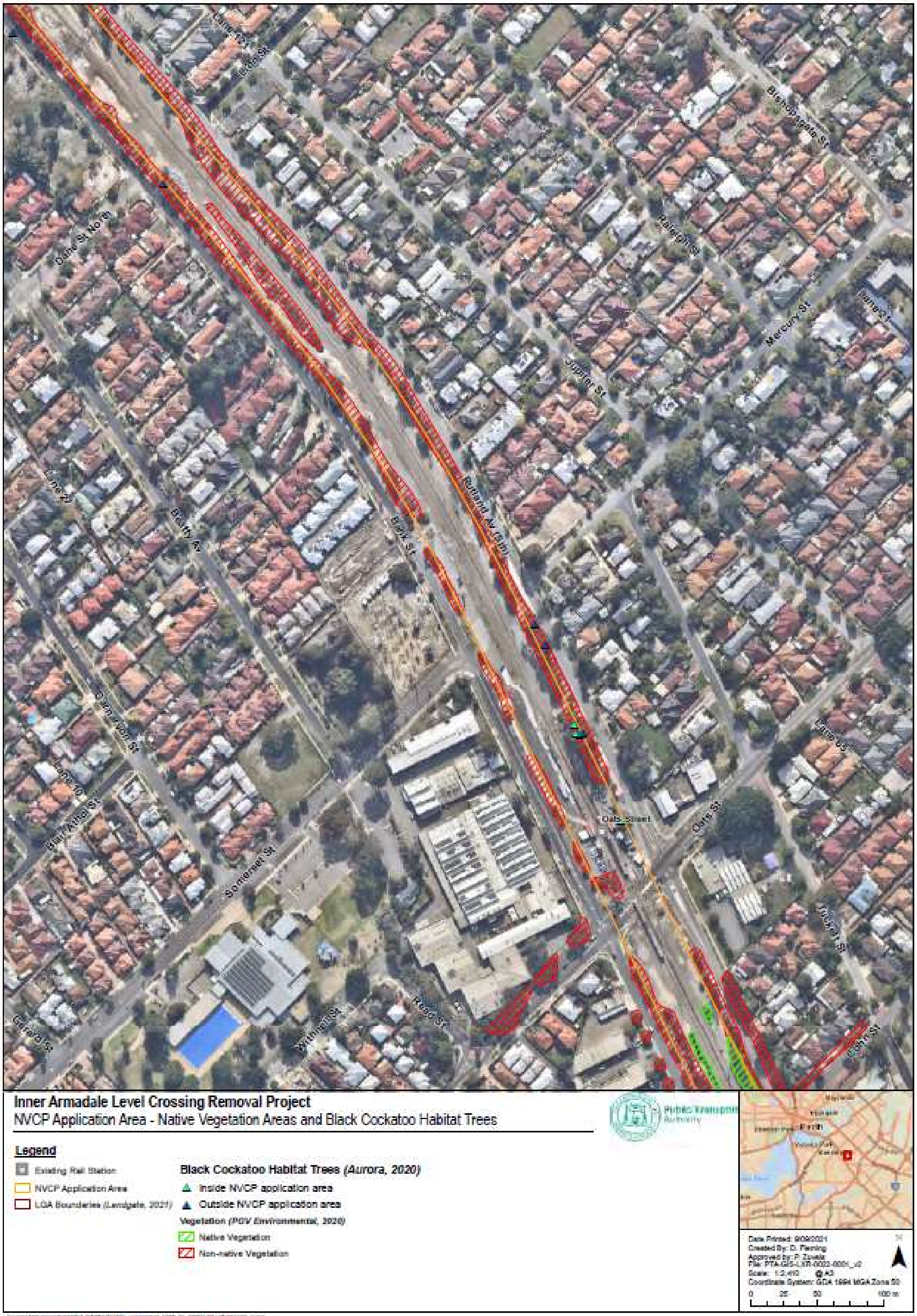
(b)


Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Non-native Vegetation
Created By: D. Fleming
Coordinate System: GDA 1994 MGA Zone 50
0 25 50 100 m
Perth
Archer St
Bishopsgate St
Planet St
Raleigh St
Wakefield St
Rutland Av (Sth)
Memorial Av
Mint St
Beatty Av
Carnarvon St
Lakeview St
Kent St
Dane St North
Jupiter St

(c)


Bishopsgate St
Raleigh St
Mercury St
Jupiter St
Rutland Av (PTA)
Bank St
Beatty Av
Somerset St
Oats Street
Oats St
Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Public Transport Authority
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Native Vegetation
Non-native Vegetation
Perth

(d)


Rutland Av (Sth)
Rutland Av North Side
Welshpool Rd
Sevenoaks St
Briggs St
Cohn St
Forward St
Swansea St East
Raleigh St
Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Native Vegetation
Non-native Vegetation
Perth
Created By: D. Fleming
Approved by: P. Zuvela
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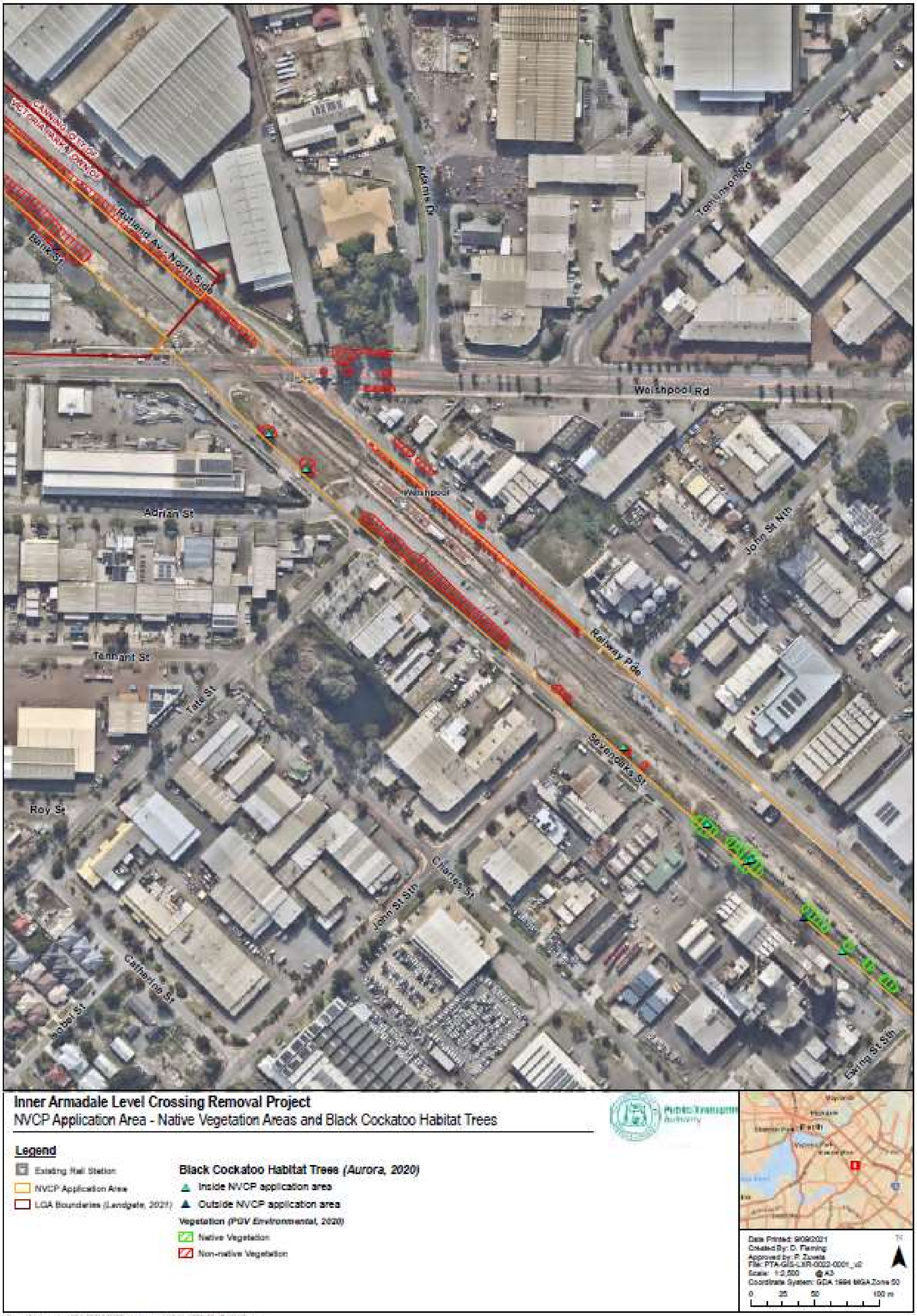
50
100 m

(e)



Welshpool Rd
Welshpool
Adams Dr
Tomlinson Rd
Rutland Av - North Side
Bank St
Adrian St
John St Nth
Railway Pde
Tennant St
Tate St
Sevenoaks St
Roy St
Charles St
John St Sth
Catherine St
Isobel St
Ewing St Sth
Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Native Vegetation
Non-native Vegetation
Date Printed: 9/09/2021
Created By: D. Fleming
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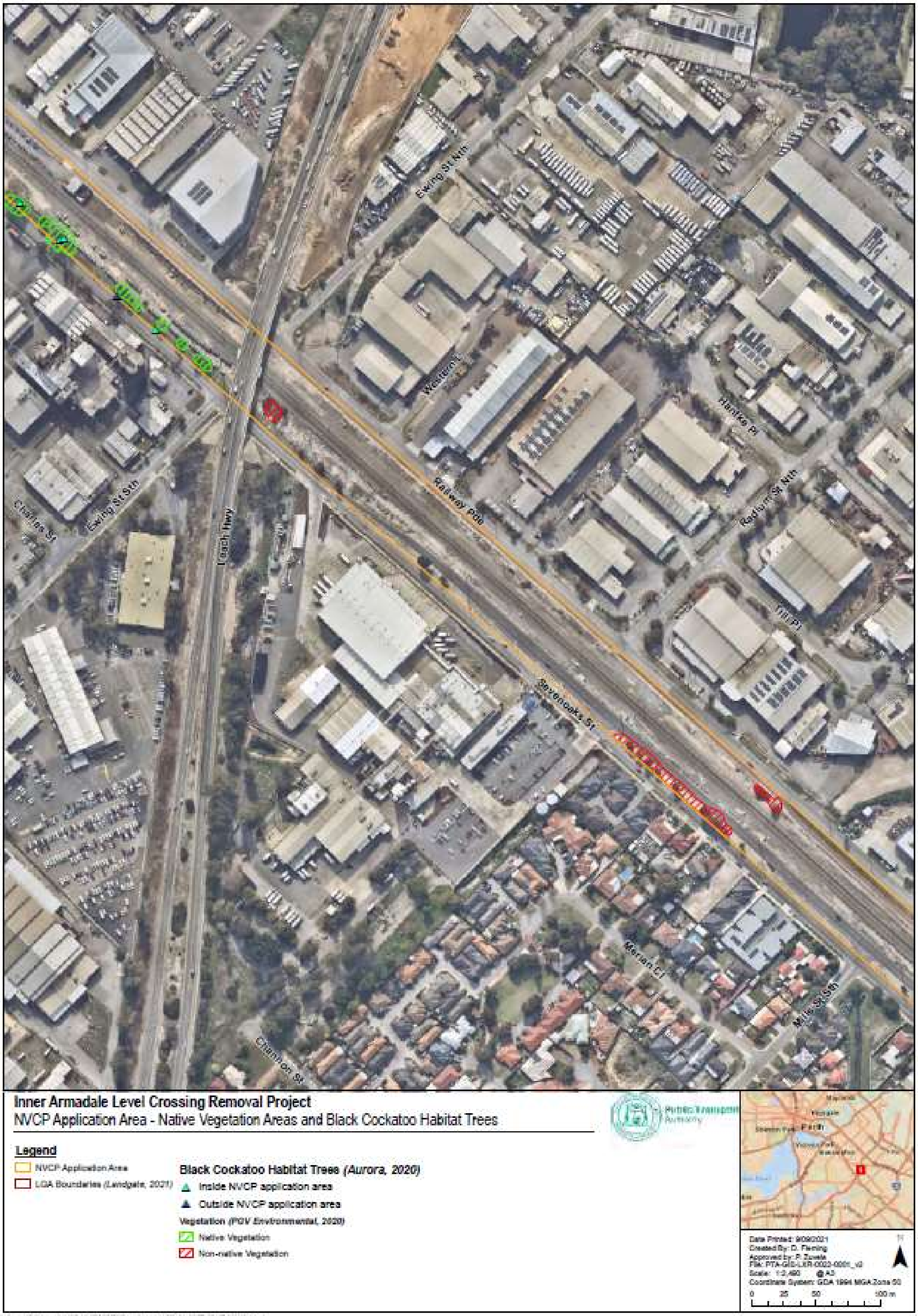
(f)



Ewing St Nth
Westpoint
Hanke Pl
Railway Pde
Radium St Nth
Ewing St Sth
Leach Hwy
Sevenoaks St
Tilt Pl
Merlan Cl
Chamion St
Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Native Vegetation
Non-native Vegetation
Perth
Created By: D. Fleming
Approved by: P. Zovela
Coordinate System: GDA 1994 MGA Zone 50
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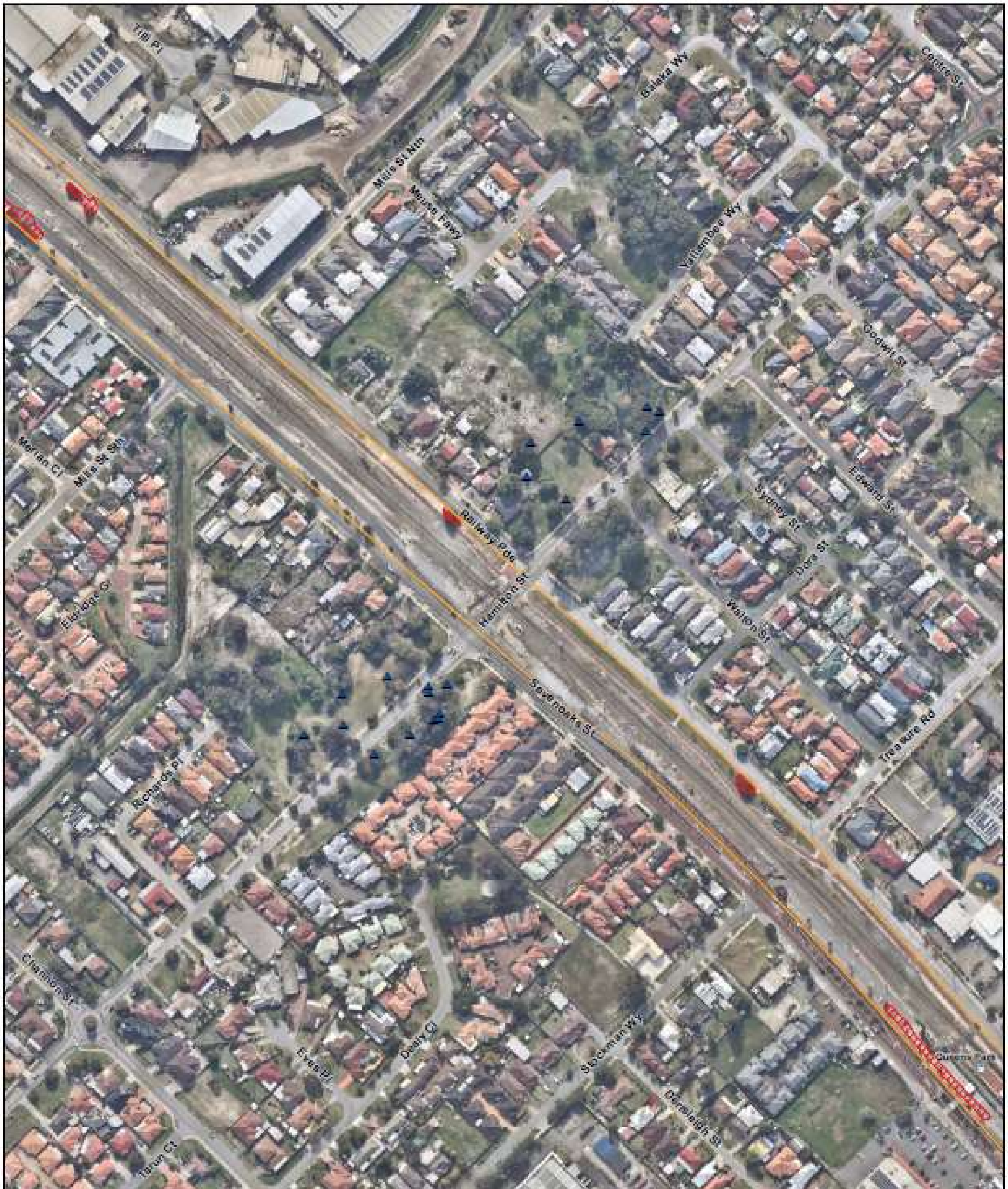
25
50
100 m

(g)



Inner Armadale Level Crossing Removal Project

NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees

Public Transport Authority

Legend

- Existing Rail Station
- NVCP Application Area
- LGA Boundaries (Landgate, 2021)

Black Cockatoo Habitat Trees *(Aurora, 2020)*

- ▲ Outside NVCP application area

Vegetation *(PGV Environmental, 2020)*

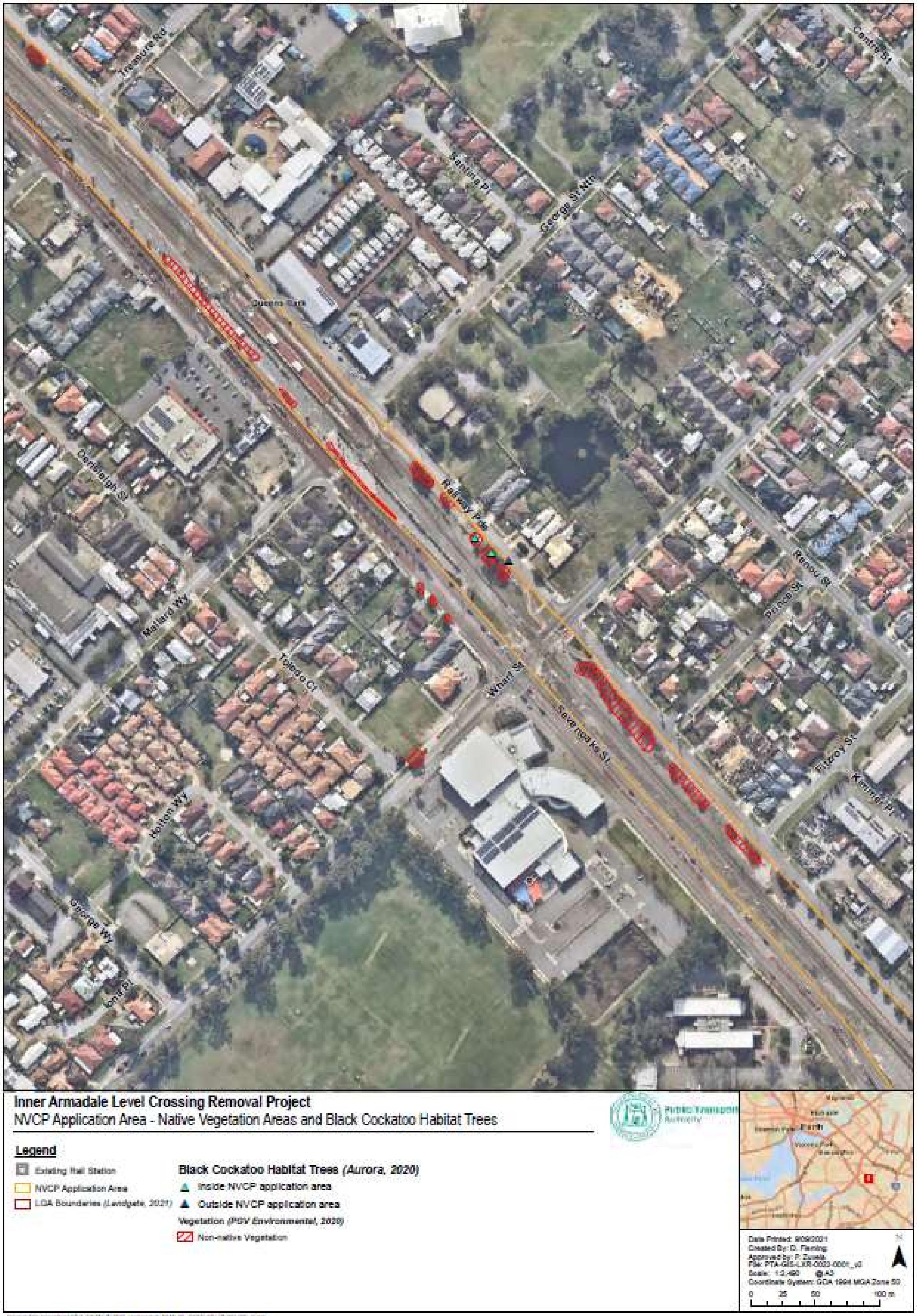
- Non-native Vegetation

Created By: D. Fleming

Coordinate System: GDA 1994 MGA Zone 50

0 25 50 100 m

(h)


Treasure Rd
Centre St
Santina Pl
George St Nth
Queens Park
Denbeigh St
Railway Pde
Ranford St
Prince St
Mallard Wy
Toledo Cl
Wharf St
Sevenoaks St
Fitzroy St
Kinniard Pl
Holton Wy
George Wy
Iona Pl
Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Non-native Vegetation
Perth
Scale: 1:2,490 @A3
Coordinate System: GDA 1994 MGA Zone 50
0
25
50
100 m

(i)


Fitzroy St
Knight Pl
Wellington St
Cunnington Wy
Thomas St
Renou St
Davies St
Gibbs St
Railway Pde
Cannington
Henry St
Sevenoaks St
Cecil Av
Delaney Wy
Gerard St
Lake St
Grove Av
Jameson St
Bent St
Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
Existing Rail Station
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Vegetation (PGV Environmental, 2020)
Non-native Vegetation
Perth
Coordinate System: GDA 1994 MGA Zone 50
0
25
50
100 m

(j)


Inner Armadale Level Crossing Removal Project
NVCP Application Area - Native Vegetation Areas and Black Cockatoo Habitat Trees
Legend
NVCP Application Area
LGA Boundaries (Landgate, 2021)
Black Cockatoo Habitat Trees (Aurora, 2020)
Inside NVCP application area
Outside NVCP application area
Vegetation (PGV Environmental, 2020)
Native Vegetation
Non-native Vegetation
Gerard St
Station St Nth
Redcliffe St
Renou St
Henry St
Albion St
Lacey St
Head Cl
Railway Pde
Sevenoaks St
Sevenoaks Street Service Rd
Jameson St
Bem St
Station St Sth
Hogarth St East 2
Hogarth St East 1
Morgan St
Crawford St
Marriot St
Nicholson Rd Nth East Svc Rd
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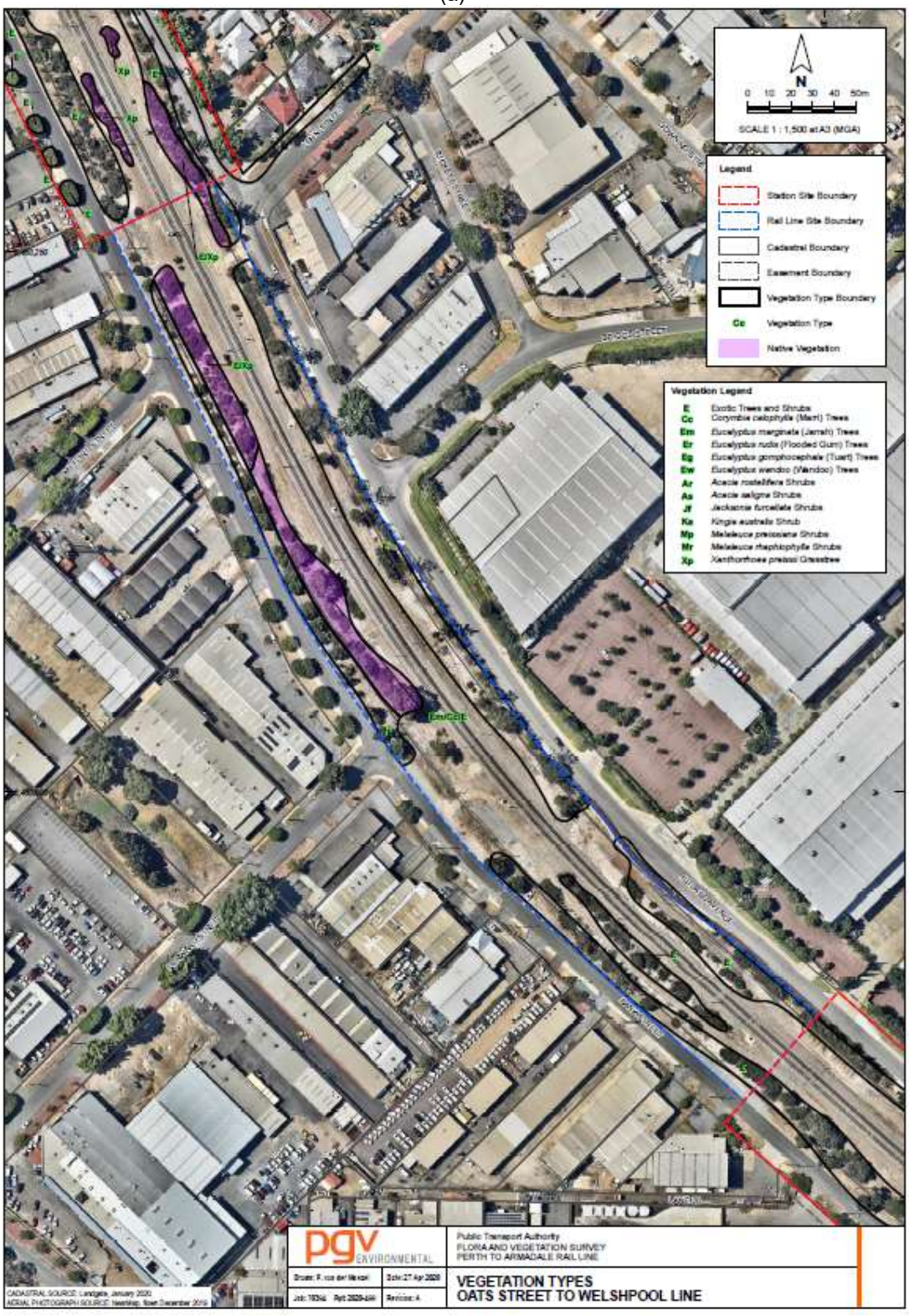
(k)

Figure 2(a)-(k). Native vegetation areas and black cockatoo habitat tree mapping for clearing permit application CPS 9427/1 (PTA, 2021a).

(a)


N
0 10 20 30 40 50m
SCALE 1 : 1,500 at A3 (MGA)
Legend
Station Site Boundary
Rail Line Site Boundary
Cadastral Boundary
Easement Boundary
Vegetation Type Boundary
Ge Vegetation Type
Native Vegetation
Vegetation Legend
E Exotic Trees and Shrubs
Cc Corymbia calophylla (Marri) Trees
Em Eucalyptus marginata (Jarrah) Trees
Er Eucalyptus rudis (Flooded Gum) Trees
Eg Eucalyptus gomphocephala (Tuart) Trees
Ew Eucalyptus wandoo (Wandoo) Trees
Ar Acacia rostellifera Shrubs
As Acacia saligna Shrubs
Jf Jacksonia furcellata Shrubs
Ka Kingia australis Shrub
Mp Melaleuca preissiana Shrubs
Mr Melaleuca rhaphiophylla Shrubs
Xp Xanthorrhoea preissii Grasstree
EmCBE
pgv ENVIRONMENTAL
Public Transport Authority
FLORA AND VEGETATION SURVEY
PERTH TO ARMADALE RAIL LINE
VEGETATION TYPES
OATS STREET TO WELSHPOOL LINE

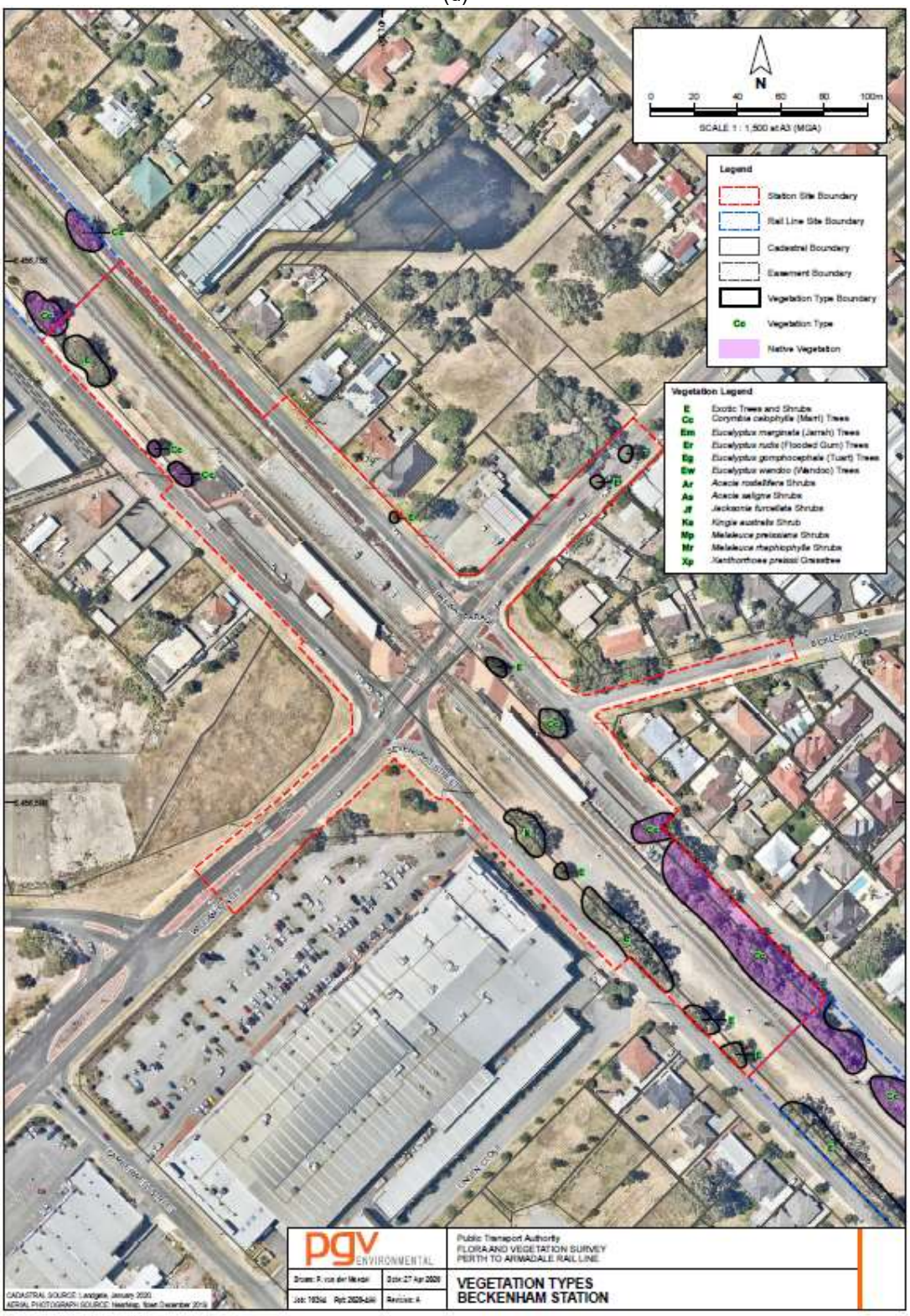
(b)


N
0 50 100 150 200 250m
SCALE 1 : 4,000 at A3 (MGA)
Legend
Station Site Boundary
Rail Line Site Boundary
Cadastral Boundary
Easement Boundary
Vegetation Type Boundary
Cc Vegetation Type
Native Vegetation
Vegetation Legend
E Exotic Trees and Shrubs
Cc Corymbia calophylla (Marri) Trees
Em Eucalyptus marginata (Jarrah) Trees
Er Eucalyptus rudis (Flooded Gum) Trees
Eg Eucalyptus gomphocephala (Tuart) Trees
Ew Eucalyptus wandoo (Wandoo) Trees
Ar Acacia rostellifera Shrubs
As Acacia saligna Shrubs
Jf Jacksonia furcellata Shrubs
Ka Kingia australis Shrub
Mp Melaleuca preissiana Shrubs
Mr Melaleuca rhaphiophylla Shrubs
Xp Xanthorrhoea preissii Grasstree
pgv ENVIRONMENTAL
Public Transport Authority
FLORA AND VEGETATION SURVEY
PERTH TO ARMADALE RAIL LINE
VEGETATION TYPES
WELSHPOOL TO QUEENS PARK LINE

(c)


N
0 50 100 150 200m
SCALE 1 : 2,750 at A3 (MGA)
Legend
Station Site Boundary
Rail Line Site Boundary
Cadastral Boundary
Easement Boundary
Vegetation Type Boundary
Cc Vegetation Type
Native Vegetation
Vegetation Legend
E Exotic Trees and Shrubs
Cc Corymbia calophylla (Marri) Trees
Em Eucalyptus marginata (Jarrah) Trees
Er Eucalyptus rudis (Flooded Gum) Trees
Eg Eucalyptus gomphocephala (Tuart) Trees
Ew Eucalyptus wandoo (Wandoo) Trees
Ar Acacia rostellifera Shrubs
As Acacia saligna Shrubs
Jf Jacksonia furcellata Shrubs
Ka Kingia australis Shrub
Mp Melaleuca preissiana Shrubs
Mr Melaleuca rhaphiophylla Shrubs
Xp Xanthorrhoea preissii Grasstree
pgv ENVIRONMENTAL
Public Transport Authority
FLORA AND VEGETATION SURVEY
PERTH TO ARMADALE RAIL LINE
VEGETATION TYPES
CANNINGTON TO BECKENHAM LINE

(d)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0 20 40 60 80 100m
SCALE 1 : 1,500 at A3 (MGA)
Legend
Station Site Boundary
Rail Line Site Boundary
Cadastral Boundary
Easement Boundary
Vegetation Type Boundary
Cc Vegetation Type
Native Vegetation
Vegetation Legend
E Exotic Trees and Shrubs
Cc Corymbia calophylla (Marri) Trees
Em Eucalyptus marginata (Jarrah) Trees
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pgv ENVIRONMENTAL
Public Transport Authority
FLORA AND VEGETATION SURVEY
PERTH TO ARMADALE RAIL LINE
VEGETATION TYPES
BECKENHAM STATION

(e)

Figure 3(a)-(e). Vegetation type mapping for native vegetation areas within clearing permit application CPS 9427/1 (PGV Environmental, 2020).

Appendix F. Sources of information

F.1. GIS databases

Publicly available GIS Databases used (sourced from s):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever Areas 2000 (DPLH-019)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- CAWSA Part 2A Clearing Control Catchments (DWER-004)
- Consanguineous Wetlands Suites (DBCA-020)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- DBCA Statewide Vegetation Statistics
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments - Catchments (DWER-028)
- Hydrographic Catchments - Divisions (DWER-029)
- Hydrography, Linear (Hierarchy) (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics (DPIRD-006)
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Systems (DPIRD-064)
- Vegetation Complexes - Swan Coastal Plain (DBCA-046)

Restricted GIS Databases used:

- Conservation Covenants Western Australia (DPIRD-023)
- Contaminated Sites Database - Restricted (DWER-073)
- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

F.2. References

Aurora Environmental (2020) *Environmental Advice, Armadale Train Line, Platform and Signalling Upgrade Program prepared for the Public Transport Authority*, received 13 September 2021 (DWER Ref: A2046307).

Australian Museum (2021) Perengrine falcon (Falco peregrinus). The Australian Museum, New South Wales. Available from: https://australian.museum/learn/animals/birds/peregrine-falcon/ (accessed November 2021).

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

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

Department of Biodiversity, Conservation and Attractions (DBCA) (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. Available from: http://naturemap.dpaw.wa.gov.au/ (accessed November 2021).

Department of Environment and Conservation (DEC) (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, Canberra.

Department of Environment and Conservation (DEC) (2012) *Fauna profiles: Quenda, Isoodon obesulus fusciventer*. Department of Environment and Conservation, Western Australia.

Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.

Department of Parks and Wildlife (2013) *Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan*. Department of Parks and Wildlife, Perth, Western Australia.

Department of Primary Industries and Regional Development (DPIRD) (2021) *NRInfo Digital Mapping. Department of Primary Industries and Regional Development.* Government of Western Australia. Available from: https://maps.agric.wa.gov.au/nrm-info/ (accessed November 2021).

Department of Water and Environmental Regulation (DWER) (2019) *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Department of Water and Environmental Regulation (DWER) (Science and Planning - Contaminated Sites) (2021) *Rights in Water and Irrigation Act 1914 advice for clearing permit application CPS 9427/1*, received 28 October 2021 (DWER Ref: A2058955).

Department of Water and Environmental Regulation (DWER) (2022) *Rakali - water rat - Hydromys chrysogaster*. Department of Water and Environmental Regulation, Perth. Available from: https://rivers.dwer.wa.gov.au/species/hydromys-chrysogaster/.

Environmental Protection Authority (EPA) (2016) *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.

Environmental Protection Authority (EPA) (2019) *EPA Technical Report: Carnaby's Cockatoo in Environmental Impact Assessment in the Perth and Peel Region. Advice of the Environmental Protection Authority under Section 16(j) of the Environmental Protection Act 1986*. Environmental Protection Authority, Western Australia.

Environmental Protection Authority (EPA) (2020) *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment.* Available from:

https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf.

Government of Western Australia (2019a) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth. Available from: https://catalogue.data.wa.gov.au/dataset/dbca.

Government of Western Australia (2019b) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* WA Department of Biodiversity, Conservation and Attractions. Available from: https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics.

Harewood, G. (2020) *Fauna Habitat Assessment, Armadale Train Line, on behalf of the Public Transport Authority*, received 13 September 2021 (DWER Ref: A2046307).

Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980) *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Town of Victoria Park (2021) *Advice for clearing permit application CPS 9427/1*, received 13 October 2021 (DWER Ref: DWERDT51543).

PGV Environmental (2019) *METRONET Oats Street Level Crossing, Flora and Vegetation Survey, prepared for the Public Transport Authority*, received 13 September 2021 (DWER Ref: A2046305).

PGV Environmental (2020) *Perth to Armadale Rail Line, Flora and Vegetation Survey, prepared for the Public Transport Authority*, received 13 September 2021 (DWER Ref: A2046307).

Public Transport Authority of Western Australia (PTA) (2021a) *Clearing permit application CPS 9427/1 and supporting documentation*, received 13 September 2021 (DWER Ref: DWERDT503161 and A2055496).

Public Transport Authority of Western Australia (PTA) (2021b) *Supporting information for clearing permit application CPS 9427/1,* received 14 December 2021 (DWER Ref: A2074043).

Threatened Species Scientific Committee (TSSC) (2018) *Conservation Advice Westralunio carteri Carter's freshwater mussel*. Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/86266-conservation-advice-15022018.pdf.

Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation.

Western Australian Herbarium (1998-) *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. Available from: https://florabase.dpaw.wa.gov.au/ (accessed November 2021).