

Prepared for: Arrow CSG Australia Pty Ltd

Preliminary Documentation

Surat Gas Project (SGP) North Solar Farm (EPBC 2024/10002)

Date: 17 September 2026

Document information

Document	Preliminary Documentation
Attexo ref	ARR-005
Date	17 September 2026
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Reviewed by	Steve Fox

Quality information

Rev	Date	Details	Authorisation	
			Name/position	Signature
0	22-10-2025	Final		
1	29-10-2025	Minor amendments		
2	03-02-2026	Response to Adequacy review		
3	23-02-2026	Minor amendments		
4	05-06-2026	Response to Adequacy review (Round 2)		
5	17-09-2026	Updates to reflect name change from DCCEEW to the National EPA from 1 July 2026	Kate Rigg, Principal Environmental Planner	

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Attexo Group Pty Ltd 2026
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Executive Summary

Arrow CSG Australia Pty Ltd (Arrow CSG) is proposing to develop the Surat Gas Project (SGP) North Solar Farm (the Project) on land at Retreat Road, Kowguran approximately 18 km north of Miles in Queensland. The Project will supply renewable electricity to a planned hybrid power facility (HPF) being developed to power the SGP North Field Compression Station (FCS) and is a key initiative in Arrow Energy's plans to reduce greenhouse gas emissions and meet net zero targets.

The Project involves the construction, operation, maintenance and decommissioning of a 17 Megawatt peak (MWp) solar farm on Lot 17 on Plan AU199 comprising:

- Approximately 30,000 photovoltaic (PV) solar panels mounted on single-axis tracking systems;
- Four (4) modular power conversion stations (PCS) incorporating inverters, transformers and switchgear;
- Two meteorological monitoring stations;
- Approximately 1.7 km internal access roads including a connection to the internal road network being developed on Girrahween Station as part of the broader SGP North gasfield development; and
- Approximately 355 m of an 11 kV transmission line connection to the planned HPF (either underground or overhead cabling to be determined during detailed design).

The Development footprint required for the Project encompasses an area of approximately 30.1 ha, located on previously cleared land which supports predominantly non-remnant vegetation and has historically been used for grazing. The layout of the proposed infrastructure is shown in **Figure 1**.

The Project was referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (now the National Environmental Protection Agency (NEPA)) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 11 September 2024.

On 17 February 2025, DCCEEW determined the Project to be a 'controlled action' requiring assessment and approval by Preliminary Documentation (PD) in accordance with Part 8, Division 4 of the EPBC Act. The controlling provisions are listed threatened species and communities (section 18 and 18A of the EPBC Act).

This PD compiles information from the original referral and additional information gathered specifically for the PD to:

- enable interested stakeholders to understand the environmental consequences of the Project on Matters of National Environmental Significance (MNES); and
- support a decision by the Minister about whether to approve the Project under Part 9 of the EPBC Act.

Project need

The planned HPF provides the lowest greenhouse gas emissions intensity available development option to power the FCS, which is forecasted as:

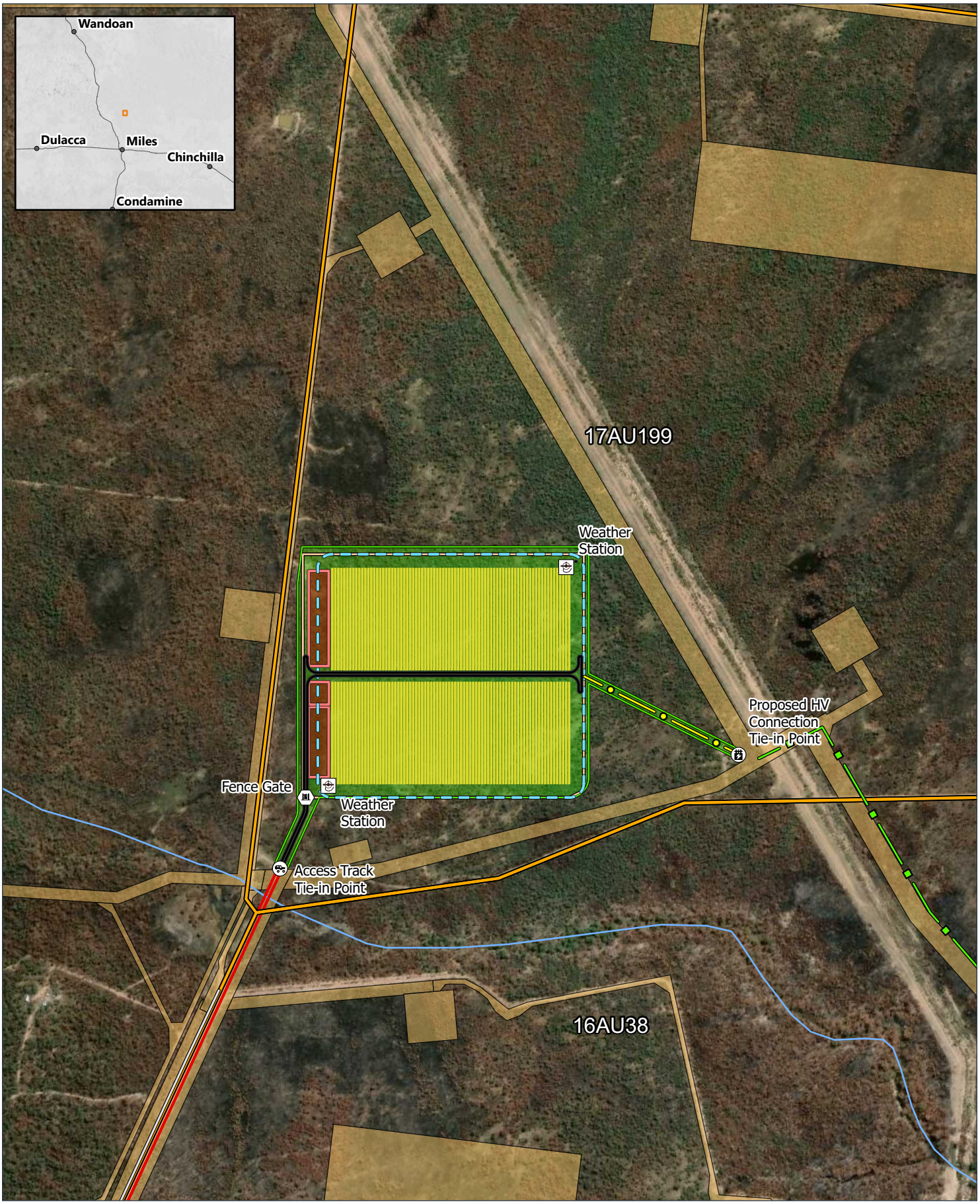
- 41% less than the emissions intensity from the current Queensland electricity grid; and
- 23% less than the prescribed emissions intensity for electricity generation by the Safeguard Mechanism[1].

The potential for the Project to generate up to 17 MWp of solar power significantly reduces Arrow Energy's reliance on fossil fuels for electricity by changing the primary energy source to solar energy and is estimated to result in potential emissions abatement of 21,000 $tCO2_{-e}$ per annum.

Specific benefits of the Project include:

- Approximately 50 jobs are expected to be generated during the 12-month construction period and up to eight direct and indirect jobs during operation;
- Investment is expected in the local region during the construction period.
- Arrow CSG is committed to maximising opportunities for local workers and businesses.

[1] The Safeguard Mechanism is the Australian Government's policy for reducing emissions at Australia's largest industrial facilities.



Project Layout Plan

Figure 1

DWG No: ARR-005_005[I]
DATE: 28/01/2026
DRAWN: DC
REVIEWED KR
SCALE (A4): 1:10,000

N

0 m 250

GDA2020 MGA Zone 56

Proposed Action (within Development Footprint):

- Fence Gate
- Access Track Tie-in Point
- Proposed HV Connection Tie-in Point
- Weather Station
- Solar Panels
- Fenceline
- Solar Farm Internal Access Tracks
- 11kV Connection
- Asset Protection Zone
- Development Footprint
- Temporary Construction Areas

Not Included In Action:

- Watercourse
- Access Track
- 11kV connection (Outside Footprint)
- Project Site
- SGP North - Internal Access Road Network
- SGP North Approved Infrastructure

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Project approvals

The HPF and FCS are part of the broader Surat Gas Project (SGP) which has previously been assessed and approved under the:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) with approval (EPBC 2010/5344) granted on 19 December 2013; and
- Queensland *Environmental Protection Act 1994* (EP Act), with the Environmental Authority (EA001399) as amended on 28 January 2026.

The transmission line and solar farm access road required for the Project will also be developed under the abovementioned approvals. However, the SGP North Solar Farm is being developed separately to Arrow CSG's coal seam gas network and it is intended that the solar farm will be operated by a third-party provider. As such, a separate approval is being sought for the Project under the EPBC Act.

Assessment of ecological values

The ecological values of the Development footprint were initially identified through a combination of desktop and field-based assessments undertaken as part of the EIS and Supplementary EIS process for the broader SGP between 2009 and 2013, and extensive follow up surveys conducted between 2016 and 2017. These studies have provided Arrow CSG with a comprehensive understanding of the ecological values and typical flora and fauna assemblages characteristic of vegetation communities and habitats in the broader SGP area, some of which are present within the SGP North Solar Farm Development footprint.

These studies have been supplemented with targeted field-based assessments conducted for the PD to identify habitat values for MNES threatened species and communities within the Development footprint. No threatened ecological communities (TEC) or MNES flora species were recorded within the Development footprint.

The PD assesses the potential impacts of the Project on seven MNES fauna species assessed as possible or likely to occur based on known records and available habitat within the Development footprint, namely:

- Corben's long-eared bat, *Nyctophilus corbeni* (vulnerable);
- Greater glider, *Petauroides volans* (southern and central) (endangered);
- Koala, *Phascolarctos cinereus* (endangered);
- South-eastern glossy black-cockatoo, *Calyptorhyncus lathami lathami* (vulnerable);
- Squatter pigeon (southern), *Geophaps scripta* (vulnerable)
- Diamond firetail, *Stagonopleura guttata* (vulnerable); and
- Dunmall's snake, *Furina dunmalli* (vulnerable).

Project impacts

The Development footprint contains predominantly regrowth vegetation which has been subject to historical clearing and disturbance and is of lower quality when compared to surrounding remnant areas. The Project is also separated from adjoining remnant areas by a 70 m-wide gas pipeline easement to the east and cleared tracks and fence lines to the west. The Project has been intentionally located to avoid remnant vegetation and higher-value areas of habitat adjoining the Development footprint.

While lower quality when compared with surrounding areas, the direct removal of regrowth vegetation from within the Development footprint will reduce the area of available habitat and is expected to, or may have a significant impact on the following MNES species:

- Corben's long-eared bat – this species may roost under exfoliating bark and forage throughout the Development footprint. The removal of 30.1 ha of foraging habitat of which 19.8 is potential roosting habitat may have a significant impact on this species and offsets are proposed to compensate for the removal of this potential habitat within the Development footprint.
- Koala – this species may occur in the Development footprint on occasion, though in the lower densities characteristic of this species in the region. The removal of 19.8 ha of potential breeding and foraging habitat

(defined as areas containing locally important koala trees (LIKT) as well as 10.3 ha of dispersal habitat is likely to have a significant impact on the koala and offsets are proposed to compensate for the removal of habitat within the Development footprint.

- South-eastern glossy black-cockatoo – the absence of large trees from the Development footprint means there are no suitable nesting hollows for this species however, the presence of *Allocasuarina leuhmanii* (buloke) in regrowth vegetation represents a potential foraging resource. The Project will result in the unavoidable removal of 19.8 ha of this potential foraging habitat. As such, it has been conservatively assumed that the Project may have a significant impact upon this species and offsets are proposed to compensate for the removal of the potential foraging resource.
- Squatter pigeon (southern) – although there are limited records of this highly mobile species in and around the broader SGP, the Project will require the unavoidable removal of 30.1 ha of potential foraging habitat. It is possible that the removal of this potential habitat will result in a significant impact upon this species and offsets are proposed to compensate for the habitat removed.
- Diamond firetail– this species has very broad habitat preferences and possibly utilises the Development footprint on a periodic basis. The Project will require the unavoidable removal of 30.1 ha of potential breeding and foraging habitat. It is possible that the removal of this potential habitat will result in a significant impact upon this species and offsets are proposed to compensate for the habitat removed.
- Dunmall's snake – although not recorded in the vicinity, the Development footprint is within its known range and it is likely that this cryptic species utilises microhabitat features (including soil cracks and other cavities, termite mounds, leaf litter and fallen timber) that are present on the site. The Project will require the unavoidable disturbance to 19.8 ha of potential breeding and foraging habitat. Therefore, a significant impact on this species is possible and offsets are proposed to compensate for this disturbance.

No significant impacts on the greater glider or yakka skink are anticipated as a result of the Project.

A suite of mitigation and management measures are proposed to minimise unavoidable indirect impacts on MNES during construction, operation, maintenance and decommissioning of the proposed solar farm and on adjoining habitats to be retained (refer to **Section 8.2**). An Offset Proposal and Offset Management Plan have been prepared for a site on Girrahween Station, ensuring conservation gains consistent with the EPBC Act Environmental Offsets Policy (2012).

Conclusion

The SGP North Solar Farm will deliver a reduction in greenhouse gas emissions associated with gas compression for the SGP North gasfield development and provide local economic and employment benefits. The Project has been designed to maximise the use of areas subject to historical clearing and disturbance through careful site selection and avoidance of remnant vegetation and associated habitats.

An offset area will be secured to compensate for unavoidable significant residual impacts on MNES habitat and potential habitat within the Development footprint in accordance with the *EPBC Act Environmental Offsets Policy* and the offsets assessment guide. The proposed land-based offset will be strategically located to ensure a conservation benefit is achieved through the long-term management and legal security of the offset area as well as contribute to regional biodiversity outcomes for potentially impacted MNES fauna species.

Contents

Executive Summary ii

Abbreviations 1

1. Introduction 4

1.1 Project justification 4

1.2 Project location 5

1.3 Project proponent 5

1.4 Purpose and scope 5

1.4.1 Terminology 5

2. Regulatory Framework 8

2.1 Commonwealth legislation 8

2.1.1 Environment Protection and Biodiversity Conservation Act 1999 8

2.1.2 Native Title Act 1993 9

2.2 Queensland legislation 9

2.2.1 *Environmental Protection Act 1999* 9

2.2.2 Other State legislation 10

3. Description of the Action 12

3.1 Project infrastructure 15

3.1.1 Photovoltaic (PV) array 15

3.1.2 Tracking system 15

3.1.3 Solar panel footings and mounting options 15

3.1.4 Power conversion system 15

3.1.5 Meteorological stations 15

3.1.6 Site access and car parking 16

3.1.7 Temporary construction areas 16

3.1.8 Fencing 16

3.1.9 Asset protection zone 17

3.1.10 Transmission line connection 17

3.2 Project construction 18

3.2.1 Construction stages 18

3.2.2 Construction hours 20

3.2.3 Construction workforce 20

3.3 Project operations 21

3.3.1 Land use and management 21

3.3.2 Operational workforce 21

3.3.3 Hours of operation 21

3.3.4 Maintenance tasks 23

3.3.5 Waste 23

3.4 Decommissioning 23

4. Methodology 24

4.1 Desktop review 24

4.1.1 Likelihood of Occurrence 25

4.2 Field surveys 26

4.2.1 Flora survey effort 26
4.2.2 Fauna survey effort 27
4.2.3 Survey adequacy assessment 31
4.2.4 Habitat Mapping 39
4.2.5 Modified Habitat Quality Assessment Surveys 39

5. Description of the environment 41

5.1 Topography 43
5.2 Geology and soils 43
5.3 Surface and Groundwater 44
5.4 Terrestrial flora 48
5.4.1 Vegetation communities 48
5.4.2 Flora species 51
5.4.3 Weed species 51
5.5 Terrestrial fauna 52
5.5.1 Habitat type and quality 52
5.5.2 Connectivity 54
5.5.3 Fauna assemblages 54

6. Matters of National Environmental Significance 57

6.1 Likelihood of Occurrence Assessment 57
6.2 Population and habitat details for relevant MNES species 69
6.2.1 Corben's long-eared bat, *Nyctophilus corbeni* (Vulnerable) 69
6.2.2 Greater glider, *Petauroides volans* (Endangered) 72
6.2.3 Koala, *Phascolarctos cinereus* (Endangered) 74
6.2.4 South-eastern glossy black-cockatoo, *Calyptorhynchus lathami lathami* (Vulnerable) 79
6.2.5 Squatter pigeon (southern), *Geophaps scripta scripta* (Vulnerable) 80
6.2.6 Diamond Firetail, *Stagonopleura guttata* (Vulnerable) 85
6.2.7 Dunmall's snake, *Furina dunmalli* (Vulnerable) 86
6.3 Possible MNES species that are unlikely to be impacted by the Project 88
6.3.1 Painted honeyeater, *Grantiella picta* (Vulnerable) 88
6.3.2 White-throated needletail, *Hirundapus caudacutus* (Vulnerable and migratory) 88
6.3.3 Fork-tailed swift, *Apus pacificus* (Migratory) 88
6.4 Candidate MNES 89

7. Project Impacts 90

7.1 Potential construction impacts 90
7.1.1 Vegetation clearing and habitat loss 90
7.1.2 Habitat fragmentation and reduced connectivity 92
7.1.3 Fauna injury or mortality 93
7.1.4 Noise and vibration 93
7.1.5 Light emissions 93
7.1.6 Erosion and sedimentation 94
7.1.7 Hazardous materials 94
7.1.8 Pests and weeds 94
7.1.9 Bushfire risk 95
7.2 Potential operational impacts 95
7.2.1 Vehicle strikes 95
7.2.2 Barrier effects and fauna entrapment 96

7.2.3 Noise and light emissions ... 96
7.2.4 Hazardous materials ... 96
7.2.5 Pests and weeds ... 97
7.2.6 Bushfire risk ... 97
7.2.7 Heat island effect ... 97
7.3 Potential decommissioning impacts ... 98
7.3.1 Direct fauna mortality ... 98
7.3.2 Pests and weeds ... 98
7.3.3 Air quality and dust ... 99
7.3.4 Noise and vibration ... 99
7.3.5 Hydrological changes ... 99
7.3.6 Bushfire risk ... 99
7.4 Climate change ... 100
7.5 Facilitated impacts ... 100
7.6 Cumulative impacts ... 100
8. Avoidance, mitigation and management measures ... 104
8.1 Avoidance ... 104
8.2 Mitigation measures ... 106
8.2.1 Construction Phase ... 107
8.2.2 Operations Phase ... 122
8.2.3 Decommissioning Phase ... 126
8.2.4 Site Rehabilitation ... 127
8.2.5 Guidelines and statutory documents relevant to mitigation measures ... 128
8.3 Monitoring ... 142
9. Significant Impact Assessments ... 149
9.1 Corben's long-eared bat (Vulnerable) ... 149
9.2 Greater glider (Endangered) ... 153
9.3 Koala (Endangered) ... 156
9.4 South-eastern glossy black-cockatoo (Vulnerable) ... 160
9.5 Squatter pigeon (southern) (Vulnerable) ... 163
9.6 Diamond firetail (Vulnerable) ... 166
9.7 Dunmall's snake (Vulnerable) ... 168
9.8 MNES Significant Impact assessment conclusion ... 172
10. Proposed offsets ... 173
11. Economic and Social Matters ... 174
11.1 Project costs and benefits ... 174
11.1.1 Employment ... 174
11.2 Stakeholder consultation ... 174
11.2.1 Indigenous engagement ... 175
12. Ecologically Sustainable Development ... 176
13. References ... 177

Appendices

Appendix A Referral decision
Appendix B Reference table
Appendix C Offset Proposal
Appendix D Offset Management Plan
Appendix E Desktop search results
Appendix F Likelihood of occurrence assessment
Appendix G Survey datasheets
Appendix H Species list
Appendix I Arrow Energy HSE Policy
Appendix J Arrow Energy Land Disturbance Guideline
Appendix K Arrow Energy Biosecurity Procedure
Appendix L Arrow Energy Vehicle and Machinery Hygiene Procedure
Appendix M Bushfire Hazard Assessment and Management Plan
Appendix N Cultural Heritage Field Assessment

Figures

Figure 1: Project layout plan iii
Figure 1.1: Project location 6
Figure 1.2: Development footprint 7
Figure 3.1: Proposed action location relative to nearby SGP infrastructure already approved under EPBC 2010/5344 13
Figure 3.2: Project layout plan 14
Figure 3.3: Post-construction land use 22
Figure 4.1: Flora survey effort 29
Figure 4.2: Fauna survey effort 30
Figure 5.1: Land use and infrastructure 42
Figure 5.2: Topography 45
Figure 5.3: Detailed surface geology 45
Figure 5.4: Hydrology 47
Figure 5.5: Regulated Vegetation Management Map 49
Figure 5.6: Ground-truthed Regional Ecosystems 50
Figure 5.7: Biodiversity corridors 55
Figure 6.1: Suitable habitat for the Corben's long-eared bat 71
Figure 6.2: Suitable habitat for the greater glider 75
Figure 6.3: Suitable habitat for the koala 78
Figure 6.4: Suitable foraging habitat for the south-eastern glossy black cockatoo 81
Figure 6.5: Suitable habitat for the squatter pigeon 84
Figure 6.6: Suitable habitat for the Dunmall's snake 87
Figure 7.1: Native vegetation clearing 91

Tables

Table 3.1: Indicative construction schedule 19
Table 4.1: Summary of ecological survey programs undertaken within the Study area 26
Table 4.2: Targeted MNES – Survey Effort (post-2020) within the Study area 32
Table 5.1: Surface geology units 43
Table 5.2: Land Resource Areas 44
Table 5.3: Ground-truthed Regional Ecosystems within the Development footprint 48
Table 5.4: Weed species observed within the Study area. 52
Table 5.5: Introduced fauna species known from the Study area and surrounds 56
Table 6.1: Likelihood of Occurrence Summary 59
Table 6.2: Assessment against criteria defining 'habitat critical for survival' of the greater glider 73
Table 6.3: Assessment against criteria defining 'habitat critical for survival' of the koala 76
Table 6.4: Post-1975 squatter pigeon records within 50 km of the SGP (EcoSmart, October 2024) 82
Table 7.1: Summary of proposed vegetation clearing within the Development footprint 90
Table 7.2: Impacts on habitat for MNES (shading indicates habitat critical to the survival of the species) 92
Table 7.3: Nearby projects with potential cumulative impacts 101
Table 7.4: Potential cumulative impacts to impacted MNES 101
Table 8.1: FSC and unexpected find measures for potentially impacted MNES fauna species 109
Table 8.2: Consistency of proposed mitigation measures with statutory documents 129
Table 8.2: Consistency of proposed mitigation measures with statutory documents 136
Table 8.3: Monitoring program components for EPBC Act species 143
Table 9.1: Assessment of significant residual impacts for the Vulnerable Corben's long-eared bat 149
Table 9.2: Assessment of significant residual impacts for the Endangered greater glider 153
Table 9.3: Preliminary Self-Assessment Factors 156
Table 9.4: Assessment of significant residual impacts for the Endangered koala 157
Table 9.5: Assessment of significant residual impacts for the Vulnerable south-eastern glossy black-cockatoo 160
Table 9.6: Assessment of significant residual impacts for the Vulnerable squatter pigeon (southern) 163
Table 9.7: Assessment of significant residual impacts for the Vulnerable diamond firetail 166
Table 9.8: Assessment of significant residual impacts for the Vulnerable Corben's long-eared bat 169

Plates

Plate 3.1: Typical perimeter fence detail 17
Plate 5.1: Historical imagery of the Project site -1972 (left) and 1984 (right) 41
Plate 5.2: Historical imagery of the Project site – 1992 (left) and 2002 (right) 41
Plate 5.3: Regrowth *Callitris glaucophylla* (RE 11.5.1) with fire damage in August 2023 51
Plate 5.4: Regrowth *Callitris galucophylla* (RE 11.5.1) post-fire in July 2025. 51
Plate 5.5: Remnant RE 11.5.1 with fire damage (immediately north of the Study area) 51
Plate 5.6: Cleared areas with *Callitris glaucophylla* (not impacted by fire) in August 2023 51
Plate 5.7: Regrowth woodland habitat characteristic of the Development footprint 53
Plate 5.8: Rocky gorge with large trees ~100 m south of the Development footprint 53
Plate 5.9: Fire-damaged vegetation adjoining creek line south of the Development footprint 53
Plate 5.10: Pooled water in creek line to the south of Development footprint 53

Abbreviations

AC	Alternating current
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
ALA	Atlas of Living Australia
APZ	Asset Protection Zone
AU	Assessment Units
BESS	Battery Energy Storage System
BVG	Broad Vegetation Group
CEMP	Construction Environmental Management Plan
CSG	Coal seam gas
DBH	Diameter at Breast Height
DC	Direct current
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEMP	Decommissioning Environmental Management Plan
DETSI	Department of Environment, Tourism, Science and Innovation (Qld)
DoR	Department of Resources (Qld)
EA	Environmental Authority
EAR	Ecological Assessment Report
EDL	Ecologically Dominant Layer
EIS	Environmental Impact Statement
EMPs	Environmental Management Plans
EMS	Environmental Management System
EO Act	*Environmental Offsets Act 2014* (Qld)
EO Regulation	Environmental Offsets Regulation
EP Act	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
FCS	Field compression station
FIFO	Fly-in-fly-out
FIN	Fauna Incident Notification
FSC	Fauna spotter-catcher
FTE	Full-time equivalent
GBO	General Biosecurity Obligation

GDEs	Groundwater Dependent Ecosystems
GHG	Greenhouse Gas
GTRE	Ground-truthed Regional Ecosystem
HPF	Hybrid power facility
HQS	Habitat Quality Scores
HSE	Health, Safety and Environment
IECA	International Erosion Control Association
IVMS	In-Vehicle Monitoring System
JSEA	Job Safety and Environmental Analysis
KoRV	Koala Retrovirus
kV	Kilovolt
LGA	Local Government Area
LoO	Likelihood of Occurrence
LRAs	Land Resource Areas
MHQA	Modified Habitat Quality Assessments
MNES	Matters of National Environmental Significance (Commonwealth)
MSES	Matter of State Environmental Significance (Qld)
MW	Megawatt
MWp	Megawatt peak
NEPA	National Environmental Protection Agency
NC Act	*Nature Conservation Act 1992* (Qld)
NT Act	*Native Title Act 1993* (Commonwealth)
OEMP	Operation Environmental Management Plan
PBDF	Psittacine Beak and Feather Disease
PCS	Power Conversion Station
PD	Preliminary Documentation
PMST	Protected Matters Search Tool
PPE	Personal Protection Equipment
PV	Photovoltaic
REs	Regional Ecosystems
RFI	Request for Further Information
RVMM	Regulated Vegetation Management Map
SARA	State Assessment and Referral Agency
SAT	Spot Assessment Technique
SCADA	Solar Farm Supervisory Control and Data Acquisition
SDAP	State Development Assessment Provisions
SGP	Surat Gas Project

SIA	Significant Impact Assessment
SIMP	Species Impact Management Plan
SMP	Stormwater Management Plan
SPC	Soil Profile Classes
SPRAT	Species Profiles and Threats Database
TECs	Threatened Ecological Communities
VM Act	*Vegetation Management Act 1999* (Qld)
WoNS	Weeds of National Significance
WPMP	Weed and Pest Management Plan or Weed and Pest Management section within the CEMP or OEMP

1. Introduction

Arrow CSG Australia Pty Ltd (Arrow CSG) is proposing to develop the Surat Gas Project (SGP) North Solar Farm (the Project) on land at Retreat Road, Kowguran approximately 18 km north of Miles (refer to **Figure 1.1**). The Project will supply renewable electricity to a planned hybrid power facility (HPF) being developed to power the SGP North Field Compression Station (FCS) and is a key initiative in Arrow Energy's plans to reduce greenhouse gas emissions and meet net zero targets.

The proposed solar farm will be located on Lot 17 on Plan AU199 (the Project site). The proposed HPF will comprise gas reciprocating engines (up to 24.5 MW), a battery energy storage system (BESS) (up to 8.78 MVA capacity) and associated infrastructure to be located on the adjoining property to the south (Lot 16 on Plan AU38). The solar farm will be connected to the main power facility via an 11 kV transmission line which will be incorporated into corridors cleared for the gas gathering network for the majority of its length. Site access will be gained from Retreat Road via internal access roads to be developed by Arrow Energy across Lot 16 on Plan AU38.

The HPF and FCS are part of the broader Surat Gas Project (SGP) which has previously been assessed and approved under the:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) with approval (EPBC 2010/5344) granted on 19 December 2013; and
- Queensland *Environmental Protection Act 1994* (EP Act), with the Environmental Authority (EA001399) as amended on 28 January 2026.

The transmission line and solar farm access road required for the Project will also be developed under the abovementioned approvals. However, the SGP North Solar Farm is being developed separately to Arrow CSG's coal seam gas network and it is intended that the solar farm will be operated by a third-party provider.

As such, the Project was referred separately to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (now the National Environmental Protection Agency (NEPA)) on 11 September 2024 for consideration of its impacts on Matters of National Environmental Significance (MNES) protected under the EPBC Act (EPBC 2024/10002).

On 17 February 2025, DCCEEW determined the Project to be a 'controlled action' requiring assessment and approval by Preliminary Documentation (PD) in accordance with Part 8, Division 4 of the EPBC Act (refer to **Appendix A**).

The controlling provisions are listed threatened species and communities (section 18 and 18A of the EPBC Act).

1.1 Project justification

The HPF provides the lowest greenhouse gas emissions intensity available development, which is forecasted as:

- 41% less than the emissions intensity from the current Queensland electricity grid, and
- 23% less than the prescribed emissions intensity for electricity generation by the Safeguard Mechanism[2].

The potential for the Project to generate up to 17 MWp of solar power significantly reduces Arrow Energy's reliance on fossil fuels for electricity by changing the primary energy source to solar energy and is estimated to result in potential emissions abatement of 21,000 $tCO2_{-e}$ per annum. The Project has been sited and designed to minimise community impact. In addition, Arrow CSG as the landowner removes the risk of disruption to landowners from construction activities.

The Project is consistent with and supports the Queensland Government's commitments and priorities, including bolstering an affordable, reliable and sustainable energy system. Specific benefits of the Project include:

- Approximately 50 jobs are expected to be generated during the 12-month construction period and up to eight direct and indirect jobs during operation
- Investment is expected in the local region during the construction period. Arrow CSG is committed to maximising opportunities for local workers and businesses.

[2] The Safeguard Mechanism is the Australian Government's policy for reducing emissions at Australia's largest industrial facilities.

1.2 Project location

The Project is located on land formally described as Lot 17 on Plan AU199 (the Project site) approximately 18 km north-east of Miles and 2 km south-west of Barakula State Forest within the Western Downs local government area (LGA) (refer to **Figure 1.1**). This property is one of four land parcels that make up Girrahween Station which is owned by Arrow (Tipton Two) Pty Ltd (a subsidiary company of Arrow CSG). Girrahween Station was purchased in 2012 and is currently being developed as part of Arrow CSG's SGP North gasfields.

The Project will be located on the western side of Lot 17 on Plan AU199 and separated from the rest of the lot by two existing gas pipeline easements with a combined cleared width of approximately 70 m (PPL153[3] and PPL163[4]). It contains non-remnant native vegetation that has been subject to historical clearing and grazing facilities in a predominantly rural landscape.

1.3 Project proponent

The Person proposing to take the action is Arrow CSG (Australia) Pty Ltd. There have been no Commonwealth or State environmental proceedings brought against Arrow CSG.

1.4 Purpose and scope

On 15 March 2025, DCCEEW issued a request for further information (RFI) pursuant to section 95A(2) of the EPBC Act outlining the information to be provided in the PD. This document compiles information from the original referral and additional information gathered specifically in response to the RFI to:

- enable interested stakeholders to understand the environmental consequences of the Project on MNES; and
- support a decision by the Minister about whether to approve the Project under Part 9 of the EPBC Act.

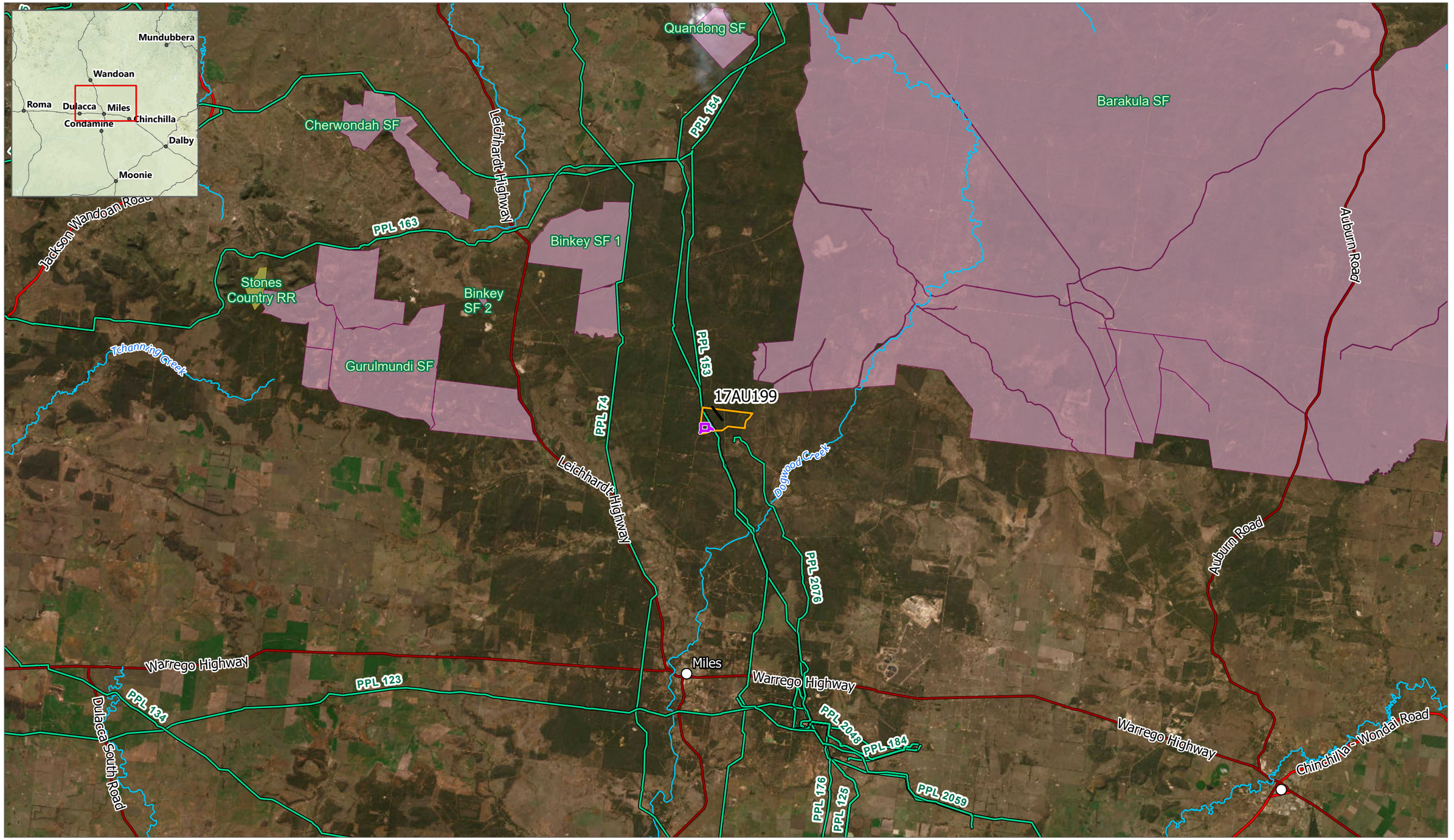
A reference table indicating where information required by the RFI can be found within the PD is provided in **Appendix B**.

1.4.1 Terminology

The following terms have been adopted and used throughout the PD:

- **Project** or **Action**– refers to the proposed SGP North Solar Farm infrastructure to be developed on Lot 17on Plan AU199 as described in **Section 3** of this PD.
- **Surat Gas Project** – refers to Arrow CSG's approved gasfield project currently being developed under EPBC Approval 2010/5344.
- **Project site** – refers to the land formally described as Lot 17on Plan AU199 on which the solar farm infrastructure will be developed.
- **Development footprint** – refers to the area directly impacted for the development of Project infrastructure described in **Section 3** (approximately 30.1 ha)(refer to **Figure 1.2**). The Development footprint presented in this PD represents a change to the proposal as originally assessed in the EPBC Referral which considered the impacts of clearing across a larger area (61.9 ha).
- **Project area** –the same 30.1 ha area and means the same as 'Development footprint'. The term 'Project area' is used in this report in reference to the operational and decommissioning phases of the Project.
- **Study area** – refers to the area for which the ecological investigations (as illustrated and discussed in **Section 4.2**) have been undertaken for the Project. The Study area includes the Development footprint as well as immediately adjoining vegetation / habitat up to the nearest existing cleared corridor/access road/boundary.

[3] The authorised holder for PPL153 is APA WGP Pty Ltd.
[4] The authorised holder for PPL163 is Australia Pacific LNG Gladstone Pipeline Pty Ltd



- Population Centres
- Highway
- Main Road
- Watercourse
- Granted Petroleum Pipeline Licences Centreline
- Development Footprint
- Project Site

Protected areas and forests of Queensland:

- Resources Reserve
- State Forest

SGP NORTH SOLAR FARM
Project Location

Figure 1.1

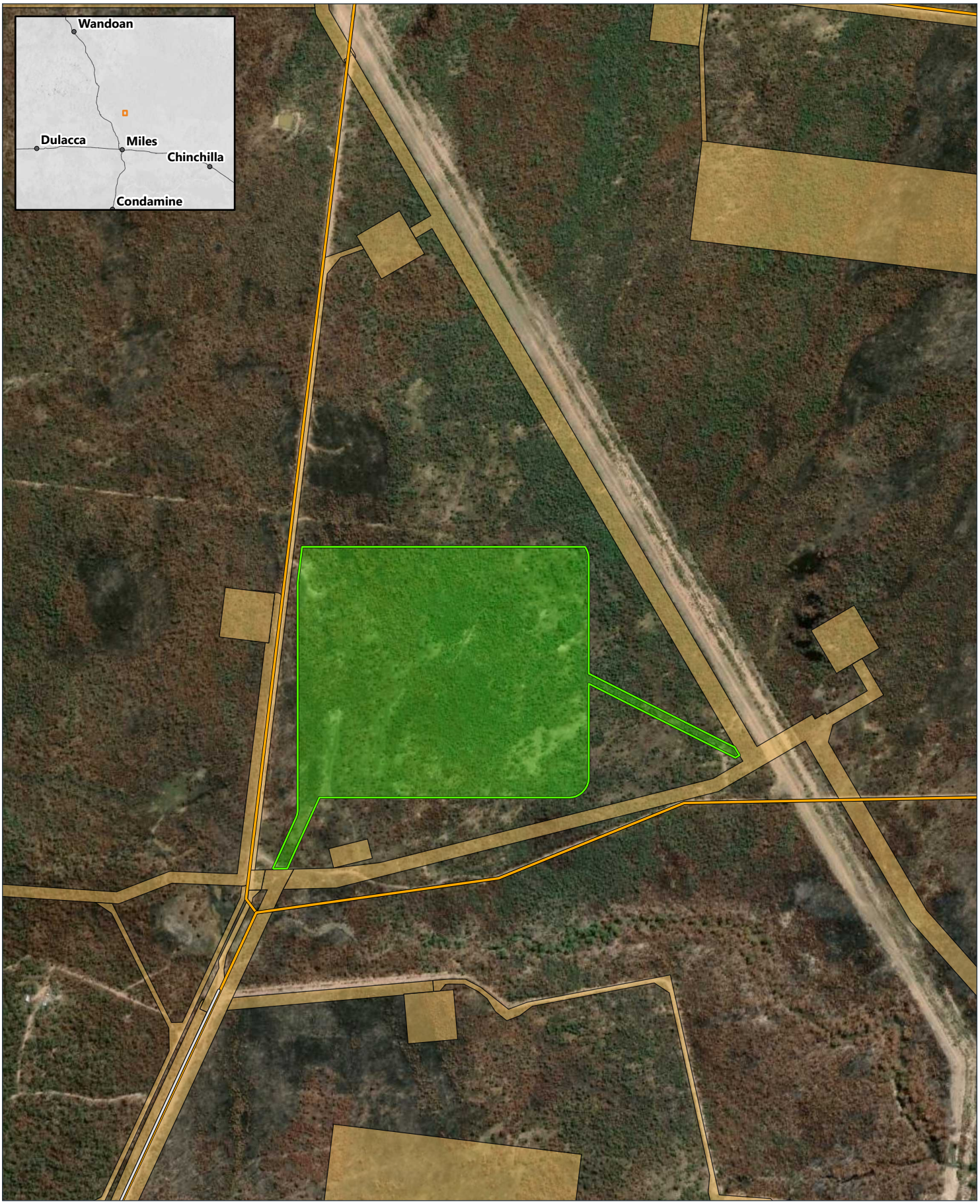
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Development Footprint

Figure 1.2

Highway
Main Road
Access Track
Development Footprint
SGP North Approved Infrastructure

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2. Regulatory Framework

2.1 Commonwealth legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the Australian Government's central piece of environmental legislation that provides a legal framework to protect and manage MNES, many of which are also internationally important. If a proposed development or other action is likely to have a significant impact on a protected matter under the EPBC Act, then it must be referred to the Australian Federal Government for assessment.

The EPBC Act covers the following nine (9) protected matters:

- World heritage areas;
- National heritage places;
- Wetlands of international importance (as listed under the Ramsar Convention);
- Listed threatened species and ecological communities;
- Listed migratory species (protected under international agreements);
- Commonwealth marine areas;
- Great Barrier Reef Marine Park;
- nuclear actions (including uranium mines); and
- Water resources (that relate to coal seam gas development and large coal mining development).

The EPBC Act also protects the environment when actions are taken:

- On Commonwealth land or impact upon Commonwealth land;
- By an Australian Government agency anywhere in the world; and
- That impact Commonwealth heritage places overseas.

Arrow CSG has an existing approval under the EPBC Act (EPBC 2010/5344) for the broader SGP[5] area of which the area of the Development footprint forms a part. However, because the solar farm component is a discrete commercial component a decision has been taken to seek separate approval for the Project under the EPBC Act.

The Project was referred to the DCCEEW on 11 September 2024 (EPBC 2024/10002) and determined to be a controlled action requiring assessment and approval by PD on 17 February 2025.

The controlling provisions are listed threatened species and communities (section 18 and 18A of the EPBC Act).

2.1.1.1 Significant Impact Guidelines

Under the EPBC Act a 'controlled action' is an action that the Minister decides have, will have, or is likely to have a significant impact[6] on a MNES and will require approval from the Minister. The *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (DoE 2013) (the guidelines) provide detailed criteria to determine whether or not a proposed action may have a significant impact on MNES. Thresholds provided in the guidelines vary according to the threat status of the MNES.

The guidelines have been applied to the impact assessments undertaken for listed threatened species considered likely to occur in the Project site to determine whether the Project is likely to have a significant impact on MNES (refer to **Section 9**). Where the Project has been assessed has having a significant impact on a particular MNES, offsets have been proposed in accordance with the EPBC Act Environmental Offsets Policy (DSEWPC, 2012).

[5] The broader SGP area has a combined extent of 206,594 ha and includes a southern, central (53,048 ha and contains the Project site) and northern area.
[6] A 'significant impact' is an impact which is important, notable or of consequence, having regard to its context or intensity.

2.1.1.2 EPBC Act Environmental Offset Policy

Environmental offsets are required to be delivered in accordance with the EPBC Act Environmental Offsets Policy (DSEWPC 2012). The Environmental Offsets Policy outlines the Australian Government's approach to the use of environmental offsets under the EPBC Act. Offsets are defined as measures that compensate for the residual adverse impacts of an action on the environment. The mitigation hierarchy requires that avoidance, minimisation and mitigation measures are the primary strategies for managing the potential significant impacts of a proposed action. Offsets do not reduce the likely impacts of a proposed action but instead compensate for any significant residual impact after the avoidance, minimisation and mitigation strategies have been applied.

Where significant residual impacts are found to occur to MNES, the Policy requires the provision of an offsets package for the Project. An offsets package is a suite of actions that a proponent undertakes in order to compensate for the significant residual impacts to the identified MNES. It can comprise a combination of direct offsets and other compensatory measures. Offsets should align with conservation priorities for the impacted protected matter and be tailored specifically to the attribute of the protected matter that is impacted, in order to deliver a conservation gain.

While care has been taken to avoid impacts through appropriate site selection, minimisation of impacts on habitat and the adoption of mitigation strategies through the construction and operation of the Project, residual significant impacts on habitat for MNES species will occur as a result of the Project. As such, it is proposed to provide an offset for impacted MNES species habitat in accordance with the Policy.

An Offset Proposal and Offset Management Plan have been prepared for the Project and are presented as **Appendix C** and **Appendix D** respectively.

2.1.1.3 The 'water trigger'

Under the EPBC Act, an action which involves a coal seam gas (CSG) development requires approval if the action has, will have, or is likely to have a significant impact on a water resource. Whether a particular action can be described as involving a CSG development will be determined based on whether that action is so closely associated with the extraction of CSG or the mining of coal as to be integral to that extraction or mining (as relevant).

The Project does not trigger MNES water resource assessment under the EPBC Act as it is not integral to CSG extraction.

2.1.2 Native Title Act 1993

The Commonwealth Native Title Act 1993 (NT Act) recognises the rights and interests of Indigenous peoples in response of the land on which they have historically resided and regulates 'future acts' including development. The Commonwealth NT Act requires parties to notify native title parties where a proponent seeks to undertake a 'future act'. Further details of consultation with the registered Native Title claimants for the land containing Development footprint, the Iman People #4, is provided in **Section 11.2.1**.

2.2 Queensland legislation

2.2.1 *Environmental Protection Act 1999*

The primary approval for the SGP North Project (including the solar farm, HPF and other associated infrastructure) at the State level is the Environmental Authority (EA0001399) issued under Queensland's *Environmental Protection Act 1994* (the EP Act). The assessment under the EP Act was undertaken via an Environmental Impact Statement (EIS) for the broader SGP which was originally published in 2012.

Environmental assessments relevant to the proposed action are outlined in **Section 4** and include the:

- Surat Gas Project Environmental Impact Statement (2012); and
- Surat Gas Project Supplementary Environmental Impact Statement (2013).
- Detailed flora and fauna assessments carried out as part of Project development activities (EcoSmart, 2016-17).
- Pre-clearance surveys carried out by Arrow Energy ecologists.

This includes consideration of impacts on biodiversity values including 'prescribed environmental matters' under the *Environmental Offsets Act 2014* (EO Act)(refer to **Section 2.2.2.3**).

2.2.2 Other State legislation

2.2.2.1 Aboriginal Cultural Heritage Act 2003

The *Aboriginal Cultural Heritage Act 2003* (ACH Act) is the primary legislation governing Aboriginal Cultural Heritage in Queensland. The ACH Act requires developers to identify reasonable and practicable measures for ensuring Project activities are managed to avoid or minimise harm to Aboriginal cultural heritage in a way that meets duty of care requirements under Section 23 of the ACH Act.

The Cultural Heritage Duty of Care Guidelines provide guidance in determining whether a person or activity complies with the cultural heritage duty of care. These guidelines recognise that it is unlikely that Aboriginal cultural heritage will be harmed where:

- the activity is in an area previously subjected to significant ground disturbance and the activity will impact only on the area subject to the previous ground disturbance; or
- the impact of the activity is unlikely to cause any additional harm to Aboriginal cultural heritage than that that has already occurred.

Information regarding cultural heritage assessments for the Project is provided in **Section 11.2.1**.

2.2.2.2 Biosecurity Act 2014

The *Biosecurity Act 2014* (the Biosecurity Act) provides a legislative framework to manage pest flora and fauna species, diseases, and environmental contaminants, and to address the impact they have on the economy, environment, agriculture and tourism industries, and society. The Biosecurity Act prohibits or restricts the introduction and spread of declared plant and animal pest species within Queensland. Under the Biosecurity Act, all individuals and organisations have a General Biosecurity Obligation (GBO) to manage biosecurity risks that are under their control and that they should reasonably know about.

Pest plants and animals will be managed for the Project in accordance with Arrow Energy's *Biosecurity Procedure* (ORG-ARW-HSM-PRO-000187). This procedure outlines the measures to be undertaken by Arrow CSG to comply with regulatory obligations by managing the impact and spread of biosecurity matter at Arrow CSG's work sites, and applies to all Arrow CSG's employees and contractors engaged directly or indirectly by it, including visitors. The Arrow Energy *Biosecurity Guideline* (ORG-ARW-HSEM-GUI-00123) is a supporting document to be used in conjunction with the Biosecurity Procedure when managing biosecurity matter.

2.2.2.3 Environmental Offsets Act 2014

Under the Queensland Environmental Offsets Framework implemented by Queensland's *Environmental Offsets Act 2014* (EO Act), an environmental offset is required where a significant residual impact occurs to a Matter of State Environmental Significance (MSES). MSES are prescribed in Schedule 2 of the *Environmental Offsets Regulation* (EO Regulation) which includes:

- areas of habitat for animals that are listed as endangered or vulnerable under the Queensland *Nature Conservation Act 1992* (NC Act) including koala, greater glider, Corben's long-eared bat, diamond firetail, glossy black cockatoo and painted honeyeater;
- vegetation communities listed as 'endangered' or 'of concern' Regional Ecosystem types under Queensland's *Vegetation Management Act 1999* (VM Act);
- essential habitat (as mapped by DETSI);
- an area that contains plants that are listed as endangered or vulnerable wildlife under the NC Act;
- regulated vegetation that intersects with watercourses and wetlands;
- connectivity values;
- wetlands of high ecological significance;

- protected areas (including nature refuges);
- declared fish habitat areas and waterways providing for fish passage; and
- legally secured offset areas.

Within the EA process under the EP Act, significant residual impacts on MSES are authorised via their inclusion in *Schedule F, Table 3 – Significant residual impacts to prescribed environmental matters*.

2.2.2.4 Nature Conservation Act 1992

The NC Act provides for the gazettal of protected areas including nature refuges, prescribes classes of wildlife and sets out restrictions on the taking or harm to native wildlife or disturbing animal breeding places without a valid permit. Classes of wildlife recognised under the NC Act include:

- Extinct in the wild
- Critically endangered
- Endangered
- Vulnerable
- Near threatened
- Special least concern.

The NC Act also establishes a Protected Plants Framework which requires a proponent to complete a flora survey in areas mapped as high risk on the Flora Survey Trigger Map prior to any clearing. Pre-clearance surveys are typically undertaken within the 12 months prior to construction commencement to support an application for a clearing permit under the NC Act. Restrictions on clearing or taking protected wildlife or interfering with breeding habitat will apply to the Project regardless of the primary approvals pathway followed.

2.2.2.5 Vegetation Management Act 1999

The *Vegetation Management Act 1999* (VM Act) aims to regulate the clearing of native vegetation in a way that conserves remnant vegetation in declared areas, ensures the clearing does not cause land degradation, prevents the loss of biodiversity, maintains ecological processes, manages the environmental effects of the clearing, reduces greenhouse gas emissions, and allows for sustainable land use.

Under the VM Act, vegetation communities, which are known in Queensland as Regional Ecosystems (REs), are assigned to one of three classes. These classes are known as the VM Class and are:

- Endangered RE – less than 10% of the pre-clearing extent of a particular community remains across a given bioregion; or 10-30% of the pre-clearing extent remains and the remnant area is less than 10,000 ha;
- Of concern RE – 10-30% of the pre-clearing extent of a particular community remains across a given bioregion; or more than 30% of the pre-clearing extent remains and the remnant area is less than 10,000 ha; and
- Least concern RE – more than 30% of the pre-clearing extent of a particular community remains across a given bioregion, and the remnant area is greater than 10,000 ha.

Clearing of vegetation in areas mapped as Category X is exempt under the VM Act and no approval is required. As such, no State approvals under the VM Act are required for clearing of vegetation for the solar farm.

3. Description of the Action

The proposed action involves the construction, operation and decommissioning of a 17 megawatt peak (MWp) capacity solar farm comprising:

- Approximately 30,000 individual solar panels on single axis tracker mounting systems;
- Four (4) modular power conversion system (PCS) container units enclosing inverters, transformers and switchgear;
- Approximately 355 m of the 11 kilovolt (kV) transmission connection (either underground or overhead cabling to be determined during detailed design);
- Underground cabling connecting solar arrays ('strings') to inverter stations;
- Two meteorological stations for recording meteorological data to track performance and monitor Project site conditions;
- Two construction laydown areas, a construction carpark and water storage tank;
- Internal boundary fire trail and asset protection zone (APZ)
- Perimeter access track including connection to the internal access road network being developed on Girrahween Station as part of the broader SGP North gasfield development (approximately 1.7 km total track length); and
- Perimeter fencing comprising an approximately 1.8 m tall fauna exclusion floppy top chain link fence based on best-practice fencing guidelines including the Queensland Department of Transport and Main Roads (DTMR 2025) Fauna Exclusion Fencing Standards. No barbed wire will be used in the fence.

The 'Development footprint' is 30.1 ha. This represents the maximum area required for the solar farm infrastructure. The action does not include the following which have been designed to align with the gas gathering network being developed under Arrow Energy's existing EPBC approval for the SGP (EPBC 2010/5344):

- the main site access from Retreat Road and internal access road network being developed to facilitate access to production facilities elsewhere on Girrahween Station (refer **Section 3.1.7**); and
- the balance of the 11 kV transmission line from the Development footprint boundary to the FCS and hybrid power station on Lot 16AU38.

The proposed action and its relationship to other elements of the SGP already approved under EPBC 2010/5344 are shown in **Figure 3.1**. Nearby SGP North infrastructure already approved under EPBC 2010/5344 includes gas wells and gathering lines plus the following:

- two (2) proposed quarry options;
- a field compression station;
- a water transfer station;
- mobile drilling camps;
- a logistics hub facility; and
- a proposed camp site.

The layout of the proposed infrastructure that is the subject of this current approval application (EPBC 2024/10002) is illustrated in **Figure 3.2**.

Proposed Quarry Option 1

17AU199

Weather Station

Weather Station

Proposed HV Connection Tie-in Point

Fence Gate

Access Track Tie-in Point

Proposed Quarry Option 2

Water Transfer Station

Field Compression Station

Mobile Drill Camp

16AU38

Bottle Tree Creek

Main Site Entrance

Logistical hub facility

Proposed Camp Site

Laydown

Retreat Road

Retreat Road

Wandoan

Dulacca

Miles

Chinchilla

Condamine

Proposed Action (within Development Footprint):

- Fence Gate
- Main Site Entrance
- Access Track Tie-in Point
- Proposed HV Connection Tie-in Point
- Weather Station
- 11kV Connection
- Solar Farm Internal Access Tracks
- Development Footprint

Not Included In Action:

- Watercourse
- Local Road
- 11kV Connection (Outside Footprint)
- SGP North Approved Infrastructure
- Site access from Retreat Road
- Base Type Parcel

SGP NORTH SOLAR FARM

Proposed action location relative to nearby SGP infrastructure already approved under EPBC 2010/53445344

Figure 3.1

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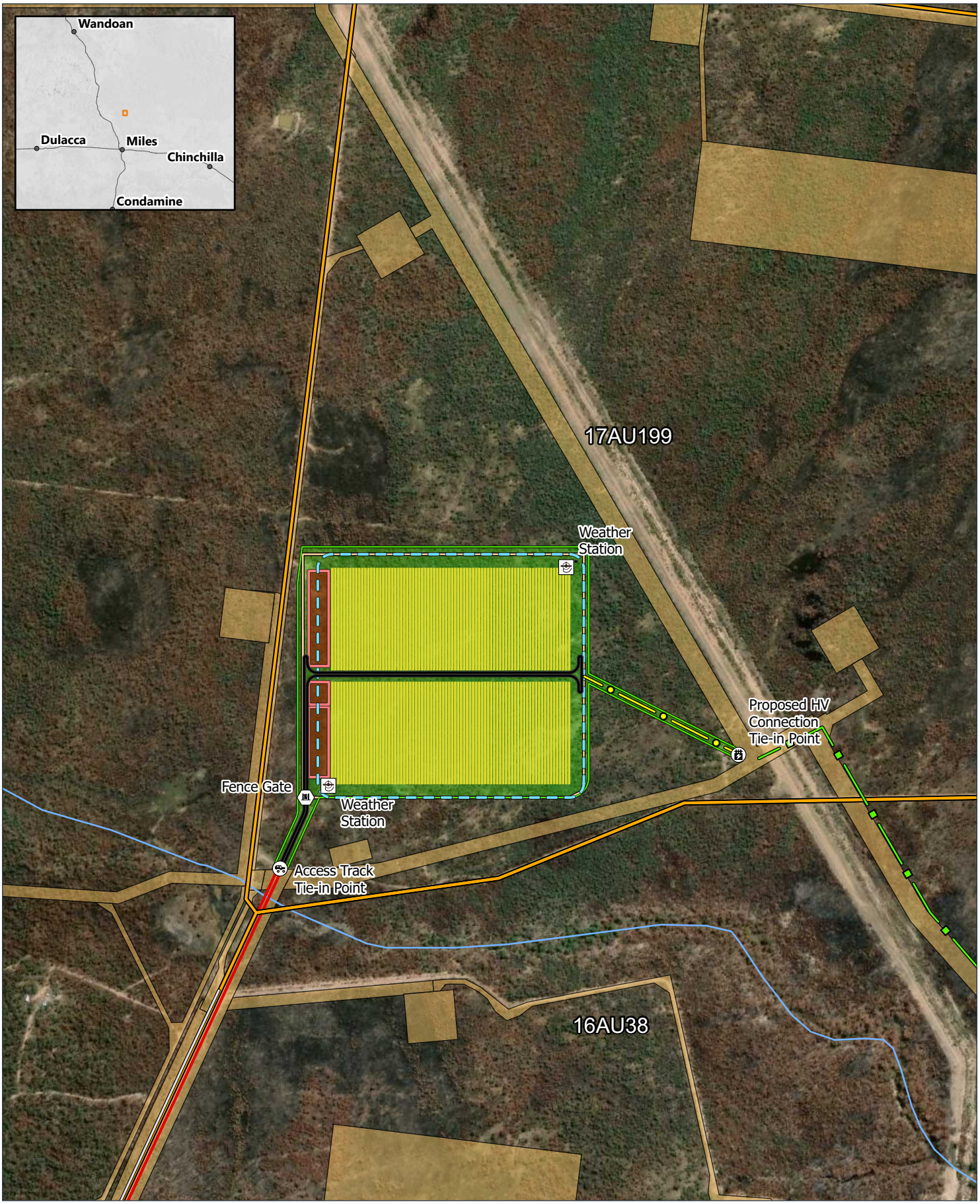
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Project Layout Plan

Figure 3.2

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Proposed Action (within Development Footprint):

- Fence Gate
- Access Track Tie-in Point
- Proposed HV Connection Tie-in Point
- Weather Station
- Solar Panels
- Fenceline
- Solar Farm Internal Access Tracks
- 11kV Connection
- Asset Protection Zone
- Development Footprint
- Temporary Construction Areas

Not Included In Action:

- Watercourse
- Access Track
- 11kV connection (Outside Footprint)
- Project Site
- SGP North - Internal Access Road Network
- SGP North Approved Infrastructure

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3.1 Project infrastructure

3.1.1 Photovoltaic (PV) array

The PV array will cover the majority of the Development footprint comprising an area of approximately 21 ha. The number of rows of PV panels within the array depends on the specific module model chosen, and configuration of the subarrays or "blocks" and will be finalised during detailed design. The panels will be mounted on a tracking system and separated into rows with enough physical space to allow access between modules for maintenance purposes and to avoid shading issues. The blocks of PV panels are connected via underground cabling to modular PCS's, with each block connected to a PCS. The modules convert incident photons into electric current and are the principal power generating part of the facility.

3.1.2 Tracking system

The tracking systems, or trackers, will rotate the rows of PV panels from east to west each day to ensure optimal exposure to the sun. The tracking system will be designed and constructed in accordance with the Australian Standards, and from the ground to the tip of the PV panels at their maximum tilt angle the panels will have an approximate maximum height of 4 m. The final tracking system supplier and model will be selected during financial close.

3.1.3 Solar panel footings and mounting options

The solar tracking system will be mounted on piers either directly pile driven into the ground or into a predrilled hole secured with stabilising sand. The piers vary in size as heavy piers are used for the exterior and motor trackers to account for wind loading. There will be approximately 3,750 piers. Final pier design and quantum is subject to further design.

3.1.4 Power conversion system

The energy generated by the PV modules will be converted from direct current (DC) to alternating current (AC) energy by the inverters housed within the modular PCS container units. These units will also include integrated transformers to increase the voltage to medium levels. The PCSs will be housed either in standard 40-foot shipping containers or in small (approximately 12 m by 8 m) buildings. The exact type and number of PCS' that will be required for the Project will not be finalised until the detailed design phase, which will determine the electricity generating capacity of the facility.

The inverters will be connected via a network of underground medium voltage cables (11 kV). The cables reticulate AC current to all three inverters. The final buried cable depth will be subject to detailed design. However, the likely buried depth is 600 mm.

3.1.5 Meteorological stations

Two (2) meteorological stations will be installed on site to monitor local climatic conditions and for performance monitoring. These stations will monitor:

- Horizontal irradiation
- Incident irradiation
- Diffuse irradiation
- Solar radiation flux density
- Wind speed
- Rainfall
- Ambient temperature
- Reference cell temperature.

All data streams from the meteorological stations will be collected and retained by the Solar Farm Supervisory Control and Data Acquisition (SCADA) system at the FCS. Additional anemometers will be situation around the site perimeter to measure prevalent and gusting wind speeds. In the event of extreme wind events, the SCADA system will instruct the trackers to move into stow position to avoid system damage. All cabling will be co-located with cables for the transmission line and gas gathering corridors.

3.1.6 Site access and car parking

Site access to the Project from Retreat Road will be gained via Lot Plan 16AU38 using internal access roads being developed as part of the broader SGP North development (the 'primary' access road network). These access roads coincide with approved clearing for the gas gathering network authorised under EPBC 2010/5344 (as shown on **Figure 3.1**). Construction of the primary internal access road network will be completed prior to the commencement of Project construction in Q3/Q4 2026 and does not form part of the Project.

The Project does incorporate a perimeter access track and access connection (approximately 1.7 km in length) to the primary access road network as shown on **Figure 3.2**. An informal temporary parking area will be available during construction and may also be utilised during operation (refer **Section 3.1.7**).

3.1.7 Temporary construction areas

Two (2) temporary construction areas will be required for materials storage (of solar panels, piles, tracking systems etc), plant and equipment comprising:

- Two construction laydown areas (both approximately 0.6 ha in size); and
- parking and ancillaries (water tank) (approximately 0.2 ha in size).

These temporary construction areas will be maintained during the operational phase for their use during routine maintenance activities.

Construction activities that have the potential to cause ignition (e.g. the use of machinery and power tools that could throw sparks or generate heat and smoking) will occur within the area protected by the APZ.

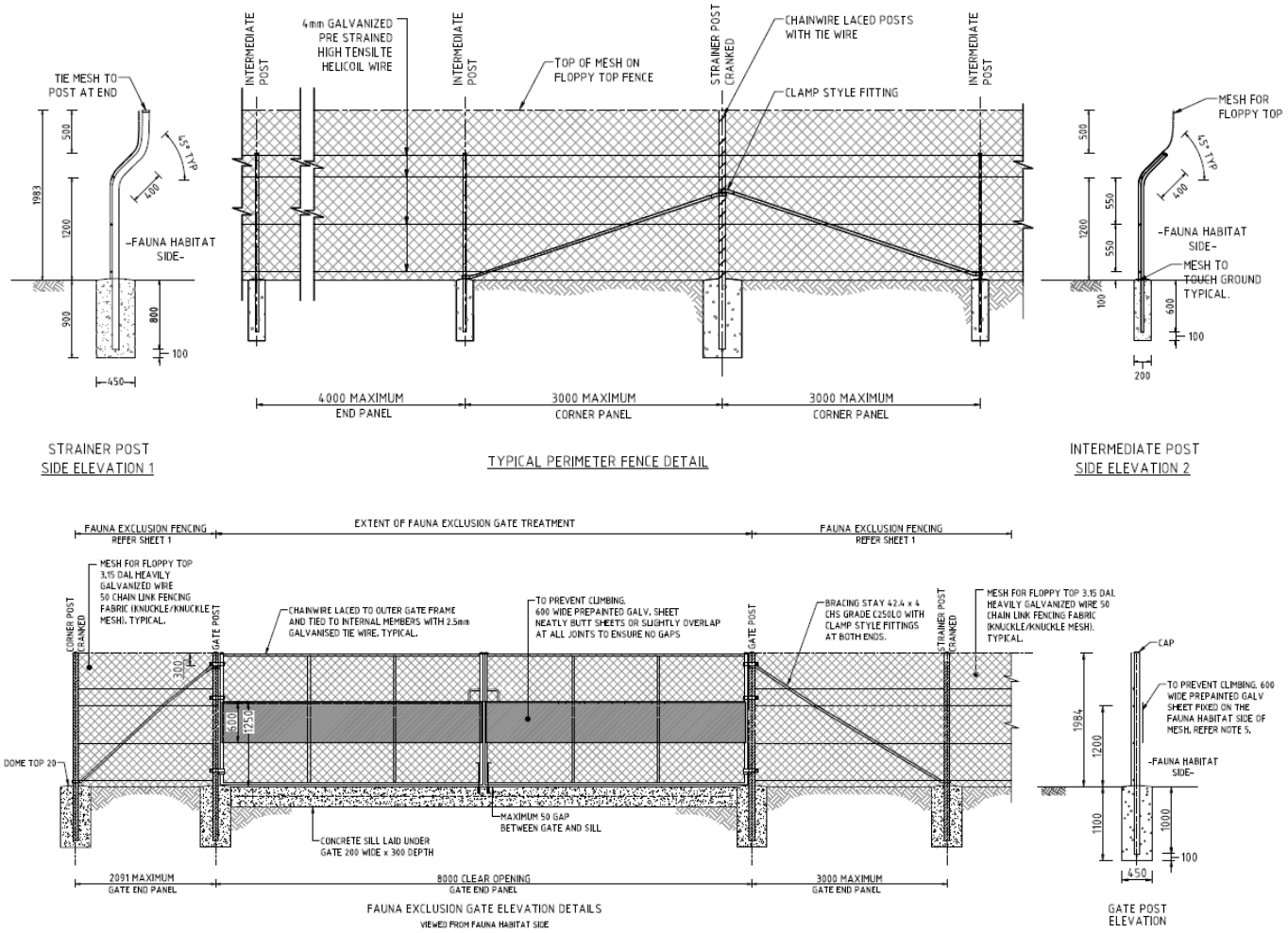
3.1.8 Fencing

Permanent exclusion fencing will also be erected around solar farm infrastructure for the life of the Project for operational safety and security purposes. The proposed fence comprises an approximately 1.8 m tall fauna exclusion floppy top chain link fence based on best-practice fencing guidelines including the Queensland DTMR (2025) Fauna Exclusion Fencing Standards. The top of the fence will include approximately 400 mm of mesh installed at a 45° slope plus an additional 500 mm of floppy mesh. The sloped and floppy parts will 'flop'/hang outwards (so that koala, greater glider and other fauna are prevented from climbing into the solar farm, but an individual could more easily climb out if there was ever inadvertent entry into the farm). No barbed wire will be used in the fence.

It is recognised that vegetation clearing required prior to construction of this fence poses a high risk of koala injury. The risk associated with vegetation clearing prior to fence construction will be managed through non-fence based controls as detailed in **Section 8.2.1** (including the use of fauna spotter-catchers and the specific koala habitat clearing measures presented in **Section 8.2.1.2**). These measures are in accordance with the Queensland Government's *Information Sheet – Nature Conservation (Koala) Conservation Plan 2017 – Koala Conservation Plan clearing* requirements (DES 2021) designed for the purposed of minimising the risk of mortalities, injuries and stress to individual koalas during clearing activities.

Perimeter fencing will be installed at the start of the construction phase and retained for the life of the Project. The location of proposed fences is shown in **Figure 3.2** with the fence detail shown in **Plate 3.1**.

Plate 3.1: Typical perimeter fence detail



3.1.9 Asset protection zone

The proposed Action incorporates a 28 m-wide APZ around the edge of the PV array. The APZ is designed to limit radiant heat to 10 kW/m^2 upper limit exposure as required by the Queensland Fire Department (QFD) and will:

- minimise the risk to the solar panels and other infrastructure associated with uncontrolled bushfire; and
- limit interactions of potential solar farm ignitions associated with adjoining areas of bushfire-prone native vegetation.

The APZ will be cleared at the beginning of the construction phase and will be maintained as a grass strip for the life of the Project. Perimeter roads around the facility will be located within the cleared APZ to minimise additional clearing. The total area required to be cleared for the APZ is approximately 5.3 ha.

3.1.10 Transmission line connection

The Project incorporates approximately 355 m of the 11 kV transmission line connecting the solar farm to the HPF which will be constructed, owned and operated by a third party under contract to Arrow Energy. The transmission line will be constructed within an 18 m wide corridor which will be adequate to accommodate the required clearances for the overhead transmission line with a decision on whether to construct an overhead or underground line to be finalised during detailed design.

The impacts of the transmission connection on MNES values outside the Development footprint were considered as part of the assessment of the broader SGP North development and approved under EPBC 2010/5344.

3.2 Project construction

Development of Girrahween Station as part of the SGP commenced in December 2024 with the construction of the access road network/gas gathering expected to be complete by the time construction of the solar farm, which is the subject of this PD, commences in Q3 2026.

Construction of the solar farm is expected to take around 10-12 months to complete. The main construction stages are outlined in **Section 3.2.1** however, many of the construction activities will overlap as shown in **Table 3.1**.

3.2.1 Construction stages

3.2.1.1 Pre-construction

Pre-construction activities will include:

- Detailed design of the Project and related infrastructure.
- Procurement of:
  - all necessary equipment, materials and infrastructure. This will include mobilisation of solar farm components such as panels
  - awarding of sub-contracts for the different packages of work
  - procurement of longer lead items will continue throughout the Project.
- Geotechnical investigations. In the event that limited clearing for geotechnical investigations is required to facilitate access, a separate self-assessment of impacts on MNES can be completed prior to these works proceeding to ensure no significant impact on MNES and made available to NEPA as required. This limited clearing, where required, can also be authorised under the current SGP North Environmental Authority EA0001399
- Development of Construction Environmental Management Plan (inclusive of stormwater management and chemical pollution management sections and mitigation measures).

Any pre-construction and investigative works do not form part of the action. Impact assessments for pre-construction works will be considered separately to the Project.

Table 3.1: Indicative construction schedule

	Construction Task	Duration (months)	Month															
			July 2026	August 2026	September 2026	October 2026	November 2026	December 2026	January 2027	February 2027	March 2027	April 2027	May 2027	June 2027	July 2027	August 2027	September 2027	October 2027	November 2027
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
			Q3 2026		Q4 2026			Q1 2027			Q2 2027			Q3 2027			Q4 2027		
A	Personnel and site facilities mobilisation	5																	
B	Survey and mark area to be cleared	0.2																	
C	Vegetation clearing and removal	2																	
D	Install solar farm fencing	1																	
E	PV tracker pile installation	2																	
F	Trenching and cable installation	2																	
G	PV installation	6																	
H	Internal access roads	1																	
I	Inverter installation	1																	
J	Commissioning	6																	
K	Commercial operations	-																	
L	Project completion	-																	

3.2.1.2 Early works

Early works will include the following:

- Preliminary civil works, including:
  - earthworks to level site to a stable foundation
  - backfilling as required.
- Removal of existing non-remnant vegetation and topsoil where applicable, and site preparation.
- Topsoil stockpiling.
- Construction of access road connection, internal site roads, site access gate, and carpark.
- Pre-drilling for pile installation.
- Management of water flow and flood prevention.
- Implementation of erosion and sediment control measures.
- Construction of perimeter fencing, and any other fencing where it applies.
- Establishment of the construction compound and laydown areas.

3.2.1.3 Construction and infrastructure installation

This stage will include:

- Installation of steel posts in the ground to form the foundation of the solar tracking system. Posts are normally driven directly into the ground (piled) without the use of concrete.
- Installation of electrical and communications cables in underground trenches that run from the combiner boxes to modular PCS units.
- Installation of the 11 kV transmission cable (methodology to be confirmed dependent on selection of an underground or overhead powerline).
- Tracker assembly which involves the installation of tracker 'torque tubes' on top of the vertical steel posts, along with tracking motors and gearing systems. Solar modules are then mounted on the torque tubes using brackets and wired to 'combiner boxes' located at the end of the tracker arrays.
- Installation of PCS units on piles or concrete pads.
- Installation of a 100 kL (estimated) water storage tank for maintenance activities.

3.2.1.4 Commissioning

Commissioning of the Project will involve testing of all equipment.

3.2.2 Construction hours

Construction will take place during standard construction hours Monday to Sunday 6.30 am to 6.30 pm.

3.2.3 Construction workforce

It is estimated that a construction workforce of approximately 50 full-time equivalent (FTE) personnel will be required. It is assumed that the Project's workforce will primarily be sourced from the local region, with workers accommodated locally in the townships of Wandoan, Miles, Condamine, or Chinchilla.

No Project-specific temporary workers accommodation is required to facilitate solar farm construction.

3.3 Project operations

3.3.1 Land use and management

Following completion of the construction phase, all areas within the Development footprint will be retained for infrastructure operations and maintenance as shown in **Figure 3.3**. Laydown areas will be retained as workspaces for future maintenance activities. The entire Development footprint will be managed by a third party under contract to Arrow Energy for the life of the Project (approximately 20 years) and returned to Arrow Energy management once all infrastructure has been removed (refer to **Section 3.4**).

3.3.2 Operational workforce

The Project is estimated to support up to eight (8) direct and indirect jobs throughout the operational life of the Project. The direct operational workforce is expected to consist of the following:

- Approximately four FTE positions (one on-site in Charge position and three operators), which will be the same operating team as the SGP North FCS hybrid power facility.
- Given the expertise required to operate the SGP North FCS hybrid power facility, the operational roles are expected to be fly-in-fly-out (FIFO). However, employment from the local area is preferred and it has been assumed that at least one FTE position would be able to be sourced from the local area upon commencement of operations. It is expected that the local employment rate could be higher over time and would have appropriate training.
- If the operational workforce cannot be sourced from the local area, a rostered FIFO rotational basis would occur (estimated two-weeks-on/two-weeks-off).
- The workforce will consist of two operators during normal operation, and a minimum of one operator during shift changes.
- An on-call procedure will be in place for periods outside of normal operating hours.
- It is expected that the Project will utilise local resources for site maintenance, including weed management, for approximately 72 hours per month. It is estimated that approximately 120 hours per year would be required from other local contractors (e.g. mechanical, electrical, refrigeration) for Project maintenance.

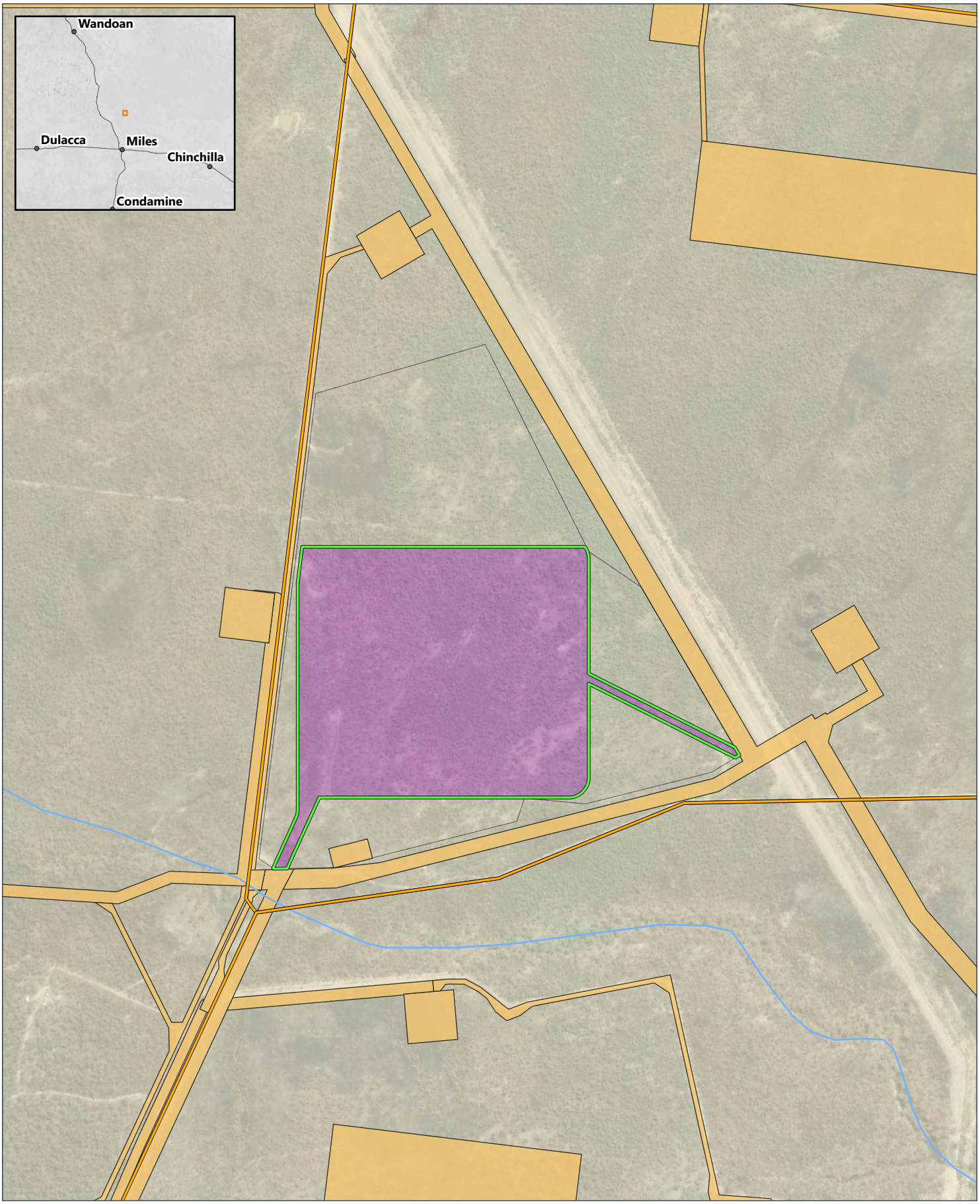
The operational team will be based at the SGP North HPF (i.e. their primary work location will not be within the Development footprint). These employees will visit the Project on a semi-regular basis but will utilise offsite amenities and offices. Periodic asset management staff and contractors visiting the solar farm will also utilise offsite amenities and offices. For longer-term maintenance campaigns, portable hire toilet services will be temporarily utilised within the Development footprint with all wastes disposed of off-site.

3.3.3 Hours of operation

Operations are anticipated to commence in Q2/Q3 2027. During operation, the Project will provide renewable energy directly to the FCS, reducing the facility's reliance on non-renewable energy sources and contributing to an overall emissions reduction (refer to **Section 1.1**)**.**

The Project will be in operation during daylight hours, every day of the year. Operation and maintenance activities may occasionally extend beyond daylight hours for corrective and preventative maintenance activities.

As the site will be remotely operated and monitored, employees will not be present at the site for day-to-day operations. However, employees will be required to attend the site for maintenance activities (refer **Section 3.3.4**).



Post-Construction Land Use

Figure 3.3

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GDA2020 MGA Zone 56

- Watercourse
- Project Site
- Project Area
- Cleared Area Retained For Infrastructure
- SGP North Authorised Disturbance
- Base Type Parcel

Land Use Mapping:

- Grazing native vegetation
- Utilities (Development Footprint)

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3.3.4 Maintenance tasks

Planned maintenance activities will include:

- Regular inspections (electrical, civil and environmental).
- Vegetation management (in line with various management plans, including grass cutting, APZ maintenance, and weed control).
- Cleaning activities (solar panel modules, meteorological station, etc.)
- Electrical maintenance.
- Other activities as defined in the operation and maintenance management plans.

Natural rainfall is typically adequate to keep the solar panels clean, however, washing down the solar panels may be required to maintain performance in times of low rainfall. Water will be trucked in and stored in a water tank provided specifically for this purpose.

Corrective maintenance activities will include:

- Testing and replacing of faulty plant components (modules, fuses, etc.)
- Any other corrective actions within the operations and maintenance scope.

3.3.5 Waste

Waste from operations will be limited and will be generated from the operations and maintenance activities listed in **Section 3.3.4**. Waste streams will primarily include general waste, including putrescible waste. Wastes which can be recycled, reused or recovered (including solar panels) will be placed into designated bins or areas and collected for disposal/recycling/reuse. Any regulated waste will be stored appropriately prior to being transported offsite by an authorised regulated waste contractor for disposal at a facility that is authorised to accept that type of waste.

3.4 Decommissioning

The anticipated Project life is up to 20 years (i.e. anticipated Project commencement in Q2/Q3 2027 and cessation in Q4 2047). Nearer to the end of the 20-year period, a decision will be taken whether to:

- extend the life of the existing infrastructure with increased maintenance, refurbishment and/or replacement of components;
- repower the Project with new infrastructure; or
- decommission the infrastructure and rehabilitate the area, where applicable.

Decommissioning will be carried out in stages with the removal of all above-ground infrastructure for recycling, disposal or reutilisation undertaken by the contractor. Once infrastructure has been removed, management responsibility will be returned to Arrow Energy who will rehabilitate cleared areas to their pre-existing condition, or an improved state, to allow for its continued agricultural use or another use as decided at the time.

4. Methodology

The ecological values within the Development footprint were initially identified through a combination of desktop and field-based assessments undertaken as part of the EIS and Supplementary EIS process for the broader SGP between 2009 and 2013, and extensive follow up surveys conducted by EcoSmart in 2016 and 2017 (EcoSmart, 2017). These studies have provided Arrow Energy with a comprehensive understanding of the ecological values and typical flora and fauna assemblages characteristic of vegetation communities and habitats in the broader SGP area, some of which are present within the SGP North Solar Farm Development footprint.

For the purposes of the PD, the presence of MNES in the Development footprint has been assessed using a combination of desktop assessment and recent (post-2020) field survey effort. The steps undertaken to assess the presence of MNES are summarised as follows:

- Review of methods and results from previous ecological assessments and habitat mapping for the Study area and the broader SGP.
- Desktop review of available literature and database searches for previously recorded, mapped or potentially occurring MNES.
- An initial (Pre-field work) Likelihood of Occurrence (LoO) assessment for the MNES identified within the Study area through desktop searches to inform preliminary field surveys.
- Preliminary ground-truthing surveys to document the condition and extent of vegetation communities, habitat types and other ecological values in the Development footprint.
- Analysis of field-based data in conjunction with aerial imagery to determine the extent of vegetation communities, habitat types, and associated MNES within and adjoining the Development footprint.
- Targeted ecological field surveys to identify:
  - threatened flora and threatened and migratory fauna species identified as potentially occurring within the Development footprint.
  - habitat resources for threatened flora and threatened and migratory fauna identified as potentially occurring within the Development footprint.
- Updating the LoO following the field surveys to re-assess the likelihood of MNES occurring within the Development footprint based on the results of the post-2020 field surveys (specifically the habitat assessments).
- Development of a suite of mitigation measures to minimise impacts to the identified likely and possible MNES (avoidance and mitigation measures are presented in **Section 8**).
- Undertaking significant impact assessments (SIA) in accordance with the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (DoE, 2013) and supplemented with species-specific referral guidelines (where relevant) to confirm the likelihood of significant impacts to relevant MNES (provided in **Section 9**).

4.1 Desktop review

Desktop assessments were undertaken to confirm the understanding of the environmental values, landscape features, vegetation communities and threatened and migratory species that are known or have the potential to occur within the Study area (as defined in **Section 1.2**). Database searches were performed using a 10 km search radius. All MNES predicted to have potential habitat were included in the list for further assessment and consideration. A 50 km search radius was also reviewed for any highly mobile fauna species.

The following data sources were reviewed for the desktop assessment:

- DCCEEW's Protected Matters Search Tool (PMST) to identify MNES with the potential to occur within the Study area. Search results were obtained on 26 May 2026 (provided in **Appendix E**).
- DCCEEW's Species Profiles and Threats Database (SPRAT).

- Department of the Environment, Tourism, Science and Innovation (DETSI) WildNet database to identify previously recorded flora and fauna species within the Study area, including non-native species. Search results were obtained on 26 May 2026 (provided in **Appendix E**.).
- DETSI's mapping to identify potential MSES within the Development footprint including state conservation areas, wetlands, waterways, threatened species and essential habitat.
- DETSI mapping to identify potential MSES within the Development footprint including regulated vegetation mapping (i.e. remnant, high-value regrowth and non-remnant vegetation), and protected plants' high-risk trigger areas.
- eBird records of threatened and/or migratory birds.
- Atlas of Living Australia (ALA) database and distribution mapping.
- High-resolution satellite imagery.
- Published ecological information on threatened flora and fauna species where available.

4.1.1 Likelihood of Occurrence

The likelihood of Threatened Ecological Communities (TECs) and threatened and migratory species initially identified in the desktop review occurring within the Study area was assessed to identify those values which may occur within the Development footprint. This LoO assessment considered the distribution of the species or community, the ecology of this species or community, the occurrence of nearby records, the availability of suitable habitat and relevant field data that had already been collected (pre-2020) across the area of the Development footprint as part of the broader SGP.

4.1.1.1 Pre-fieldwork LOO

The definitions that were adopted for the pre-fieldwork LoO assessment were:

- **Known to Occur** – the species or ecological community has been recorded within the Development footprint (either directly or indirectly).
- **Likely to Occur** – suitable habitat for the species is present within the Development footprint and records exist within a 10 km radius of the Development footprint (from the past 20 years). Regional ecosystems (REs) that meet diagnostic criteria and conditions thresholds for the ecological community are mapped within the Development footprint.
- **Possibly Occurring** – suitable habitat for the species is present within the Development footprint *but* the habitat is marginal/suboptimal *or* records have been identified within a 10 – 50 km radius of the Development footprint *or* the species is migratory and nomadic and may only occur in the Study area on a seasonal and/or infrequent basis.
- **Unlikely to Occur** – the Development footprint contains suitable habitat for the species, however, the nearest record is more than 50 km from the Development footprint. Alternatively, while nearby records occur within 50 km of the Development footprint, no suitable habitat for this species has been identified. REs that meet diagnostic criteria and condition thresholds for the ecological community are not present within or adjacent to the Development footprint.

4.1.1.2 Post-fieldwork LOO

These preliminary LoO determinations were updated to incorporate the revised understanding of habitat distribution for potentially occurring species following the (post-2020) targeted MNES surveys undertaken across the Study area.

The definitions adopted for the post-fieldwork LoO assessment were:

- **Known to occur** - the species or ecological community has been recorded within the Development footprint (either directly or indirectly).
- **Likely to occur** – the habitat assessments undertaken for the Project identified that suitable habitat for the species is present within the Development footprint and species records (Wildnet or ALA) within the 50 km search extent are from the year 2000 onwards.

- **Possibly occurring** – the habitat assessments undertaken for the Project identified that suitable habitat for the species is present within the Development footprint and species records (Wildnet or ALA) within the 50 km search extent are older than the year 2000.
- **Unlikely to occur** – suitable habitat for the species is either not present within the Development footprint and/or limited in quality and/or extent such that the habitat would not support the species and/or lacks the necessary habitat or microhabitat features.

The output from the final LoO assessment has been provided in **Appendix F**.

4.2 Field surveys

The vegetation communities, fauna assemblages and habitat types present within the Study area are widely distributed across the Brigalow Belt and have been extensively sampled as part of consolidated survey efforts across the broader SGP since 2009. As a result, flora and fauna assemblages and characteristic microhabitats associated with these broad vegetation communities and habitats within the Study area are well understood.

For the purposes of this PD only recent (post-2020) survey efforts undertaken within the Study area have been considered as ground-truthing field surveys (information from earlier surveys is considered as 'desktop' information only). A summary of the various survey programs that have been undertaken within the Study area post-2020 and used as ground-truthed evidence in this PD have been summarised in **Table 4.1**.

The following sections provide a more detailed overview of these recent flora and fauna survey efforts undertaken within the Study area.

Table 4.1: Summary of ecological survey programs undertaken within the Study area

Survey	Details	Timing	Assessment by/Experience
BioCondition / Modified Habitat Quality Assessment	Impact site BioCondition	July 2025	Darren Maxwell – 25+ years Caitlin Cope – 1.5 years
Targeted MNES Fauna Survey	Detailed fauna assessments	June 2025	George Madani – 20 years Sophia Harris – 1 year
Targeted MNES Flora Surveys	Walkover surveys to detect threatened MNES flora	October 2023	Richard Floyd – 30 years Kate Rigg – 2 years
Vegetation community survey	Ground-truthing of vegetation communities Habitat assessments	August 2023	Richard Floyd – 30 years Kate Rigg – 2 years
Supplementary EFS surveys	Vegetation survey and habitat assessments	2021-2024	Arrow Energy (various ecologists)

4.2.1 Flora survey effort

Project-specific RE mapping and an assessment of terrestrial flora values has been based on numerous field surveys undertaken across the broader SGP since the original EIS studies commenced in 2009. Since this time, the ground-truthed regional ecosystem (GTRE) mapping across the Project has been refined and updated numerous times, most recently by Attexo in 2023. Vegetation assessments undertaken across the Study area were conducted in accordance with the *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland V7.0* (Neldner et al, 2023) and the Guide to determining terrestrial habitat quality (DES 2020). Post 2020 flora survey efforts have included:

- **BioCondition Assessments**: Uses a condition assessment framework for Queensland that provides a measure of how well a terrestrial ecosystem is functioning for biodiversity values. It is a site-based, quantitative and therefore repeatable assessment procedure that can be used in any vegetative state and provides a numeric

score that can be summarised as a condition rating from functional through to dysfunctional condition for biodiversity. A total of eight BioCondition sites have been assessed within the Study area (refer to **Figure 4.1**). The raw datasheets for these BioCondition sites are included in **Appendix G**.

- **Quaternary Site Assessments**: Used as the main source of data collection whilst traversing through an area, these surveys were undertaken at regular intervals to confirm the presence of already identified vegetation communities and to refine the mapping boundaries of where these vegetation communities change. These assessments are rapid assessments when compared to the more comprehensive secondary, tertiary or BioCondition sites. A total of 35 Quaternary sites have been assessed within the Study area (refer to **Figure 4.1**). The Quaternary sites within the Study area were superseded by the more detailed BioCondition surveys provided in **Appendix G**.
- **Targeted MNES flora surveys**: Targeted surveys have been undertaken for several MNES flora species which were initially identified as possibly occurring within the Study area, including: Belson's panic (*Homopholis belsonii*), Curly-bark Wattle (*Acacia curranii*), *Calytrix gurulmundensis* and *Homoranthus decumbens*. Surveys for these species involved both systematic and random meanders through areas of suitable habitat. Approximately 2.2 km of systematic surveys and 67.5 km of random meander surveys have been undertaken within the Study area during the 2023-2025 surveys. The tracks showing the route of meander surveys are illustrated in **Figure 4.1**.
- **Opportunistic observations**: Whilst conducting survey efforts across the Study area, opportunistic observations of any threatened flora species were also recorded.

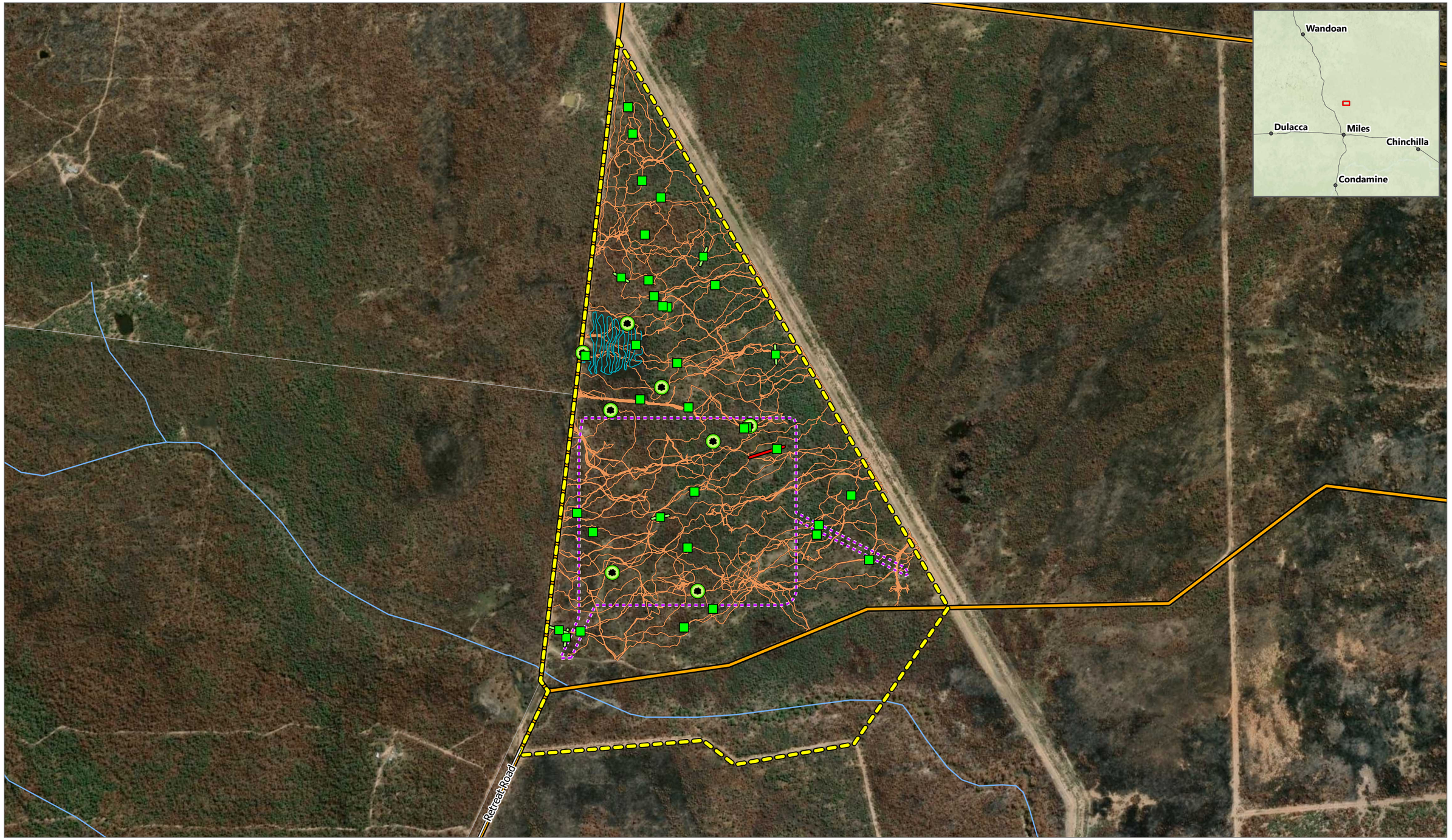
4.2.2 Fauna survey effort

The Project-specific fauna assemblage information was initially collected within the broader SGP and presented in the original SGP EIS in 2013. This information has been supplemented by several more recent fauna survey programs (both generic and targeted), most recently by Attexo in 2025. The survey methodologies adopted during these recent survey programs were primarily informed by the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre *et al*. 2022a) and species-specific survey guidelines available for targeted MNES fauna. Post 2020 fauna survey efforts are shown on **Figure 4.2** and include:

- **Diurnal Bird Surveys**: Either undertaken in the early morning (i.e. within 2-4 hours of sunrise) or late afternoon (within 2 hours of sunset) by 2 observers for 20 minutes. These bird surveys were undertaken in June 2025 within the various vegetation communities and habitat types identified in the Study area. A total of 23 diurnal bird surveys were undertaken within the Study area in June equating to approximately 14.5 person hours.
- **Active Diurnal Searches**: Typically undertaken across the Study area by two observers meandering through suitable fauna habitat for at least 30 minutes. During these surveys the observers would roll rocks and logs, search through woody and leafy debris, inspect trees for scratches, locating scats or feeding remains. These surveys were undertaken in June 2025. A total of approximately 41.5 person hours of active diurnal searches were undertaken within the Study area.
- **Spotlighting Surveys**: Typically conducted by two observes (on foot) who would walk through areas of suitable habitat and spotlight for nocturnal fauna species. Spotlighting surveys were conducted for around 30-60 minutes at different locations within the Study area. Sites were typically selected during the day and were situated within areas of representative fauna habitat. A total of approximately 31 person hours of spotlighting surveys were undertaken over 5 nights in June 2025. The tracks used during this spotlighting are illustrated in **Figure 4.2**.
- **Harp Trapping Surveys**: These were undertaken in June 2025 in areas of suitable habitat throughout the Study area in response to the detection of *Nyctophilus* sp. (a genus of microbat) calls using passive acoustic detection. Species within this genus (which includes the threatened Corben's long-eared bat (*Nyctophilus corbeni*)) cannot be identified to species level using the call alone, so harp trapping is recommended to determine if this species is present. Harp traps were deployed in areas with a higher likelihood of bat activity such as along flyways, where they were deployed after sunset and collected before sunrise. Harp traps were deployed at 5 sites for a total of 25 trap nights (over 5 nights) across the Study area.
- **Koala Spot Assessment Technique (SAT) Surveys**: The SAT methodology was adopted across a wider area prior to final site selection (i.e. including but extending beyond the Study area) as the most appropriate survey technique at the time of these surveys in accordance with *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus* (Phillips and Callaghan 2011). This survey technique

involved searching for Koala scats around the base of 30 suitable food trees at each survey site. Based on the density of other koala survey methods (i.e. active diurnal searches and spotlighting surveys) within the Study area, a single SAT survey located in vegetation along the tributary of Bottle Tree Creek to the south of the Development Footprint was considered adequate (**Figure 4.2**). Twelve additional SAT surveys were also undertaken in areas nearby but outside of the Study area.

- **Habitat Assessments**: These assessments were undertaken across the Study area in each vegetation community and areas representative of each available habitat type. The focus of these assessments is to collect sufficient microhabitat information to inform the development of habitat mapping rules that have subsequently been adopted across the Project. A total of 36 habitat assessments have been undertaken within the Study area. The raw datasheets for these habitat assessment sites are included in **Appendix G**.
- **Incidental Observations**: Whilst conducting survey efforts across the Study area, opportunistic observations of any threatened fauna species were also recorded.



- Quaternary Sites
- Systematic Survey Tracklog
- Random Meander Surveys Tracklog
- BioCondition Site
- Quanternary Transect
- Secondary Transect
- Watercourse
- Local Road
- Project Site
- Study Area
- Development Footprint
- Base Type Parcel

SGP NORTH SOLAR FARM
Flora Survey Effort

Figure 4.1

N

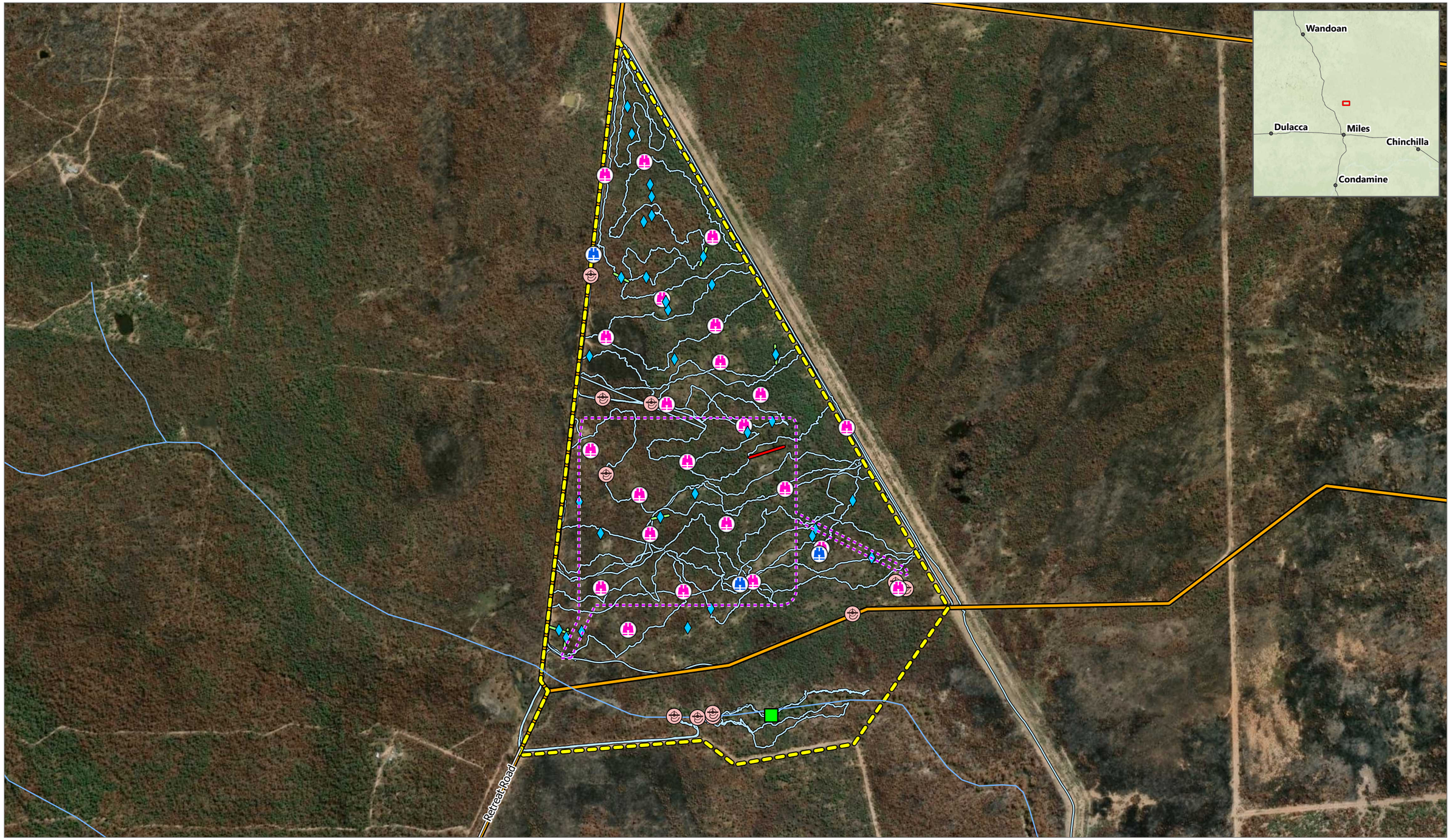
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Data Source:Created by Adam Tolo. Based off an existing Survey123 BioCondition form., © State of Queensland (Department of Resources), 2023, © State of Queensland (Department of Resources) 2022, Vantor, © State of Queensland (Department of Natural Resources and Mines) 2016, © State of Queensland (Department of Resources) 2023, © State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025

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- Koala Survey
- Active Site Search
- Bird Survey
- Harp Trap
- Habitat Assessment
- Diurnal Search
- Habitat Asessement
- Spotlighting Tracks
- Local Road
- Watercourse
- Project Site
- Study Area
- Development Footprint

SGP NORTH SOLAR FARM
Fauna Survey Effort

Figure 4.2

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4.2.3 Survey adequacy assessment

The various targeted survey programs undertaken across the Study area were designed to assess flora and fauna species identified in the desktop literature review, pre-field work LoO assessment and the results of historical surveys undertaken across the broader SGP. No MNES species are 'Known to Occur' in the Study area vicinity. MNES species initially identified through the desktop process as either 'Likely to Occur' or 'Possibly Occurring' within the Development footprint vicinity included:

- Corben's long-eared bat, *Nyctophilus corbeni*
- Greater glider (central and southern), *Petauroides volans*
- Koala, *Phascolarctos cinereus*
- South-eastern glossy black cockatoo, *Calyptorhynchus lathami lathami*
- Diamond firetail, *Stagonopleura guttata*
- Painted honeyeater, *Grantiella picta*
- Squatter pigeon (southern), *Geophaps scripta scripta*
- White-throated needletail, *Hirundapus caudacutus*
- Fork-tailed swift, *Apus pacificus*
- Dunmall's snake, *Furina dunmalli*
- Yakka skink, *Egernia rugosa*
- Curly-bark Wattle, *Acacia curranii*
- *Calytrix gurulmundensis* (a native shrub)
- Belson's panic, *Homopholis belsonii*
- *Homoranthus decumbens* (a native shrub).

A summary of the survey efforts undertaken for each of these species against the relevant State and Commonwealth survey guidelines is provided in **Table 4.2**.

Experienced botanist searches across the Study area have confirmed that the four threatened flora species are not present within the Development footprint and are unlikely to occur in the vicinity.

Detailed in-field habitat assessments of the site by experienced fauna ecologists (as detailed in **Table 4.2**) found that yakka skink is unlikely to occur on the site due to the absence of microhabitat features that are important to the species (these findings are presented in detail in **Section 6.1**).

In relation to fauna species, compliance with the guidelines is required if it is argued that a likely or possibly present species is absent or occurs at very low abundance within a study area (DSEWPaC, 2011). The LoO assessment (detailed in **Section 6.1**) has assumed that all of the potentially present threatened fauna species occur in the Development footprint.

Table 4.2: Targeted MNES – Survey Effort (post-2020) within the Study area

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
Mammals				
Corben's long-eared bat	Survey guidelines for Australia's threatened bats (DEWHA 2010).	Calls are not reliably distinguishable from other sympatric *Nyctophilus* species using Anabat detectors. Passive acoustic detection can be used to identify areas used by long-eared bats and followed up with an appropriate level of trapping to identify to species level. For a Project area <50 ha the following is recommended: • Harp traps – 20 trap nights over a minimum of 5 nights and/or • Mistnets – 20 net nights over a minimum of 5 nights Surveys best conducted on warmer nights from October through to April.	*2025 Survey efforts* • Harp trapping (25 trap nights over 5 nights) in June	The 2025 survey effort was outside the recommended survey window for this species however, habitat assessments confirmed the presence of abundant microhabitat features for this species. Therefore, the LoO assessment (**Section 6.1**) has assumed that Corben's long-eared bat is likely to occur within the Development footprint.
Greater glider (southern and central)	Queensland Terrestrial Vertebrate Fauna Survey Guidelines (Eyre *et. al.* 2022)	Stratification of Project area by habitat type with at least three 100 m x 100 m survey sites per type: • 2 x 30 person minute spotlight survey per 100 m x 100 m area • Incidental detection. This species is detectable all year if present.	*2025 Survey efforts* • Habitat assessments (12 sites) • Spotlighting (31 person hours over 5 nights) in June *2020-2024 Survey efforts* • Habitat assessments (95 sites)	The LoO assessment (**Section 6.1**) has assumed that greater glider is likely to occur within the Study area. The Development footprint consists entirely of regrowth woodland habitat or remnant shrubland habitat and has no large trees or suitable hollows for nesting or sheltering.
Koala	A review of koala habitat assessment criteria and methods	Multiple techniques should be used to confirm koala presence. To determine true absence, conduct surveys utilising multiple methods that	*2025 Survey efforts* • Habitat assessments (12 sites)	Although no direct or indirect evidence of koalas was detected during the surveys, the LoO assessment (**Section 6.1**) has

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
	(Youngentob et al, 2021) Queensland Terrestrial Vertebrate Fauna Survey Guidelines (Eyre *et. al.* 2022)	take temporal variation into account. Methods include: • Direct observation techniques including transect and point surveys, spotlighting and camera traps. • Indirect survey techniques including scat surveys (SAT and rapid-SAT), koala rapid assessment method, balanced koala scat survey (BKSS). Call playback and passive acoustic surveys during the koala mating season (late spring/early summer).	• Spotlighting (31 person hours over 5 nights) in June *2020-2024 Survey efforts* • SAT surveys (12 sites) • Habitat assessments (21 sites)	assumed that koala is likely to occur within the Development footprint.
Birds				
South-eastern glossy black cockatoo	Targeted species survey guidelines for Glossy black-cockatoo, *Calyptorhynchus lathami* (Queensland Herbarium 2025b).	Diurnal bird surveys conducted on foot by walking transects in: • areas with *Allocasuarina* trees • water bodies suitable for drinking sites and • areas containing large, hollow-bearing eucalypts. Active searches of walking transects through areas containing *Allocasuarina* trees to detect signs of feeding presence (chewed sheoak cones or 'orts'). Surveys can be carried out at any time of year however, seasonal movements may be more prevalent in areas where resources are more dispersed or in response to dry conditions. If large hollow bearing eucalypts are present, surveys may need to be repeated between March and August to determine whether birds are nesting in the Project area.	*2025 Survey efforts* • Habitat assessments (12 sites) • Diurnal bird surveys (14.5 person hours over 3 days) in June • Active searches (41.5 person hours over 3 days) in June *2020-2024 Survey efforts* • Habitat assessments (21 sites)	Although diurnal bird surveys and active searches for orts undertaken in June 2025 did not detect any evidence of south-eastern glossy black cockatoo, the LoO assessment (**Section 6.1**) has assumed that this species is likely to occur within the Development footprint. The habitat assessments confirmed the absence of any large, hollow-bearing trees from the Development footprint.

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
Diamond firetail	Queensland Terrestrial Vertebrate Fauna Survey Guidelines (Eyre *et. al.* 2022)	No species-specific survey guidelines are available for this species. Generic guideline methods recommend 6 x 5-10 min area searches within 100 m x 100 m survey area. Where practical, surveys should be done at different times (early morning, mid-morning and afternoon).	*2025 Survey efforts* • Habitat assessments (12 sites) • Diurnal bird surveys (14.5 person hours over 3 days) in June *2020-2024 Survey efforts* • Habitat assessments (21 sites) • Incidental bird observations	Although diamond firetail has never been detected during surveys for the broader SGP and was not detected during the June 2025 surveys, this species has very broad habitat preferences and is difficult to exclude. The LoO assessment (**Section 6.1**) has assumed that diamond firetail is likely to occur within the Development footprint.
Painted honeyeater	Targeted species survey guidelines for Painted honeyeater, *Grantiella picta* (Queensland Herbarium 2025a).	*During breeding season* - area searches conducted on foot and targeting foraging and breeding habitat which includes woodlands where mistletoes are abundant. Early spring to late summer (November to January on the Darling Downs) to coincide with periods of mistletoe fruit and flower abundance. • Minimum effort: 4 hours • Minimum number of days: 4 days Surveys should be undertaken during daylight hours, preferably in the early morning (<2 hours after sunrise) and late afternoon (<2 hours before sunset). *Outside breeding season*, birds show up in random areas outside their core habitat (usually in association with fruiting mistletoes) which should be accounted for by increasing survey effort.	*2025 Survey efforts* • Habitat assessments (12 sites) • Diurnal bird surveys (14.5 person hours over 3 days) in June *2020-2024 Survey efforts* • Habitat assessments (21 sites) • Incidental bird observations	Habitat assessments identified the sporadic presence of mistletoe in all vegetation communities. Mistletoe is not abundant within the Study area and as such, does not constitute 'core habitat'. Although the diurnal bird surveys undertaken in June 2025 (outside breeding season) did not detect any painted honeyeater, the LoO assessment (**Section 6.1**) has assumed that painted honeyeater possibly occurs within the Development footprint.

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
Squatter pigeon (southern)	Survey guidelines for Australia's threatened birds	Area searches or transect surveys in suitable habitat. Flushing surveys also likely to be useful. Areas searches or transect surveys (<50 ha) • Minimum effort: 15 hours • Minimum number of days: 3 days Flushing surveys (<50 ha) • Minimum effort: 10 hours • Minimum number of days: 3 days	*2025 Survey efforts:* • Habitat assessments (12 sites) • Diurnal bird surveys (14.5 person hours over 3 days) in June *2020-2024 Survey efforts* • Incidental bird observations	Although diurnal bird surveys did not detect this species, the LoO assessment (**Section 6.1**) has assumed that squatter pigeons could periodically occur in disturbed habitats within and adjoining the Development footprint.
White-throated needletail and Fork-tailed swift	Referral guideline for 14 birds listed as migratory species under the EPBC Act (DoE 2015a)	Both species are non-breeding migrants typically present in Australia between October and April. Swifts (including needletails) should be counted by an experienced person from elevated viewpoints during the summer. If white-throated needletails are known to occur, observations should be made as late as possible in the evening of birds coming into roost in tall trees along ridgetops.	*2025 Survey efforts* • Diurnal bird surveys (14.5 person hours over 3 days) in June *2020-2024 Survey efforts* • Incidental bird observations	As the 2025 surveys were completed outside times when both species are known to be present in Australia, the LoO assessment (**Section 6.1**) has assumed that white-throated needletail and fork-tailed swift periodically occur (as fly-over species above the Study area).
Reptiles				
Dunmall's snake	Survey guidelines for Australia's threatened reptiles (DSEWPAC 2011) Draft referral guidelines for the nationally listed Brigalow Belt	No survey methods are known to reliably detect the species. Likely to only be active between sheltering sites at night. Presumably active late spring through early summer to early autumn, with peak activity likely to be early summer through to the wet season. Recommend active searching of sheltering sites, pitfall trapping or road driving at night	*2025 Survey efforts* • Habitat assessments (12 sites) • Nocturnal active searches/ Spotlighting (31 person hours over 5 nights) in June *2020-2024 Survey efforts*	The 2025 survey effort was undertaken outside the recommended survey window for Dunmall's snake however, habitat assessments confirmed the presence of suitable microhabitat features that this species could utilise. An abundance of scattered small-medium sized coarse woody debris, soil cracks and

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
	reptiles (DCCEEW 2023b)	(particularly after wet weather). Other recommended methods include: • Active searches (1.5 hour person hours per hectare over a minimum of 3 days) • Spotlighting on warm, humid evenings targeting water-inundated gilgais, wetlands, riparian habitats and surrounding environment at night (1.5 person hours per hectare over a minimum of 3 nights) • Opportunistic surveys of roads following heavy rainfall events and during warm evenings • Pitfall and funnel trapping	• Habitat assessments (21 sites)	termite mounds were observed within the Study area, particularly within patches of regrowth RE 11.5.1. Therefore, the LoO (**Section 6.1**) has assumed that Dunmall's snake is likely to occur within the Development footprint. While the coarse woody debris observed provides suitable habitat for the Dunmall's snake, it was not large enough or consolidated enough to provide suitable habitat for the yakka skink (see below).
Yakka skink	Survey guidelines for Australia's threatened reptiles (DSEWPAC 2011). Targeted species survey guidelines for yakka skink, *Egernia rugosa* (Queensland Herbarium (Queensland Herbarium, 2025c) Draft referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW 2023b)	Queensland Museum specimen records suggest a peak in activity in late spring and summer like other large *Egernia* species. Most active during the early morning and late afternoon though there are reports of both diurnal and (on warm nights) nocturnal activity. Searching for burrow systems and communal defecation sites is the most reliable method of detection. Species can be confirmed by Elliot trapping around burrows, by distant observation with binoculars or by shining a torch down the burrows at night. Other recommended methods include: • Active searches (1.5 hour person hours per hectare over a minimum of 3 days)	*2025 Survey efforts* • Habitat assessments (12 sites) • Active searches (41.5 person hours over 3 days and 5 nights) in June • Opportunistic scanning of logs and burrows from ~30m distance in June *2020-2024 Survey efforts* • Habitat assessments (21 sites)	Comprehensive habitat assessments and active searches conducted throughout the Study area confirmed the lack of suitable microhabitat features to support this species. The site lacked all large log piles, large hollow logs, rock piles, excavated soil mounds, suitable burrow systems or latrine sites. Whilst scattered coarse woody debris was observed, these were not considered to be large enough or consolidated enough to act as suitable habitat for yakka skink. This coarse woody debris was however considered in the assessment of suitable habitat for the Dunmall's snake (see above).

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
		• Spotlighting targeting large logs on warm humid evenings (1.5 person hours per hectare over 3 nights) • Elliot and cage trapping once burrows have been identified over a period of 4 days.		The vegetation within the site is generally considered too young to provide suitable microhabitat features for the yakka skink. Whilst a single egernid scat was observed during these surveys, this was not found within the latrines characteristic of this species and was assessed as likely belonging to the more common *Ergernia striolata*. The LoO assessment (**Section 6.1**) has assessed yakka skink (which has never been recorded within the broader SGP area despite significant survey effort) as unlikely to occur.
Plants				
Curly-bark wattle	No species-specific survey guidelines available. Survey techniques adapted from the Flora Survey Guidelines – Protected Plants (DETSI 2025).	Walking meanders in areas of suitable habitat. Readily identified by its distinctive bark at all times of the year.	*2025 Survey efforts* • Systematic meander surveys through remnant vegetation (2.2 km of tracks) in June • Random meander surveys through regrowth and predominantly cleared vegetation (67.5 km of tracks) in June	Surveys were adequate to detect Curly-bark wattle, a perennial species which is readily identified by its distinctive bark at all times of the year. The field survey botanists confirmed this species does not occur in the Study area vicinity.

Species	Relevant survey guidelines	Recommended methods	Project survey effort	Justification
Belson's panic	No species-specific survey guidelines available. Survey techniques adapted from the Flora Survey Guidelines – Protected Plants (DES, 2020).	Walking meanders in areas of suitable habitat.	*2025 Survey efforts* • Systematic meander surveys through remnant vegetation (2.2 km of tracks) in June • Random meander surveys through regrowth and predominantly cleared vegetation (67.5 km of tracks) in June *2023 Survey efforts* • Random meander surveys through regrowth and predominantly cleared vegetation in July and August	Surveys were adequate to detect Belson's panic. Species not present in surveyed areas and considered unlikely to occur.
Calytrix gurulmundensis and *Homoranthus decumbens*	No species-specific survey guidelines available. Survey techniques adapted from the Flora Survey Guidelines – Protected Plants (DES, 2020).	Walking meanders in areas of suitable habitat.	*2020-2024 Survey efforts* • Systematic meander surveys through areas of suitable habitat (2.2 km of tracks) in June	Surveys were adequate to detect both of these distinctive perennial species. The field survey botanists confirmed neither of these species occur in the Study area vicinity.

4.2.4 Habitat Mapping

The quantification of potential habitat values for each of the species considered in this PD is discussed further in **Section 6**. This habitat mapping was informed by field-based information collected across the Study area, including but not limited to:

- A review of the GTRE mapping across the Study area.
- The presence of the following microhabitat features throughout the Study area:
  - The composition of understory vegetation and the abundance of native grasses;
  - The occurrence and distribution *Allocasuarina*, *Angophora*, *Casuarina*, *Corymbia* and *Eucalypt* species;
  - The occurrence of tree hollows or bark fissures; and
  - The presence/absence of mistletoe.

4.2.5 Modified Habitat Quality Assessment Surveys

To assess the Project's impacts under the EPBC Environmental Offset Policy framework, the Modified Habitat Quality Assessments (MHQA) is currently the best practice approach to derive Habitat Quality Scores (HQS) for input into the EPBC Offset Calculator. To help determine the Project's EPBC Offset obligations, MHQA surveys were undertaken across the Study area in accordance with the following guidelines:

- *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 7.0* (Neldner et al. 2023).
- *BioCondition Assessment Manual* (Eyre et al. 2015).
- *Guide to determining terrestrial habitat quality Version 1.2* (DES 2020).
- *Guidance on the use of the Modified Habitat Quality Assessment Method* (DCCEEW 2025).

GTRE surveys undertaken across the Project described three distinct Assessment Units (AUs) which were assessed using a total of eight MHQA sites. These sites were established in representative patches of the identified AUs to allow for variation in the condition of each unit. In accordance with the MHQA methodology, the following attributes were measured at each of these sites:

- Site Condition
  - Recruitment of woody perennial species in EDL
  - Native plant species richness
  - Native shrub species richness
  - Native grass species richness
  - Native forb species richness
  - Tree canopy height (average of E, T1 and T2)
  - Tree canopy cover (average of E, T1 and T2)
  - Shrub cover
  - Native grass cover
  - Organic litter
  - Large Trees (eucalypt and non-eucalypt)
  - Coarse woody debris
  - Non-native plant cover
  - Quality and availability of food and foraging habitat
  - Quality and availability of shelter
- Site Context
  - Size of patch
  - Connectedness

  - Context
  - Ecological Corridors
  - Role of site location to species overall population in the state
  - Threats to the species
  - Species mobility capacity
- Species Stocking Rate
  - Presence detected on or adjacent to site
  - Species usage of the site
  - Approximate density (per ha)
  - Role/importance of species population on site

A detailed MHQA methodology document outlining how these attributes have been calculated for each MNES is included with the Offset Proposal at **Appendix C**.

5. Description of the environment

The Project site is one of four land parcels that make up Girrahween Station which was purchased by Arrow Energy in 2012 for the purpose of developing its SGP North gasfields.

The Development footprint (located in the far west of the Project site) contains predominantly non-remnant native vegetation which has been subject to a history of clearing and disturbance. A review of historical aerial photography in QImagery confirmed that:

- The Development footprint was cleared by 1972 and maintained as cleared land until the 1980s; and
- Vegetation has been encroaching on cleared areas in the north of the Development footprint since the 1980s, though cleared areas have been maintained in the southern part (refer to **Plate 5.1**and **Plate 5.2**).

Vegetation within the Development footprint is still grazed, with patches of cleared land interspersed with mixed eucalypt regrowth, buloke and *Callitris* stands (RE 11.5.1). Parts of the Development footprint were significantly fire-damaged as a result of the wildfires affecting the area in December 2022 with vegetations still affected at the time of the most recent surveys in June 2025.

The Development footprint currently supports a grazing land use under native vegetation and subject to an existing agistment agreement. Surrounding land uses are predominantly rural, rural residential and industrial. Two petroleum pipelines (PPL153 and PPL163) with a combined easement width of approximately 100 m run along the eastern boundary of the Development footprint, separating it from adjoining remnant vegetation to the east (refer to **Figure 5.1**)

Plate 5.1: Historical imagery of the Project site -1972 (left) and 1984 (right)

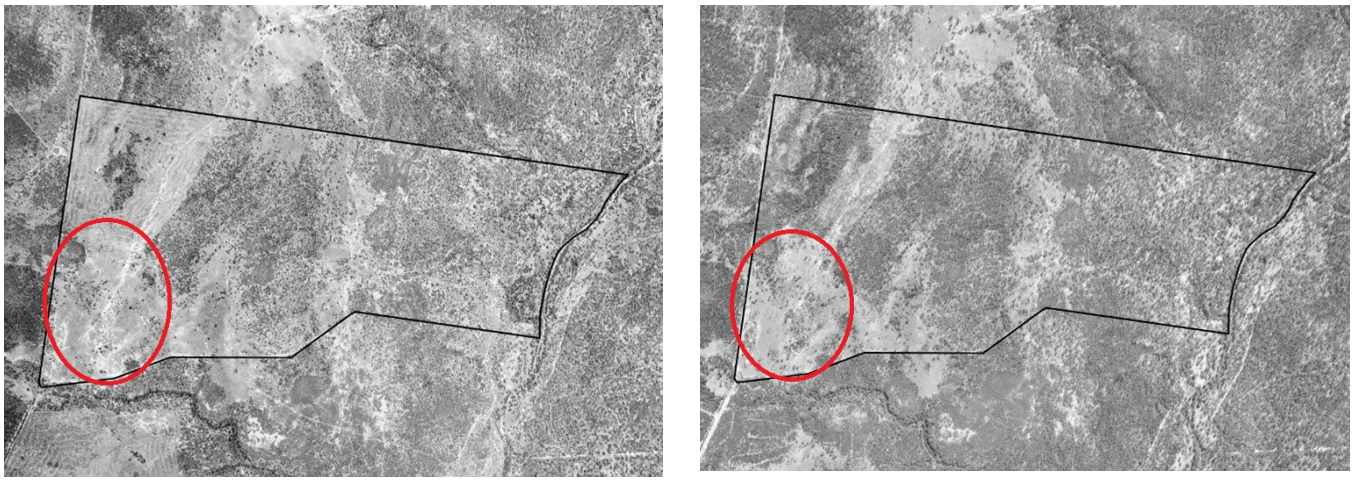
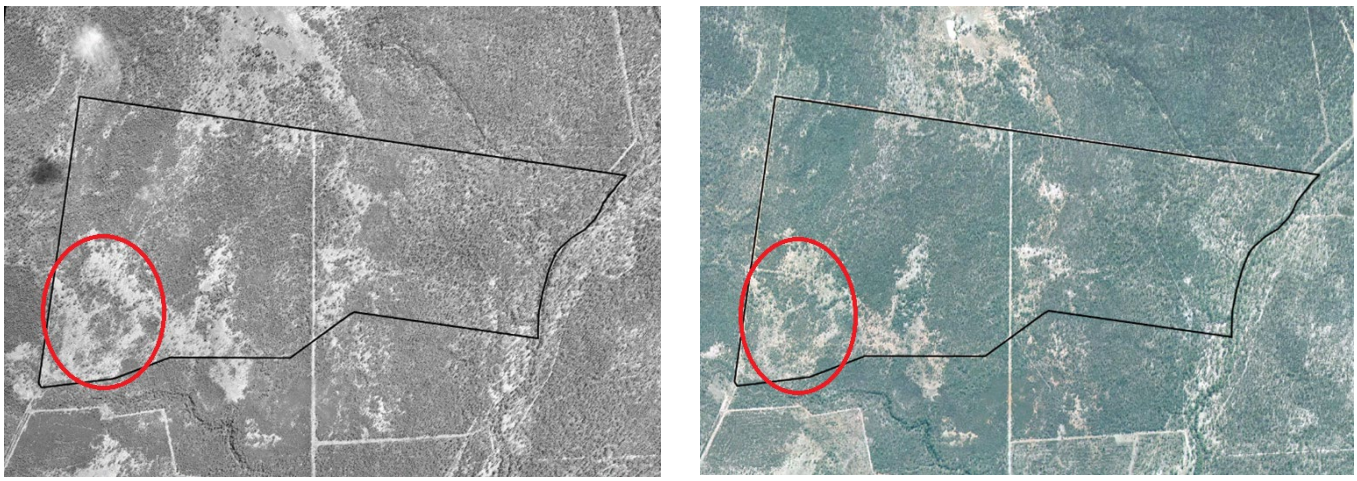
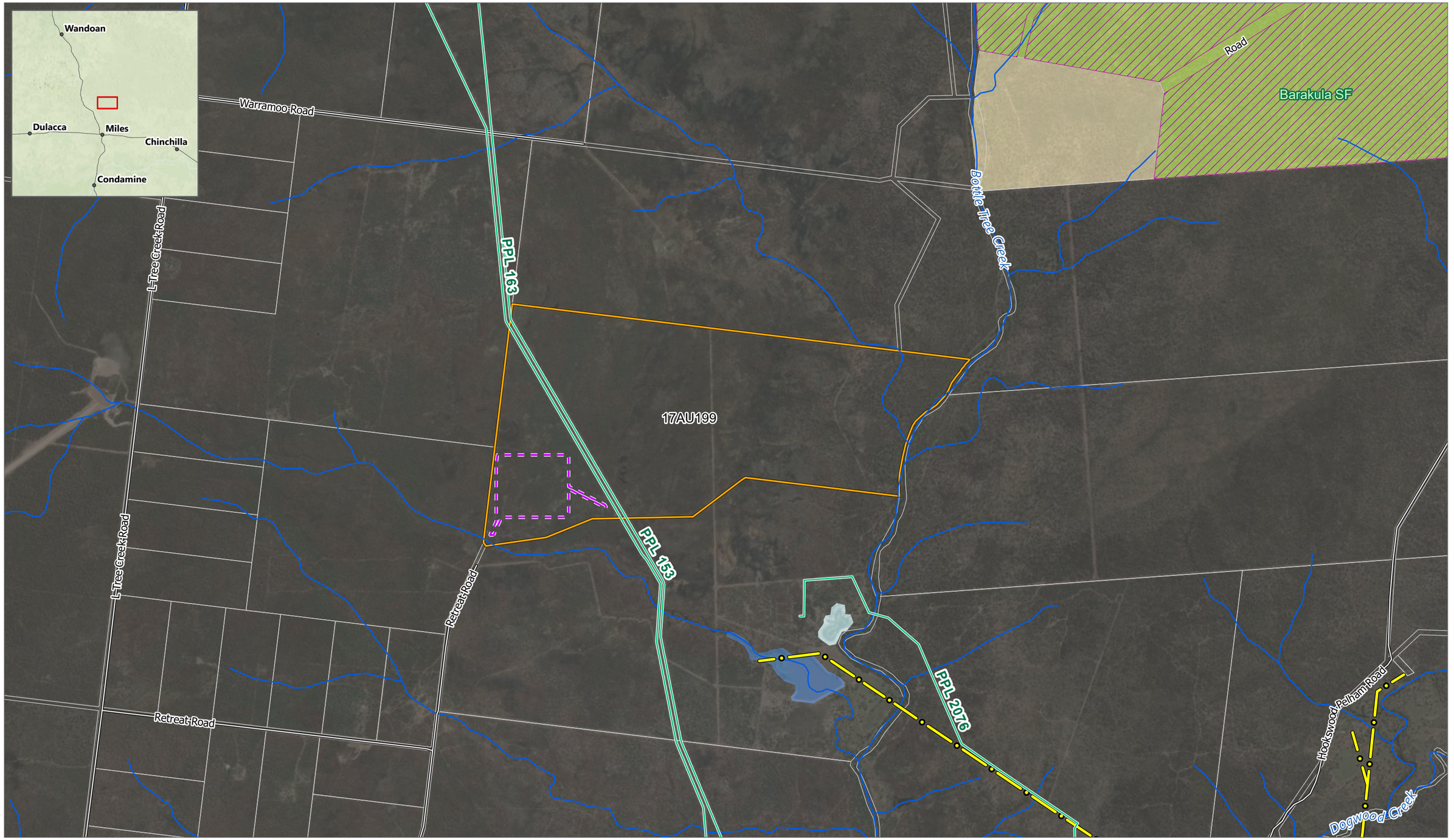


Plate 5.2: Historical imagery of the Project site – 1992 (left) and 2002 (right)





Local Road

Watercourse

Granted Petroleum Pipeline Licences Centreline

Network SWER (Single Wire Earth Return)

Project Site

Development Footprint

State Forest

Base Type Parcel

Queensland Land Use Mapping:

- Nature conservation
- Grazing native vegetation
- Production forestry
- Lake
- Reservoir/dam

SGP NORTH SOLAR FARM
Land Use and Infrastructure

Figure 5.1

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Data Source:© State of Queensland (Department of Resources) 2022. Not to be used as a definitive absolute location of reserve boundaries. This dataset is derived from the Digital Cadastre Database (DCDB). The accuracy of the spatial representation is determined by the accuracy of records in the version of the DCDB from which this dataset was derived., © State of Queensland (Department of Resources), 2023, State of Queensland (Department of Environment and Science), March 2019. The Land use of Queensland is a product of the Australian Collaborative Land Use and Management Program (ACLUMP). ACLUMP, of which QLUMP is a partner, promotes the development of consistent information on land use and land management practices. This consortium of Australian, state and territory government partners is critical to providing nationally consistent land use mapping at both catchment and national scale, underpinned by common technical standards including an agreed national land use classification. ACLUMP provides a national land use data directory and the maintenance of land use datasets on Australian and state government data repositories. More information on ACLUMP available at www.abares.gov.au/landuse., Vantor, ©

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5.1 Topography

The Development footprint ranges in elevation from approximately 331 m in the north to approximately 326 m in the south, sloping very gently towards the tributary of Bottle Tree Creek to the south of the Development footprint. The slope across the Development footprint is <1% from north to south (refer to **Figure 5.2**).

5.2 Geology and soils

The Development footprint surface geology is mapped as predominantly QS (miscellaneous unconsolidated sediments), with Springbok Sandstone in the west (DoR 2025) as shown in **Figure 5.3**.

Table 5.1: Surface geology units

Map unit	Rock unit name	Lithology	Dominant rock	Age
Qs	Qs-Sq	Sand, red sandy soil, silt and some gravel; floodout and sheet sand with some alluvium	Miscellaneous unconsolidated sediments	Quaternary
Jis	Springbok Sandstone	Labile sandstone, siltstone, mudstone, some coal	Arenite-mudrock	Late Jurassic

The soils within the Development footprint have been mapped in "Murilla, Tara and Chinchilla Shires Land Management Manual, Southern Queensland" – MWD (Maher, 1996) as shown in **Table 5.2**.

This land resource assessment mapped land resource areas (LRAs) at a mapping scale of 1:250,000, based on combinations of geology, landscape features (such as slope and relief), vegetation and soil groups. These LRA map units are not designed to strictly identify the soils in a particular map unit, but to predict their probable occurrence, and will contain a number of common and associated soils (described as soil profile classes (SPCs)) which cannot be mapped separately at the 1:250,000 scale.

The Development footprint is wholly mapped as MWD_9A – Light Forests, as summarised in **Table 5.2**. This LRA unit is commonly associated with the Minnabilla, Braemar and Flinton soils[7] as described in the MWD land management manual. A brief description of these soil types is included below:

- Finton - Shallow to deep soils, sandy to loamy surface, with acid, red, massive subsoil overlying lateritised sandstone (Kandosols);
- Braemar - Moderately thick (20 to 40 cm), bleached sandy surface, over mottled, yellowish brown to greyish brown clay subsoil derived from sandstone (Sodosols);
- Minnabilla - Very shallow (<45 cm), gravelly, red (may occasionally be black) soils; rock outcrop (Tenosols / Rudosols).

The dominant soil (Flinton) is a deep red Kandosol that consists of a sandy loam to clay loam surface over clay loam to light clay subsoils that are medium acid to very strongly acid throughout. These soils are well drained and non-sodic with ironstone gravels a common feature of these soils.

[7] Local soil type name - In soil surveys, the map units are often actual soils, generally defined as soil profile classes (SPCs). SPCs are groups of similar soil profiles based on a defined central concept with a range of values.

Table 5.2: Land Resource Areas

Map Code	Dominant entity	Landform	Soils	Vegetation	Common Soils
9a	Light Forests	Undulating plains and rises, often lateritised;	Red, yellow or grey loam or earth soils.	Shrubby woodland and layered open forest of ironbarks, bull oak, wattles, cypress pine and Queensland peppermint with poplar box occurring on the deeper soils	Minnabilla (10%), Braemar (30%) and Flinton (60%)

5.3 Surface and Groundwater

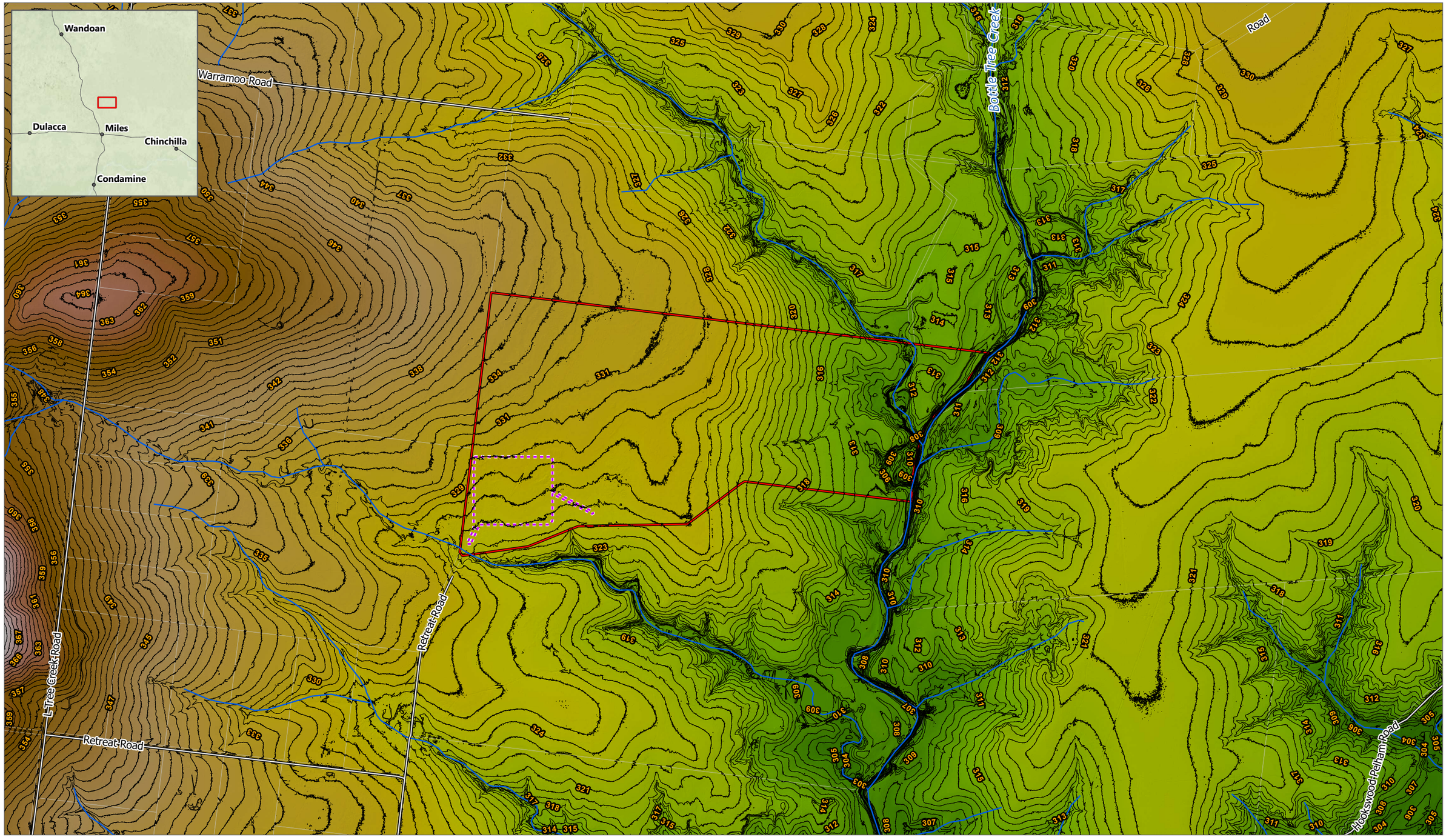
The Project site falls within the Condamine-Balonne River catchment area, which is one of the largest catchments in the Murray-Darling Basin. The lower Balonne River is a complex floodplain channel system which supports several wetlands of national importance, the nearest of which is the Ramsar-listed Narran Lake Nature Reserve approximately 400 km downstream of the Project site.

There are no watercourses within the Development footprint itself, with surface runoff conveyed via a tributary of Bottle Tree Creek which runs into Dogwood Creek and discharges into the Balonne River at its junction with the Condamine approximately 120 km downstream. All nearby waterways are ephemeral, typically carrying water only after rain. Specific hydrological characteristics that apply to the Project site/area include:

- The unnamed creek to the south of the Development footprint is mapped as a stream order 2; this drains east into Bottle Tree Creek which is mapped as a stream order 4;
- There are no mapped wetlands within the Development footprint. The only permanent water in the surrounding area is in the form of farm dams.

The major rivers in the Condamine-Balonne system typically support alluvial aquifers, with Bottle Tree Creek and tributaries mapped by the State as potentially supporting unconsolidated sedimentary aquifers. There are no identified groundwater dependent ecosystems (GDEs) within the Development footprint. The tributary to the south of the Development footprint has been mapped as having a low confidence of terrestrial GDE areas.

Surface and groundwater hydrology features relevant to the Development footprint are shown in **Figure 5.4**.



1m Contour
Local Road
Watercourse
Development Footprint
Project Site
Base Type Parcel

Elevation (m):
371
300

SGP NORTH SOLAR FARM
Topography

Figure 5.2

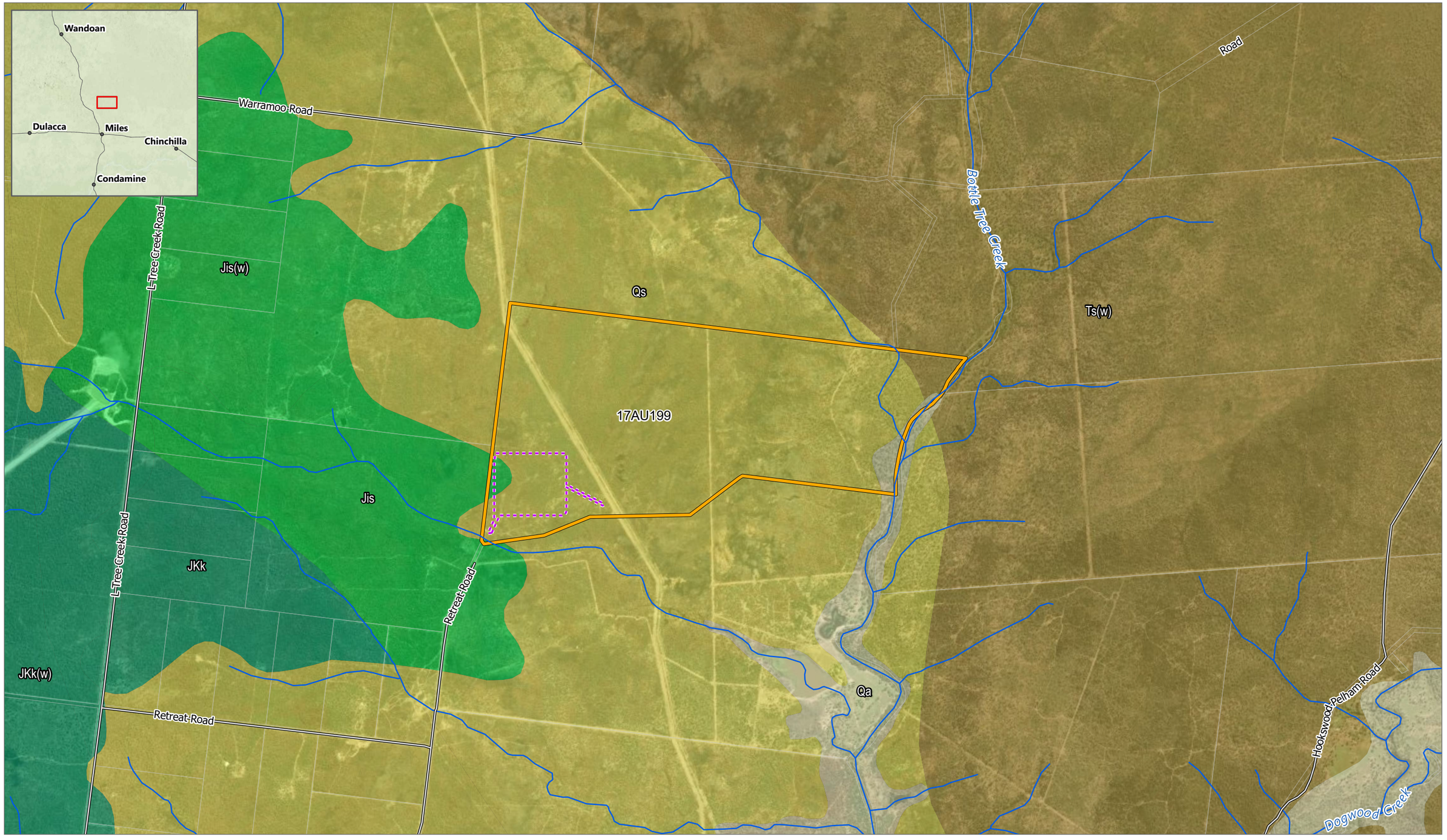
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Highway
Main Road
Local Road
Watercourse

Project Site
Development Footprint
Base Type Parcel

Detailed Surface Geology:

- Kumbarilla beds (JKk)
- Kumbarilla beds(w) (JKk(w))
- Qa-QLD (Qa)
- Qs-SQ (Qs)
- Springbok Sandstone (Jis)
- Springbok Sandstone (w) (Jis(w))
- Ts(w)-QLD (Ts(w))

SGP NORTH SOLAR FARM
Detailed Surface Geology

Figure 5.3

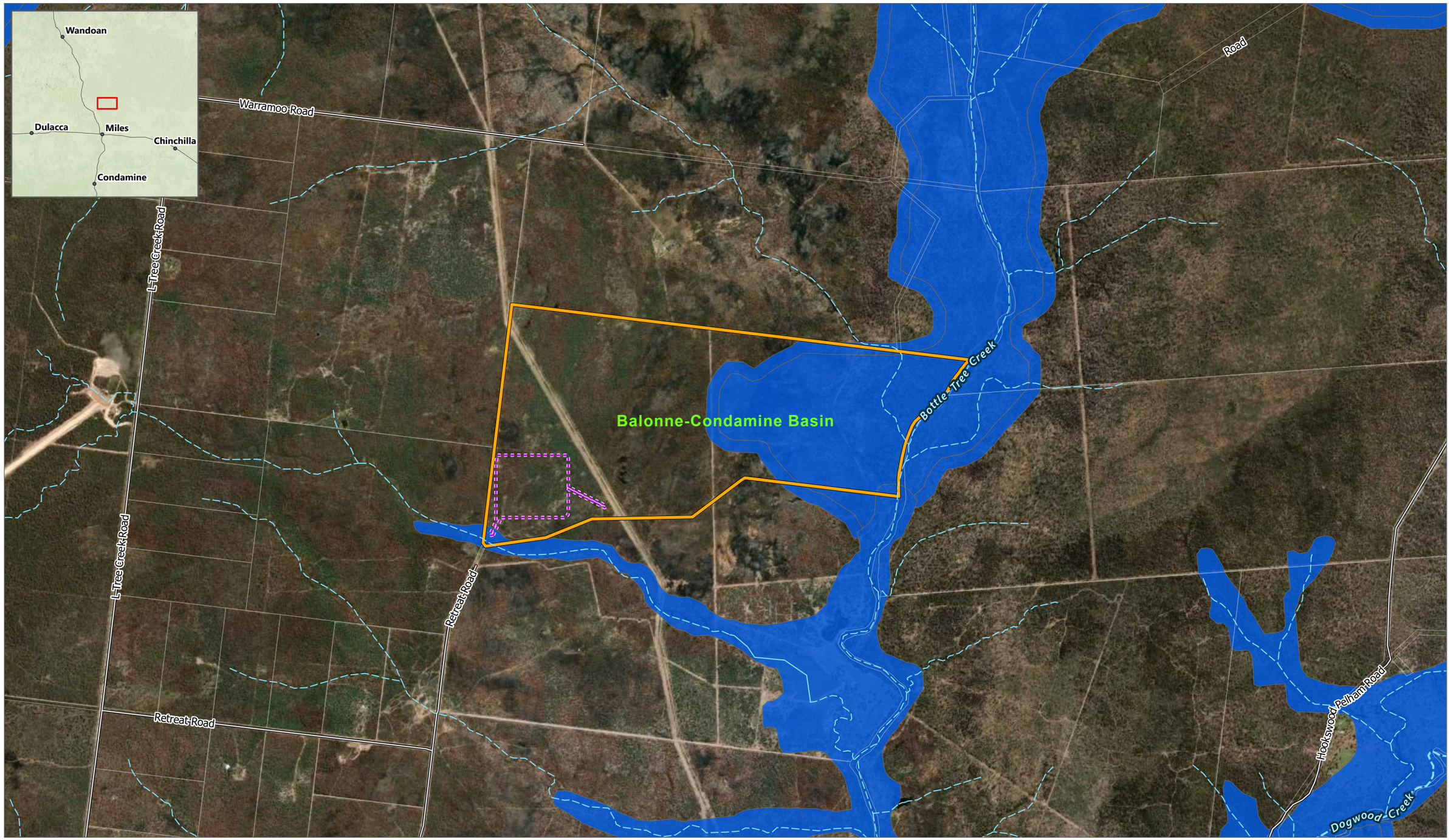
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Major - non perennial
Minor - perennial
Minor - non perennial
Local Road

Project Site
Development Footprint
Drainage Basins
Base Type Parcel

Potential Groundwater Dependent Ecosystem Aquifers:

Unconsolidated sedimentary aquifers

SGP NORTH SOLAR FARM
Hydrology

Figure 5.4

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0 Km 1

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5.4 Terrestrial flora

5.4.1 Vegetation communities

The Development footprint has been subject to historical clearing as described in **Section 5** and is shown as 'Category X' (non-remnant) on the Queensland Department of Resources' Regulated Vegetation Management Map (RVMM) (refer to **Figure 5.5**). This mapping was verified in the field to confirm the type, extent and boundaries of remnant and regrowth vegetation in the Development footprint. The Development footprint was found to be contain either cleared (non-remnant) areas or regrowth eucalypt woodland on Cainozoic sand plains, which corresponds to RE 11.5.1.

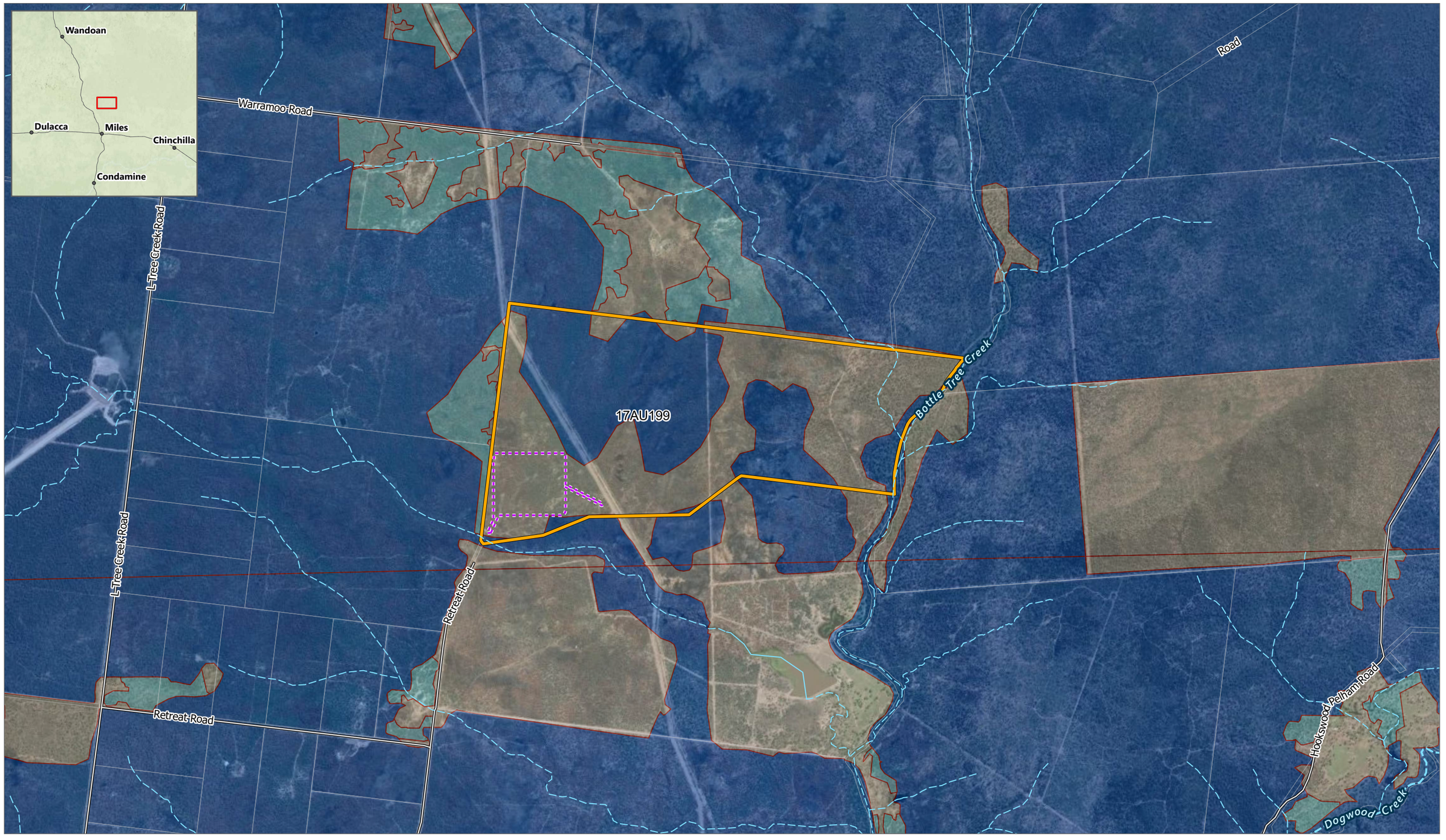
The areas mapped as regrowth (refer to **Figure 5.6**) correspond with previously cleared areas, with the following departure from certified RE mapping identified:

- The area immediately to the north of the Development footprint was assessed as part of ground-truthing surveys in August 2023 and subsequently excluded from the Development footprint. It contains eucalypt woodland of poor quality but is considered to meet thresholds to be considered remnant in accordance with the Queensland Herbarium's Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities Version 6.0 (Neldner, 2022) when compared with BioCondition Benchmarks for RE 11.5.1 (20 m height and 25% canopy cover).

Ground-truthed RE descriptions for vegetation communities within the Development footprint are set out in **Table 5.3**. Representative photos of vegetation communities on the Project site are shown in **Plate 5.3** to **Plate 5.6**.

Table 5.3: Ground-truthed Regional Ecosystems within the Development footprint

RE	Description	VMA Status	Area (ha)
Regrowth			
Regrowth 11.5.1	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	Least concern	19.8
Non-remnant			
	Non-remnant	-	10.3
		Total	**30.1 ha**



Major - non perennial
Minor - perennial
Minor - non perennial
Highway
Main Road
Local Road
Project Site
Development Footprint
Base Type Parcel

Regulated Vegetation Mapping:

Category B
Category C
Category X

SGP NORTH SOLAR FARM
Regulated Vegetation Mapping

Figure 5.5

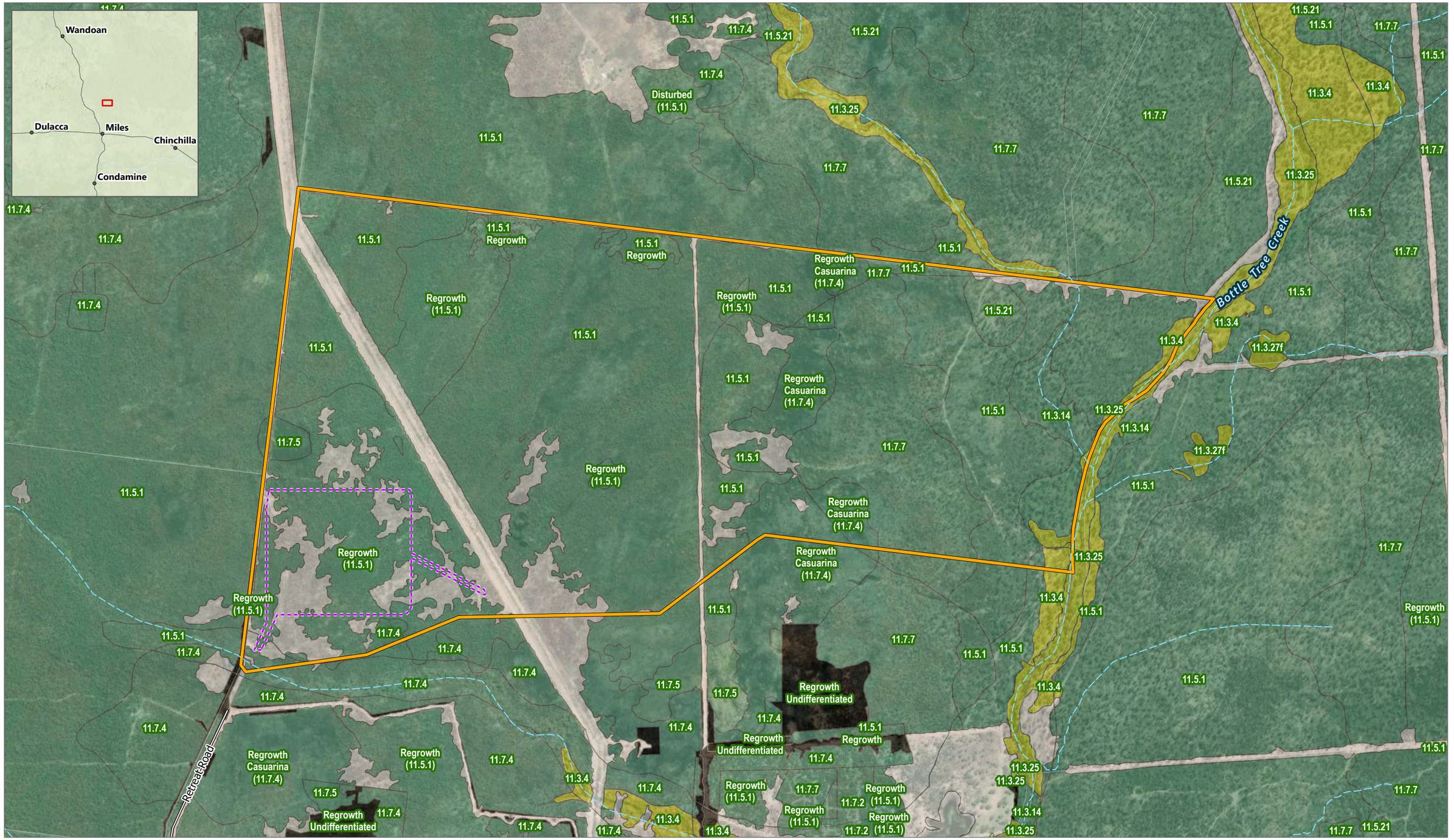
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Minor - non perennial

Local Road

Project Site

Development Footprint

Base Type Parcel

Ground-Truthed Regional Ecosystem Biodiversity Status:

- Of Concern
- No Concern at Present
- Non-Remnant
- N/A

SGP NORTH SOLAR FARM
Ground-Truthed Regional Ecosystem Mapping
Figure 5.6

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0 m 500

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Plate 5.3: Regrowth *Callitris glaucophylla* (RE 11.5.1) with fire damage in August 2023



Plate 5.4: Regrowth *Callitris galucophylla* (RE 11.5.1) post-fire in July 2025.



Plate 5.5: Remnant RE 11.5.1 with fire damage (immediately north of the Study area)



Plate 5.6: Cleared areas with *Callitris glaucophylla* (not impacted by fire) in August 2023



5.4.2 Flora species

A total of 86 flora species were identified within the Study area, comprising 84 native species and 2 exotic species. No threatened flora species protected under the EPBC Act were identified within the Study area. A list of all observed flora species within the Study area is provided within **Appendix H**.

5.4.3 Weed species

Weed species, particularly those listed as WoNS, restricted invasive plants under the Queensland Biosecurity Act and restricted pest weeds listed by the Western Downs Regional Council, were opportunistically recorded throughout the Study area.

Only two species of weeds were observed in two singular observations within the Study area, *Melinis repens* and an *Opuntia* sp. These species were within the ground cover within the regrowth and non-remnant RE 11.5.1. The weed species identified within the Study area and their relevant status within WoNS, under the Biosecurity Act and LGA listed weeds are provided in **Table 5.4**.

Table 5.4: Weed species observed within the Study area.

Scientific name	Common name	WoNS	Qld Biosecurity Act Status	LGA Listed Weed
Melinis repens	Red natal grass	No	No	No
Opuntia sp.	a tree pear	Yes	Restricted Invasive Plant – Cat 3	No

5.5 Terrestrial fauna

5.5.1 Habitat type and quality

Habitat within the Development footprint is predominantly regrowth eucalypt woodlands to open woodlands dominated by narrow-leaved ironbark (*Eucalyptus crebra*) with stands of buloke (*Allocasuarina luehmannii*) and white cypress pine (*Callitris glaucophylla*). Habitat types within the Development footprint based on ground-truthed REs (GTREs) include:

- Regrowth open eucalypt woodlands with grassy understorey and mixed stands of *Allocasuarina leuhmanii* and *Callitris glaucophylla* (corresponding to regrowth RE 11.5.1). Large parts of this habitat type have been affected to varying degrees by wildfire in December 2022 resulting in a simplified habitat structure at the time of the field assessments in August 2023 and July 2025 (refer to **Plate 5.7** and **Plate 5.9**).

There is a small creek immediately to the south of the Development footprint with burnt out canopy in the west (RE 11.5.1) but supporting large trees including *Corymbia citriodora*, *Angophora leiocarpa* and *Eucalyptus exserta* in a rocky gorge further downstream (RE 11.7.4) (refer to **Plate 5.8** and **Plate 5.10**). This area is approximately 100 m south of the Development footprint but is not impacted by the Project.

5.5.1.1 Microhabitat features

Most vegetation communities within the Development footprint were relatively young and have been subjected to historical disturbances in the form of cattle grazing, selective logging and recent bushfires in December 2022. As such, certain key microhabitat features that are typically present within highly vegetated areas were either absent or not present in sufficient quantities to provide suitable refugia for some of the MNES assessed in this report. For instance, no large trees (i.e. trees with a diameter at breast height of >30 cm) capable of supporting notable tree hollows were observed within the Development footprint. This indicated a lack of suitable breeding/nesting habitat for hollow dependent species such as the south-eastern glossy black-cockatoo.

The lack of large trees also translated into a lack of substantial coarse woody debris (CWD) within the Development footprint. Whilst CWD, typically characterized as ground debris with a diameter >10 cm, was observed across the Development footprint, none of this debris was very large. This distinction is particularly important when considering the microhabitat requirements of ground dwelling species such as the yakka skink and Dunmall's snake. Dunmall's snakes prefer small-medium sized scattered and semi-embedded CWD, earth cracks and other cavities and termite mounds to provide necessary breeding and foraging habitat (DoE 2025c). In comparison, yakka skinks require larger logs, ideally in log piles, to provide suitable habitat for the construction of burrow networks (DoE 2014b). The absence large CWD from the Project suggests that this area is unlikely to support yakka skink populations, but likely to support Dunmall's snake populations (as detailed in **Section 6.1**).

Plate 5.7: Regrowth woodland habitat characteristic of the Development footprint



Plate 5.8: Rocky gorge with large trees ~100 m south of the Development footprint



Plate 5.9: Fire-damaged vegetation adjoining creek line south of the Development footprint



Plate 5.10: Pooled water in creek line to the south of Development footprint



5.5.2 Connectivity

While the Development footprint adjoins the 'Barakula to St George State biodiversity corridor' to the north (refer to **Figure 5.7**), regrowth vegetation within the Development footprint is fragmented at the local scale due to:

- its separation from remnant vegetation to the east by the existing gas pipeline easement which has an approximate cleared width of 70 m. This corridor may be traversed by mobile species (e.g. koala, most bird species) but would generally be avoided by canopy-dependent species such as the greater glider that are not known to glide over this distance; and
- the existing boundary access track on the west side of the Development footprint which has an approximate cleared width of 15 m and converges with the pipeline easement immediately north of the Development footprint.

At the patch scale, historical clearing activities have resulted in areas of regrowth interspersed with cleared areas and limited tree cover. While these areas would be navigable by most fauna species, historical clearing and local fragmentation would be expected to result in loss of forest interior species which depend on large, interconnected stands of habitat and show aversion to forest edges and reduced diversity and abundance of small mammal species.

5.5.3 Fauna assemblages

A total of 50 fauna species were recorded within the Study area, comprised of the following:

- 34 bird species;
- 10 mammal species; and
- 1 reptile species.

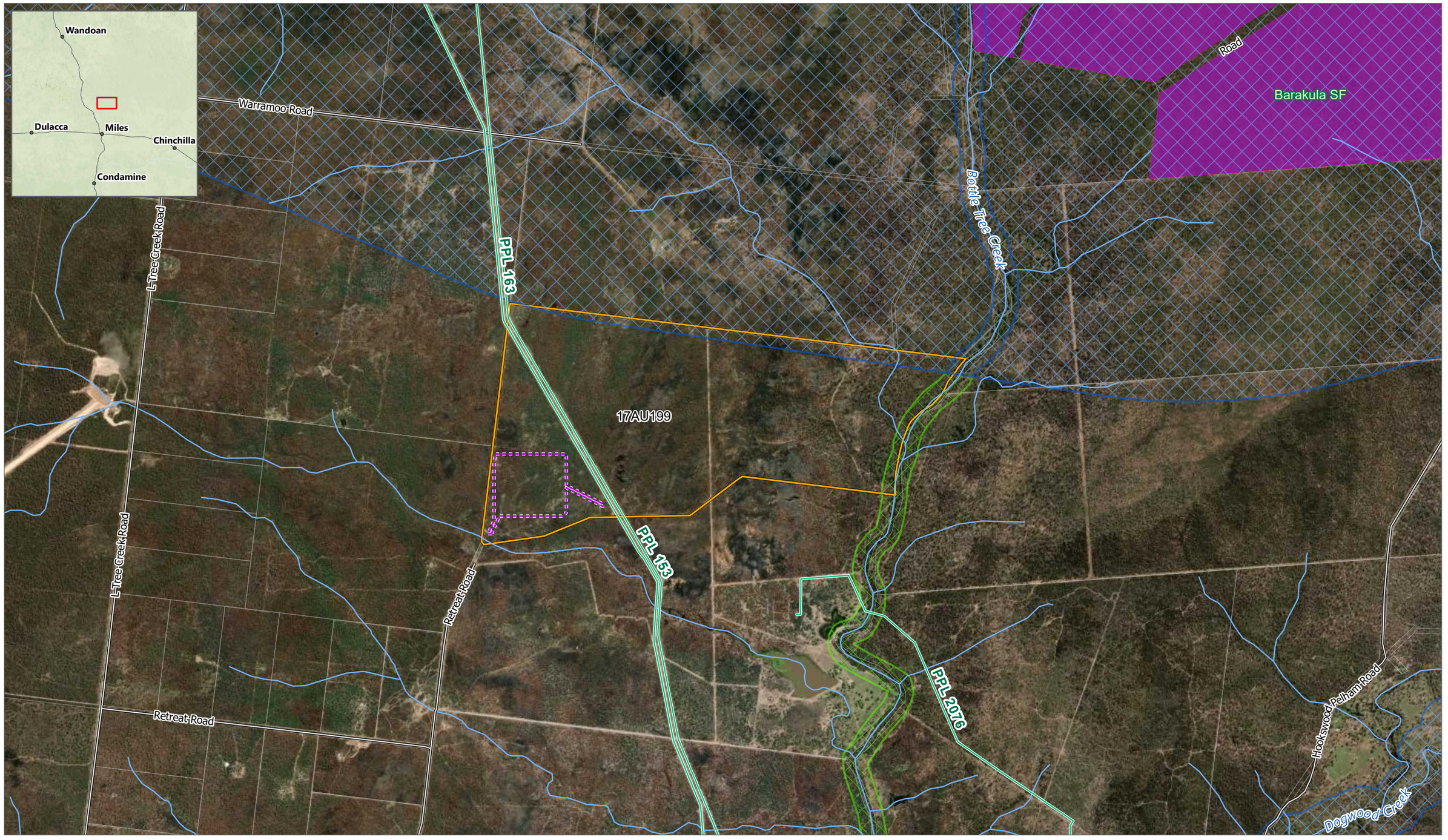
A list of all recorded fauna observations in the Study area is provided within **Appendix H**.

5.5.3.1 Pest fauna species

Database (PMST and Wildlife Online) searches of the Study area and surrounds (50 km) encountered records of approximately 17 introduced terrestrial fauna species. Four (4) of these species are also listed as Restricted Matters under the Biosecurity Act. In addition, while two introduced species were observed during field surveys, neither are listed as a Restricted Matter (refer to **Table 5.5**).

Under the Act, a person who has control over a Restricted Matter must not do the following:

- Category 3 – a person who has, or has a thing infested with the 'Restricted Matter' in the person's possession or under the person's control must not distribute or dispose of the Restricted Matter, unless the distribution or disposal is carried out via methods defined in the Biosecurity Act;
- Category 4 – move the 'Restricted Matter', or cause or allow it to be moved;
- Category 5 – keep the 'Restricted Matter' in the person's possession or under the person's control; and
- Category 6 – Provide food to the 'Restricted Matter'.



Local Road
Watercourse
Granted Petroleum Pipeline Licences Centreline
Project Site
Development Footprint
State Forest
State Biodiversity Corridor
Regional Biodiversity Corridor
Base Type Parcel

SGP NORTH SOLAR FARM
Biodiversity Corridors

Figure 5.7

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Table 5.5: Introduced fauna species known from the Study area and surrounds

Species name	Common name	Biosecurity Act Category	Observed within the Study area
Acridotheres tristis	Common myna	-	-
Bos taurus	European cattle	-	-
Canis familiaris	Dog	3, 4, 6	-
Carassius auratus	Goldfish	-	-
Columba livia	Rock dove	-	-
Cyprinus carpio	European carp	-	-
Equus caballus	Horse	-	-
Felis catus	Feral cat	-	X
Gambusia holbrooki	Mosquitofish	-	
Lepus europaeus	European brown hare	-	X
Mus musculus	House mouse	-	-
Oryctolagus cuniculus	Rabbit	3, 4, 5, 6	-
Passer domesticus	House sparrow	-	-
Rhinella marina	Cane toad	-	-
Spilopelia chinensis	Spotted dove	-	-
Sus scrofa	Feral pig	3, 4, 6	-
Vulpes vulpes	Red fox	3, 4, 5, 6	-

6. Matters of National Environmental Significance

Desktop searches of the PMST and Wildlife online databases completed on 23 February 2026 identified the following MNES as having the potential to be present within 10 km of the Study area:

- No World Heritage Properties;
- No National Heritage Places;
- Catchments relating to 4 Wetlands of International Importance;
- No Great Barrier Reef Marine Park;
- No Commonwealth Marine Areas;
- 4 Threatened Ecological Communities (TECs);
- 10 threatened flora species;
- 31 threatened fauna species; and
- 9 migratory species.

The nearest of the four Wetlands of International Importance is Narran Lake Nature Reserve which is over 300 km downstream of the Study area. The other three Wetlands of International Importance are all over 1,100 km downstream of the Study area. Given the limited size and nature of the Development footprint relative to the distance to these wetlands, there is no potential for the Project to impact any Wetland of International Importance.

The TECs identified as potentially present in the PMST search were:

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;
- Poplar Box Grassy Woodland on Alluvial Plains; and
- Weeping Myall Woodlands TEC.

A full list of these TECs and their corresponding RE descriptions as per conservation advice is provided in the Likelihood of Occurrence tables (**Appendix F**).

6.1 Likelihood of Occurrence Assessment

A LoO assessment has been completed for all threatened ecological communities and threatened and migratory species which these database searches suggested there was a potential to be present. The full likelihood of occurrence assessment is available as **Appendix H**.

No threatened ecological communities or MNES flora or fauna species have been recorded (are known to occur) in the Study area vicinity.

The field surveys for threatened flora species that the initial desktop LoO identified as potentially present confirmed that none of these species are present in the Development footprint, nor likely to occur in the vicinity.

The LoO assessment found that eight threatened fauna species are *likely to occur* in the Development footprint, namely:

- Corben's long-eared bat (listed as vulnerable)
- Greater glider (listed as endangered)
- Koala (listed as endangered)
- South-eastern glossy black-cockatoo (listed as vulnerable)
- Squatter pigeon (listed as vulnerable)
- Diamond firetail (listed as vulnerable)
- White-throated needletail (threatened and migratory)

- Dunmall's snake (listed as vulnerable).

One further threatened fauna species and one migratory species *possibly occur*, namely:

- Painted honeyeater (listed as vulnerable)
- Fork-tailed swift (listed as migratory only).

Likelihood of occurrence assessments for these species are addressed in detail in **Table 6.1**. This table includes assessment for three species that have been assessed as unlikely to occur. The following unlikely to occur species are included here as they were specifically raised in the RFI provided by DCCEEW:

- Yakka skink (listed as vulnerable)
- Belson's panic (listed as vulnerable)
- Curly-bark wattle (listed as vulnerable).

Table 6.1: Likelihood of Occurrence Summary

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
Mammal Species		
Corben's long-eared bat	Corben's long-eared bat has a patchy distribution across south-central Queensland, central-western New South Wales, north-western Victoria, and eastern South Australia. Most of its range lies within the Murray–Darling Basin, with most records occurring inland of the Great Dividing Range (TSSC 2015a). The species inhabits a range of inland woodland vegetation types, typically such as Eucalyptus and Callitris woodland, *Allocasuarina* woodland, *Acacia harpophylla* (brigalow) woodland, *Casuarina* woodland, and *Angophora* woodlands. The species is also known to inhabit *Eucalyptus camaldulensis*, Coolibah and various types of mallee vegetation. Within Queensland, the species can inhabit these diverse vegetation communities, however it is more frequently observed within vegetation communities comprising of box/ironbark *Eucalyptus* and *Callitris* species within a north-south belt along the western slopes and plains of New South Wales and southern Queensland (TSSC 2015a). The species tends to be more abundant within large and continuous tracts of woodland than in smaller, fragmented patches; suggesting that the species requires a large home range. It is also significantly more abundant in habitats that feature a well-developed tree canopy with a dense, cluttered understorey.	**Likely to occur** Habitat assessments and vegetation mapping undertaken across the Development footprint have confirmed the presence of suitable habitat for the Corben's long-eared bat. Whilst no records of this species have been recorded within the Project, several nearby records have been identified, the nearest of which being approximately 2 km to the south-east (Arrow, 2013). Local records of this species in Binkey State Forest, Condamine Starte Forest and Barakula State Forest (which is located within the same large patch of contiguous vegetation) indicate that local populations do occur in this region, and suitable habitat values identified within the Development footprint could be utilised.
Greater glider (southern and central)	The greater glider (southern and central) is found only in eastern Australia, where its area of occupancy has declined significantly since European settlement, primarily due to land clearing and subsequent loss of habitat. Its contemporary range extends from around Proserpine in north Queensland, through New South Wales and the Australian Capital Territory, to the Wombat State Forest in central Victoria. The species is also limited by elevation, occurring at altitudes up to 1,200 m above sea level (DCCEEW 2022b).	**Likely to occur** Habitat assessments and vegetation mapping undertaken across the Development footprint have confirmed the presence of suitable foraging habitat for the greater glider, however due to the lack of mature vegetation and sufficiently sized tree hollows, the Development footprint is unlikely to support any breeding habitat for this species.

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
	The greater glider (southern and central) is a nocturnal, arboreal marsupial that inhabits *Eucalypt* forests and woodlands within eastern Australia. It is most abundant within tall, montane, moist eucalypt forests with relatively old trees and an abundance of tree hollows (DCCEEW 2022b). This species has a preference for large hollows with a diameter greater than 10 cm. While suitable hollows can occur in both live trees and stags, this species demonstrates a preference for hollows within live trees, when there is adequate availability. Individual gliders may have multiple denning trees within their home range. Even in seemingly continuous areas of potentially suitable habitat, only a proportion of forest in potential habitat may meet the species' specific habitat requirements. These habitat types vary in relation to their structural attributes of the forest overstorey and the variability of food resources.	Whilst this species has not been recorded within the Development footprint, several nearby records have been identified, the nearest of which being approximately 8 km to the south-east (Arrow 2017). These records are associated with Dogwood Creek (of which Bottle Tree Creek is a tributary). Observations made along tributaries of Bottle Tree Creek (located to the south of the Project), indicate that mature riparian vegetation in these areas may provide suitable breeding habitat for locally occurring populations. Greater gliders are known to occupy home ranges that may be up to approximately 3 ha in size (DCCEEW 2022b) which would mean that locally occurring populations may forage within the Development footprint and den in adjacent mature vegetation. Local records of this species in Gurulmundi State Forest and Barakula State Forest (which is located within the same large patch of contiguous vegetation) indicate that local populations do occur in this region, and suitable habitat values identified within the Development footprint could be utilised.
Koala	Koalas are widespread across Queensland, occurring in patchy and often low-density populations across the different bioregions. They occur as far north as the Einasleigh Uplands and Wet Tropics bioregions with records to the south and west in the Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North, Brigalow Belt South and South-Eastern Queensland where they are most frequently sighted (DAWE 2022a). Koalas are tree-dwelling, obligate folivores which a highly specialised diet. Their diet is defined by the availability and palatability of a limited variety of *Eucalyptus*, *Corymbia* and *Angophora* species (DAWE 2022a). Local factors such as population density, food quality and availability, soil type and climate all influence the timing of breeding.	**Likely to occur** Habitat assessments and vegetation mapping undertaken across the Development footprint have confirmed the presence of suitable breeding and foraging habitat for the koala. While a nearby record of this species was identified approximately 9 km to the south-east. This record was from 1987, which doesn't necessarily reflect the contemporary distribution of locally occurring populations. The nearest recent record of this species is from Barakula State Forest approximately 26 km to the north-east (ALA 2017). There are scattered observations of this species in the region surrounding the Development footprint, with records occurring in

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
	Several studies have broadly recognised the koala's dispersal capabilities across cleared land (Melzer 1995; White 1999; Dique et al. 2003; Matthews et al. 2016). In addition to regular movements across the ground between trees within their own home ranges, koalas, particularly subadult males but also females, are known to disperse across distances of 1 to 3 km but sometimes over 10 km.	Barakula State Forest, Condamine State Forest and in various locations around Wandoan, Miles and Chinchilla. Whilst historical populations once occurred in the surrounding landscape, it is unclear whether local populations are currently utilising suitable habitats in the vicinity of the Development footprint. If present, this species is likely to occur in relatively low densities as is characteristic of koala populations in semi-arid areas (Davies *et. al.*, 2013).
Bird Species		
South-eastern glossy black-cockatoo	The south-eastern glossy black-cockatoo is uncommon but widespread and can be found from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria (DCCEEW 2022a). Their distribution is continuous through the forested parts of the Great Dividing Range but becomes more scattered inland, to as far west as the Riverina in New South Wales. South-eastern glossy black-cockatoos feed almost exclusively on the seeds of sheoaks (*Allocasuarina* and *Casuarina* spp.), usually relying on one or two species within a region (DCCEEW 2022a). This preference may explain the patchy distribution of the subspecies in parts of its range. Alongside the already narrow dietary requirement, the birds also show strong preference to individual feed trees and will not feed on many other proximate trees of the same species. In south-east Queensland, this species shows a preference for *Allocasuarina littoralis* (black sheoak) and *A. torulosa* (forest sheoak). There are also records of them feeding on *A. inophloia* (stringybark sheoak), *C. equisetifolia* (coastal sheoak) and, to a lesser extent, from *C. cunninghamiana* (river sheoak) and *C. glauca* (swamp sheaok) during limited times of the year (Chapman, 2007). They are hollow nesters, utilising large hollows in both living and dead eucalypt trees (DCCEEW 2022a).	**Likely to occur** No active or recent signs of glossy black-cockatoo feeding were observed and habitat assessments confirmed that no suitable nesting habitat (i.e. large hollows) occurs for this species within the Development footprint. Glossy black-cockatoos were observed feeding in riparian vegetation to the south of the Development footprint during supplementary EIS surveys in 2013 (approximately 1.5 km away). This observation is from RE 11.7.4 which may contain some *A. littoralis*. The dominant sheoak in the Development footprint (*A. luehmannii*) is not listed as a preferred feed tree species however, it is thought to be an occasional food source in inland NSW and may be used in some years (DCCEEW, 2022a). As this species is known to be abundant throughout Barakula State Forest, the area around Chinchilla and within Condamine State Forest and has previously been recorded within RE 11.5.1, it is considered likely that it would occasionally forage in and around the Development footprint.

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
Squatter pigeon (southern)	The known distribution of the Squatter Pigeon extends south from the Burdekin-Lynd divide in the southern region of Cape York Peninsula to the border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville. Their habitat is generally defined as open-forests to sparse, open woodlands and scrub that are mostly dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species. Like other granivorous birds inhabiting arid to semi-arid environments, squatter pigeons must drink regularly, possibly daily, and are described as being found nearly always near permanent water (Lloyd *et al* 2025). Foraging habitat is typically characterised as suitable habitat within 1.5 km of permanent water, whereas breeding habitat is typically characterised as suitable habitat within 500 m of permanent water. Foraging occurs on well-drained, gravelly or loamy soils which support open forest to woodland communities with patchy, tussock-grassy understories (DoE, 2025). Squatter pigeons construct their nests, which are usually shallow depressions scraped into the ground and sparsely lined with grass, underneath grass, shrubs or other microhabitat features.	**Likely to occur** Suitable foraging habitat for this species (open eucalypt woodlands and non-remnant areas typically with <30% cover) is present in the Development footprint. The nearest record for this species is approximately 12 km to the south-east (Arrow, 2012). Squatter pigeon is highly mobile and known to frequent cleared tracks and roadsides where they are easily visible. Compared with other parts of the species' range where there is often a concentration of records around a particular location, there is a low number of records within 50 km despite a significant increase in survey effort as a result of gas development in the region. This indicates that whilst the species is known to occur in the region surrounding the Project, they may only be locally abundant in certain areas, possibly in response to seasonal resource availability.
Diamond firetail	Diamond firetails occur on the southeast mainland of Australia from southeast QLD to Eyre Peninsula, South Australia, and about 300 km inland from the sea (DCCEEW, 2023a). Their range once extended to north Queensland inland from Cardwell, but they now occur only in the very south of the state. This species occurs in eucalypt, *Acacia* or *Casuarina* woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (DCCEEW 2023a). They tend to prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover where they flock in groups up to 40 individuals or more.	**Likely to occur** This species appears to be sedentary (though some populations move locally) and has never been detected during surveys for the broader SGP. The distribution of species records in the region surrounding the Project is difficult to interpret as there are few spatially accurate records in publicly available databases – there are no Wildnet records and most ALA records have been rounded to a 10 km grid. The nearest reliable record for this species is approximately 23 km to the north-west near Binkey State Forest (ALA, 2019). The only other spatially accurate records within 50 km of the Development footprint are associated with Gurulmundi State Forest

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
	They are known to roost in dense shrubs or in small nests built especially for roosting.	(approximately 13 km to the west) and Barakula State Forest (approximately 5 km to the north-east). Despite the scattered nature and spatial uncertainty of local records, this species has very broad habitat preferences and is often associated with woodland habitats similar to those in the Development footprint. However, given the lack of detection, this species would be expected to occur in low densities if present.
Painted honeyeater	The painted honeyeater is sparsely distributed from south-eastern Australia to north-western Queensland and the eastern Northern Territory (DoE 2015b). It is nomadic and occurs at low densities throughout its range (DAWE, 2021). The greatest concentrations and almost all records of breeding come from south of 26°S, on the inland slopes of the Great Dividing Range between the Grampians, Victoria and Roma, Queensland. The painted honeyeater is the most specialised of Australia's honeyeaters. This species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia dominated woodlands, paperbarks, casuarinas, *Callitris* and trees on farmland or gardens (DoE 2015b). They prefer woodlands that contain a higher number of mature trees, as these host more mistletoes, and are more common in larger patches of remnant vegetation than in strips of vegetation.	**Possibly occurring** Habitat assessments have confirmed the sparse presence of mistletoe species across the Development footprint (including regrowth 11.5.1 and non-remnant vegetation communities). Eucalypt dominated woodland communities may also provide limited seasonal foraging resources for this species when flowering. Whilst no records of this species have been recorded within the Development footprint, several nearby records have been identified in the region, the nearest of which is approximately 10 km to the south (ALA 1997). Local records from Barakula State Forest, Chinchilla, Condamine and Wandoan indicate that migrating populations are occasionally observed in the region surrounding the Project. It is likely, however, that these records are sporadic and linked closely to the availability of seasonal foraging resources. Painted honeyeaters will not occur in this region all year, and those that occur are likely to be ephemeral nomadic visitors, and not residential dependant populations.
White-throated needletail	The white-throated needletail is widespread in its Australian distribution, occurring in eastern and south-eastern Australia (TSSC 2019). Within eastern Australia, the species has been observed within all coastal regions along Queensland and New South Wales, extending	**Likely to occur** Considering the highly mobile and aerial nature of this species, it is likely that this species will utilise the airspace above the entire Development footprint as foraging habitat. The limited

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
	inland towards the western slopes of the Great Dividing Range, and on occasion into the adjacent inland plains. Further south on the mainland, the species is also widespread throughout Victoria and in adjacent areas of south-eastern South Australia through to the west of the Yorke Peninsula and the Mount Lofty Ranges. The species is widespread throughout Tasmania and occasionally recorded as a vagrant within the Northern Territory. When in Australia, the white-throated needletail is primarily aerial, flying from heights under 1 m to greater than 1000 m (TSSC 2019). Although the species is present throughout most habitat types, they are frequently observed above wooded areas such as open forests and rainforests, where they may fly below the canopy in between trees and in clearings. When above modified environments (such as in agricultural lands) the species has been observed above cleared pastures, plantations or remnant vegetation bordering paddocks. This species is thought to primarily roost on the wing, however there is some evidence suggesting that individuals may also use dense canopy foliage and hollows for roosting (TSSC 2019). Early literature suggested that they may roost on cliffs (Tarburton 2021) however more contemporary literature indicates that they almost exclusively roost in tree cavities (including nests), tree crevices, or on tree trunks (Yamaguchi et al. 2021).	abundance of mature remnant vegetation within the Development footprint indicates that local white-throated needletail populations are unlikely to roost in the available vegetation, as they favour communities with tree hollows and dense vegetation. Whilst no records of this species have been recorded within the Development footprint, several nearby records have been identified in the vicinity, the nearest of which is approximately 2 km to the south (ALA 2013). Local records from Gurulmundi State Forest, Barakula State Forest and Condamine State Forest indicate that this species does frequent the region and has the potential utilise airspace over the Development footprint during its southern migration (nominally October to April).
Fork-tailed swift	The fork-tailed swift is a non-breeding migrant to Australia (DoE 2025a). When it arrives in Australia, the species is highly mobile, following low-pressure systems in search of aerial insects. They have been observed across various regions between spring through autumn; however, their seasonal preference varies across different regions. In Queensland, sightings are typically between October and February. The fork-tailed swift is predominantly aerial, flying from less than 1 m to at least 300 m above ground level (DoE 2025a). Within Australia, the species inhabits a wide range of environments, from inland plains,	**Possibly occurring** Considering the highly mobile and aerial nature of this species, it is likely that this species can utilise the airspace above the entire Development footprint as foraging habitat. There is currently not enough evidence to support the mapping of terrestrial vegetation communities as being utilised as roosting habitat. Whilst no records of this species have been recorded within the Project, several nearby records have been identified in the vicinity,

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
	foothills or in coastal areas and on occasion, well out to sea. They are commonly observed over dry or open habitats, including riparian woodlands and *Melaleuca* spp. swamps, low scrubs, heathlands and saltmarshes. The species is also known to occur over open grasslands and sandplains, open agricultural lands and both inland and coastal sand dunes. On occasion, the species is observed above rainforests, wet sclerophyll forests, open forests or over pine plantations. Current studies suggest that this species is likely to roost aerially, however there is a single record of this species roosting in trees, where they were observed in a bare, exposed emergent tree (DoE 2025a).	the nearest of which being approximately 12 km to the south (ALA 2019). Local records from Gurulmundi State Forest, Barakula State Forest and Condamine State Forest indicate that this species does frequent the region and has the potential utilise airspace over the Development footprint during its southern migration (nominally October to March).
Reptile Species		
Dunmall's snake	The distribution of the Dunmall's snake extends from near the Queensland border through the Brigalow Belt South and Nandewar bioregions, as far south as Ashford in New South Wales (DoE 2025c). In Queensland this species occurs primarily in the Brigalow Belt region in the south-eastern interior. Records indicate it occurs at sites at elevations between 200-500 m above sea level. The snake is extremely cryptic with very few observations being recorded. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park. Little is known about Dunmall's snake, however it is known to be uncommon within its modelled distribution (DoE 2014a). This species has been found in a broad range of habitats including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow; and other various Blue Spotted Gum, Ironbark, White Cypress and Buloke open forests and woodland associations on sandstone derived soils (DoE 2025c). This species is known to utilise a wide range of microhabitat features including, coarse woody debris of varying sizes, soil cracks and other cavities and abandoned termite mounds.	**Likely to occur** No records of this species have been recorded within the Development footprint however, sporadic records have been identified in the region surrounding the Development footprint, the nearest of which is approximately 7 km to the north-west (Arrow 2022). There are also records from around Miles to south of the Condamine River to the west near Yuleba State Forest. This species is very difficult to detect, even in areas of known habitat, and has been described as 'extremely secretive, rarely encountered, possibly genuinely scarce' (Wilson, 2022). Habitat assessments identified the presence of abundant small-medium sized scattered and semi-embedded timber, earth cracks and termite mounds that represent suitable shelter habitat for this species. The proximity of recent local records and the abundance of suitable microhabitat for this species indicate that Dunmall's snake Is likely to occur within the Project area.

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
	Little is known about the life cycle of this species, however it is known that they lay eggs rather than live young.	
Yakka skink	The yakka skink is endemic to Queensland where isolated populations have been identified throughout subhumid areas in the interior from St George in the south, to Coen and Cape York in the north (DoE 2014b). In the southern half of the brigalow belt it occurs near Rockhampton, south to St George and west to Chesterton Range National Park. The overall distribution of this species is extremely patchy, with populations also being detected along the Queensland/New South Wales border. This species has typically been found in open dry sclerophyll forest or woodland where they will often seek refuge among dense ground vegetation, large hollow logs, cavities in soil-bound root systems of fallen trees and beneath rocks (DoE 2014b). Observations have been made in the following Queensland Land Zones: 3, 4, 5, 7, 8, 9, 10 and 12 (DCCEEW 2023b). They are however extremely secretive and seldom venture far from shelter sites, where they retreat to at the first sign of disturbance. Their presence is often indicated by a shared site where they deposit their droppings.	**Unlikely to occur** The yakka skink is rare and scattered in the east of its range. There are two records within 50 km of the Development footprint, the nearest of which is 11 km to the west (ALA 1998) near Gurulmundi State Forest. Scattered populations have also been identified in the vicinity of Condamine State Forest and south of Yuleba State Forest. Yakka skink has never been recorded within the broader SGP area despite significant survey effort. Comprehensive habitat assessments and active searches were conducted throughout the entire Study area confirmed the lack of suitable microhabitat features required to support this species. The site lacked all large log piles, large hollow logs, rock piles, excavated soil mounds, suitable burrow systems or latrine sites. Whilst scattered coarse woody debris was observed, these were not considered to be large enough or consolidated enough to act as suitable habitat for this species. (This coarse woody debris was however considered in the assessment of suitable habitat for the Dunmall's snake (see above)). Whilst a single egernid scat was observed during these surveys, this was not found within the latrines characteristic of this species and was assessed as likely belonging to the more common *Ergernia striolata*. Whilst the Development footprint is characterised by dry sclerophyll forest vegetation, these communities are all relatively young and have been subjected to historical disturbance through vegetation clearing and recent bushfires. As such, these communities have not yet matured to a point where they can provide the large coarse woody debris or large log piles that are typically utilised by yakka skink populations. The small-medium sized coarse woody debris that was observed scattered across the

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
		Development footprint is unlikely to provide the necessary shelter characteristics required for this species. The lack of suitable microhabitat features mean the site unlikely to support yakka skink and the species is unlikely to occur within the Development footprint.
Flora Species		
Belson's panic	Belson's panic occurs within the southern Brigalow Belt, namely the Darling Downs area west of Toowoomba, near Oakley, Jondaryan, Bowenville, Dalby, Acland and Sabine, Quinalow, Goombungee, Gurulmundi and Millmerran. The species is also known to occur further west, between Miles and Roma (DoE 2025e). This species is also found on the north-western slopes and plains of New South Wales. It occurs at elevations between 200 to 250 m above sea level, typically within dry woodland habitats on nutrient poor- oils (such as soils derived from basalt) (DoE 2025d). The species is considered to be a shade-dependent species, where it is most abundant in shady locations beneath or between trees. This requirement enables the species to inhabit a broad range of vegetation communities. This species has been observed on rocky hills supporting White Box (*Eucalyptus albens*) and in Wilga (*Geijera parviflora*) woodlands, as well as on flat to gently undulating alluvial areas that are dominated by Belah (*Casuarina cristata*) forest. The species has been recorded occurring within Poplar Box (*Eucalyptus populnea*) communities (DEWHA 2008). There appears to be an association with Brigalow (*Acacia harpophylla*), Myall (*A. melville*), Weeping Myall (*A. pendula*) and Mountain Coolibah (*E. orgadophila*) communities, as well as on roadsides. Studies also indicate that the species is able to recolonise cleared or highly modified/disturbed areas, as it has been observed regenerating in patches of vegetation along roadsides (DoE 2025e).	**Unlikely to occur** While scattered populations have been identified in Barakula State Forest, around Miles airport and along the Warrego Highway (west of Miles), the closest record is approximately 28 km to the south (ALA 2009). Surveys across the Development footprint have not detected this species which is most commonly associated with cracking clay soils in this region and it is considered unlikely to occur.

Common and Scientific Name	Distribution and Habitat	Likelihood of Occurrence Outcome
Curly-bark wattle	*Acacia curranii* has disjunct NSW and Queensland populations. The only known Queensland population occurs in and adjacent to the Gurulmundi State Forest area of the Darling Downs, approximately 65 km north-west of Chinchilla. The Gurulmundi population is restricted to an area less than 20 km in diameter. Plants are known to occur in shrubby heaths, dry sclerophyll forests and semi-arid woodlands where they can occur as widely scattered thickets in very species-rich heathy scrub with emergent eucalypts. Queensland collections of curly-bark wattle as recorded in Herbrecs mostly occur in areas mapped as RE 11.7.5 shrubland on natural scalds on deeply weathered rocks.	**Unlikely to occur** The primary suitable habitat for this species is associated with the small area of RE 11.7.5 to the north of the Development footprint. This distinctive species is not present within this area and is not expected to occur.

As shown in **Table 6.1** the LoO assessment has found that nine threatened species and one migratory only species are likely or possibly occur in the Development footprint. These are:

- Corben's long-eared bat;
- Greater glider;
- Koala;
- South-eastern glossy black-cockatoo;
- Squatter pigeon;
- Diamond firetail;
- Dunmall's snake;
- Painted honeyeater;
- White-throated needletail; and
- Fork-tailed swift (migratory only).

The first seven of these are relevant to the Project due to the potential for the Project to impact each species (as detailed in **Section 9**). **Section 6.2** provides more detailed information about the distribution, ecology, habitat preferences for these species and quantifies the extent of habitat within and adjoining the Development footprint. The quality and importance of these habitats relative to habitat critical to survival of the species is also discussed. The key threats that are identified in the Conservation Advice for each species are noted. This relevant ecological information has been used in the subsequent significant residual impact assessments undertaken for these values (in **Section 9**).

The population and habitat characteristics of the remaining three (possibly occurring) species are such that the Project is unlikely to impact them. These characteristics are outlined in **Section 6.3**.

6.2 Population and habitat details for relevant MNES species

6.2.1 Corben's long-eared bat, *Nyctophilus corbeni* (Vulnerable)

6.2.1.1 Distribution, ecology and habitat

Corben's long-eared bat has a patchy distribution across south-central Queensland, central-western New South Wales, north-western Victoria, and eastern South Australia. Most of its range lies within the Murray–Darling Basin, with most records occurring inland of the Great Dividing Range (TSSC 2015a). The species inhabits a range of inland woodland vegetation types, typically such as *Eucalyptus* and *Callitris* woodland, *Allocasuarina* woodland, *Acacia harpophylla* (brigalow) woodland, *Casuarina* woodland, and *Angophora* woodlands. The species is also known to inhabit *Eucalyptus camaldulensis*, Coolibah and various types of mallee vegetation.

Within Queensland, the species can inhabit these diverse vegetation communities, however it is more frequently observed within vegetation communities comprising of box/ironbark *Eucalyptus* and *Callitris* species within a north-south belt along the western slopes and plains of New South Wales and southern Queensland (TSSC 2015a). The species tends to be more abundant within large and continuous tracts of woodland than in smaller, fragmented patches; suggesting that the species requires a large home range. It is also significantly more abundant in habitats that feature a well-developed tree canopy with a dense, cluttered understorey.

All members of this genus have broad wing and tail membrane surface that allows slow, highly manoeuvrable flight with foraging usually undertaken within several kilometres of their roosting site (Lumsden et al 2002). These bats forage at a low height, close to vegetation and around tree trunks, and also glean invertebrates from surfaces (Turbill and Ellis, 2006). These features suggest that *Nyctophilus* spp. are generally associated with forests, woodlands and tall shrublands that contain an abundance of feeding substrates in the first few metres above the ground and hollow bearing trees that provide suitable roosting conditions. As such, *N.corbeni* is generally considered to be 'clutter-adapted' and forest-dependent (Law et al, 2016).

Summer roosts of male *Nyctophilus* spp. are typically under exfoliating bark, whereas the roosts of females, which form small maternity colonies, are typically in tree hollows. In a study from *Callitris glaucophylla* forests in the Piliga, *N. corbeni* avoided roosting in open, thinned areas as predicted for a closed-space species but actively foraged in both cluttered and uncluttered forests (Law et. al., 2018). Law et al (2016) recorded capture of males up to 4 km from roost sites, with other studies recording males at foraging distances from roost of up to 7 km (Lumsden et al 2011).

There is little available information on this species' reproductive biology (TSSC 2015a). Breeding is likely to be seasonal, with pregnant and lactating females having been trapped in Queensland and New South Wales in November.

6.2.1.2 Habitat within the Development footprint

The conservation advice for Corben's long-eared bat does not provide a definition for 'habitat critical to the survival of the species', as such it is relevant to consider the broad definition as an area that is necessary:

- for activities such as foraging, roosting, breeding or dispersal
- for the long-term maintenance of the species
- to maintain genetic diversity and long-term evolutionary development
- for the reintroduction of populations or recovery of the species

The foraging of Corben's long-eared bat appears to be concentrated around patches of trees in the landscape which are likely used as roosting locations (under exfoliating bark or in tree hollows). The species is not known to venture far from these patches of vegetation, and as such, a 100 m buffer has been applied to all mapped vegetation communities that are dominated by a tree layer (which is only RE 11.5.1). The effect of this process indicates that the entire Development footprint likely provides suitable foraging habitat for this species, whereas suitable roosting is limited to areas of regrowth RE 11.5.1. Suitable habitat mapped for this species is shown on **Figure 6.1**.

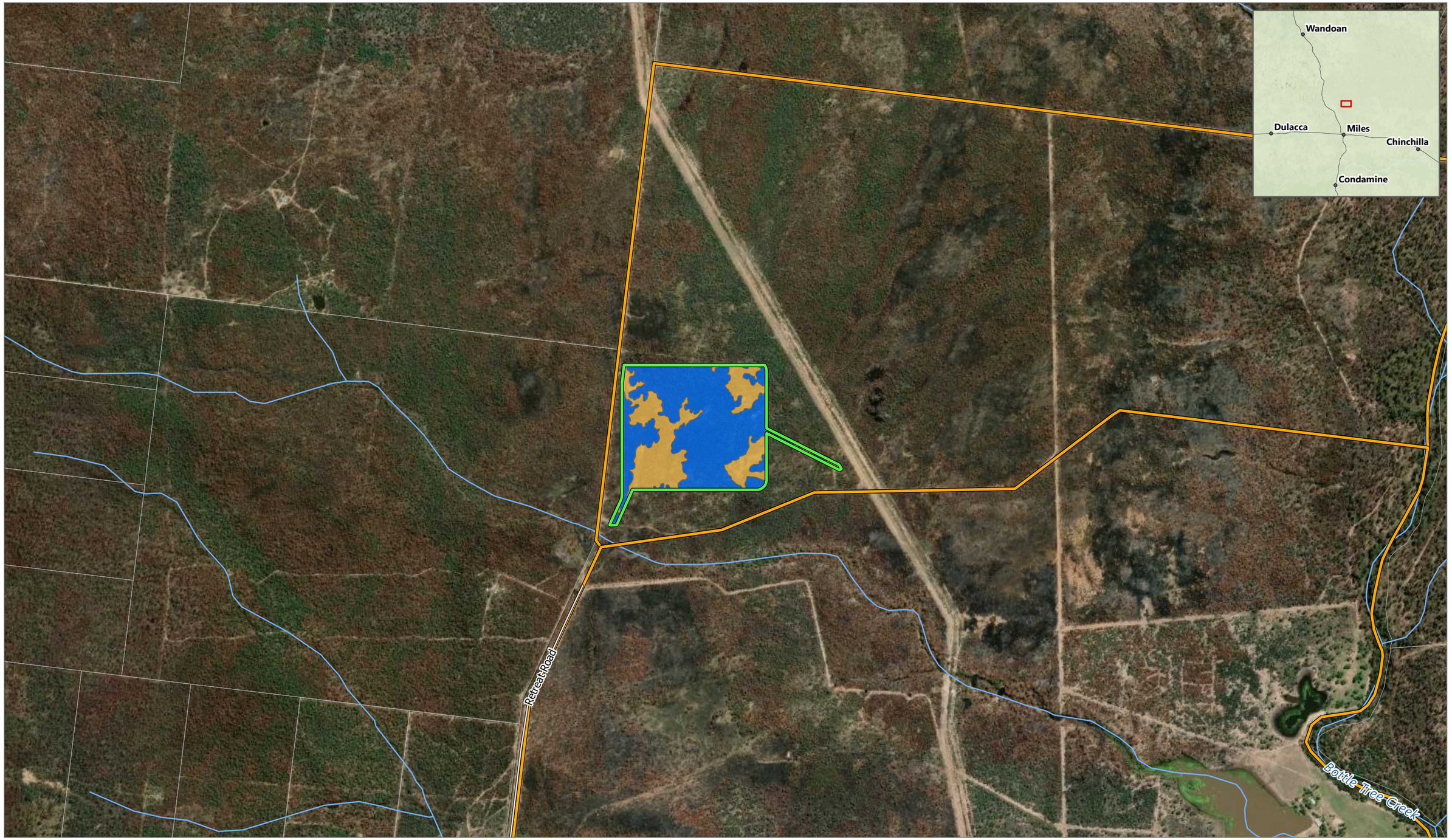
Whilst foraging and roosting habitat for Corben's long-eared bat has been described to some degree, there is still uncertainty in the scientific community around what areas are likely to be important for this species because they can utilise such a wide range of vegetated woodlands. To account for this, the Project has adopted a conservative definition of 'habitat critical to the survival of the species' which includes all mapped potential habitat for this species. As such, mapped potential roosting and foraging habitat within the Development footprint is considered to be 'habitat critical to the survival of the species'.

6.2.1.3 Important population

An important population of Corben's long-eared bat is not defined for the purposes of the EPBC Act. Consequently, it is relevant to refer to the broader EPBC Act guidelines, which define an important population of a vulnerable species as being one that is:

- A key source population either for breeding or dispersal;
- Necessary for maintaining genetic diversity; and/or
- Near the limit of the species' range.

Most species of *Nyctophilus* are thought to be sedentary and the slow, manoeuvrable flight that characterises this genus is not considered conducive to long distance flights (Lumsden, 1994). Foraging is generally undertaken within several kilometres of their roosting site (Lumsden *et al,* 2002). As such, the Development footprint may be utilised by a local population of this species however, due to the widespread distribution of similar habitat across the region, any local population is considered unlikely to be a key source population or necessary for maintaining genetic diversity, nor is the Development footprint near the limit of the species' range. As such, any population of Corben's long-eared bat in this location is not considered an important population.



- Local Road
- Watercourse
- Project Site
- Development Footprint
- Base Type Parcel
- Corben's Long-eared Bat Roosting and Foraging Habitat
- Corben's Long-eared Bat Foraging Habitat

SGP NORTH SOLAR FARM
Suitable habitat for the Corben's Long-Eared Bat
Figure 6.1

N

0 m 500

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6.2.1.4 Threats

Habitat loss, change and/or fragmentation is a primary factor contributing to the population decline of Corben's long-eared bat. This species is known to occur within forests, woodlands and tall shrubland vegetation. Historically, these habitats were cleared for industrial activities such as forestry, agriculture, and mining (TSSC, 2015; OEH, 2017). Habitat loss, change and fragmentation have flow on effects exacerbating other threatening processes, such as the absence of hollow-bearing trees as either roosting or nesting sites (TSSC, 2015; Lumsden *et al*, 2002). The loss of additional hollow habitat would be detrimental for the conservation of Corben's long-eared bat, resulting in increased competition and pressure (TSSC, 2015).

Bushfires threaten Corben's long-eared bat through direct mortality and the rapid reduction and change in their habitat and roosting/nesting sites. In Victoria, *Nyctophilus corbeni* is known to prefer long-unburnt, mallee vegetation (DCCEEW, 2015b). Additionally, altered fire regimes or increased fire frequency change the floristic composition and structure of the landscape, thus impacting the availability of appropriate prey for Corben's long-eared bats and their ability to use echolocation to communicate and hunt (Jemison *et al*, 2009; OEH, 2017).

As habitat for this species was traditionally cleared for forestry, mining, and agriculture; exposure to agrichemicals (either directly or through bioaccumulation) can be recognised as a key threatening process. However, it must be acknowledged that more data is needed to quantify the level of impact presented by agrichemicals (TSSC, 2015; OEH, 2017).

Other key threats include:

- Grazing (in uncleared habitat, by reducing foraging habitat and changing the structure vegetation communities)
- Predation (TSSC 2015a).

6.2.2 Greater glider, *Petauroides volans* (Endangered)

6.2.2.1 Distribution, ecology and habitat

The greater glider (southern and central) is found only in eastern Australia, where its area of occupancy has declined significantly since European settlement, primarily due to land clearing and subsequent loss of habitat. Its contemporary range extends from around Proserpine in north Queensland, through New South Wales and the Australian Capital Territory, to the Wombat State Forest in central Victoria. The species is also limited by elevation, occurring at altitudes up to 1,200 m above sea level (DCCEEW 2022b).

The greater glider (southern and central) is a solitary, nocturnal, arboreal marsupial that inhabits Eucalypt forests and woodlands within eastern Australia. It is most abundant within tall, montane, moist eucalypt forests with relatively old trees and an abundance of tree hollows (DCCEEW 2022b). This species has a preference for large hollows with a diameter greater than 10 cm. While suitable hollows can occur in both live trees and stags, this species demonstrates a preference for hollows within live trees, when there is adequate availability. Individual gliders may have multiple denning trees within their home range. Even in seemingly continuous areas of potentially suitable habitat, only a proportion of forest in potential habitat may meet the species' specific habitat requirements. These habitat types vary in relation to their structural attributes of the forest overstorey and the variability of food resources.

They are primarily folivorous, with a diet comprising mostly eucalyptus leaves, buds and flowers from a restricted range of eucalypt species (Eyre et. al. 2022b). While tree species favoured by the greater glider varies regionally, they tend to prefer forests with a diversity of eucalypt species, due to seasonal variation in growth and nutrient content (DCCEEW 2022b). Approximately 85% of the greater glider's water requirements are provided by consuming leaves, with the remaining water likely obtained from dew and nectar.

Greater gliders typically move through woodland and forest habitat by gliding from tree-to-tree without coming to ground. They are capable of maximum glide angle of between 31 to 40 degrees from horizontal (Taylor & Goldingay 2009), with a glide angle of 40 degrees roughly correlating to a maximum glide distance of 1.2 times the height of the canopy. Therefore, if trees are approximately 30 m high, greater gliders are unlikely to cross clearings greater than approximately 36 m, and if trees are approximately 20 m high, the animals would be unlikely to cross clearings greater than approximately 26 m. This species also has relatively low reproductive rates which can render small and

isolated populations prone to extinction (DCCEEW 2022b). Females have been recorded giving birth from March to June.

6.2.2.2 Habitat within the Development footprint

Habitat critical to the survival of the greater glider (southern and central) is defined in the conservation advice for this species (DCCEEW 2022b) as:

- Large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species' preferred food species in a particular region
- Smaller or fragmented habitat patches connected to larger patches of habitat that can facilitate dispersal of the species and/or that enable recolonization
- Cool microclimate forests/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes)
- Areas identified as refuges under future climate change scenarios
- Short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.

Habitat meeting any one of the criteria above is considered habitat critical to the survival of greater glider (southern and central), irrespective of the current abundance or density of greater gliders or the perceived quality of the site. Eucalypt areas currently unoccupied by the greater glider (southern and central) may still represent habitat critical to survival, if the recruitment of hollow-bearing trees as the forest ages could allow the species to colonise these areas and ensure persistence of a subpopulation (DCCEEW 2022b).

Table 6.2: Assessment against criteria defining 'habitat critical for survival' of the greater glider

Large, contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species preferred food species in a particular region.	**No** The Development footprint comprises a patch of immature regrowth vegetation approximately 70 ha in size. The average DBH of trees throughout is <30 cm and large trees >50 cm DBH are largely absent. Eyre et al (2022b) define preferred foraging trees that characterise greater glider habitat in the Brigalow Belt bioregion. Of the 48 eucalypt species identified, three (*Eucalyptus crebra*, *E. fibrosa* and *E. populnea*) have been recorded in areas mapped as regrowth RE 11.5.1.
Smaller or fragmented habitat patches connected to larger patches of habitat that can facilitate dispersal of the species and/or that enable recolonisation.	**No** Vegetation in the Development footprint forms part of an intact corridor of native vegetation that has the potential to facilitate north-south movement of this species however, the absence of large hollow-bearing trees in the Development footprint reduces its utility for greater gliders. With a combined width of approximately 70 m, the existing and proposed gas pipeline easements to the east of the Development footprint also represent a barrier to east-west dispersal for this species.
Cool microclimate forests/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes)	**No** The Development footprint is characterised by dry open woodland communities on sandy soils and does

	not contain any cool microclimate forest/woodland areas.
Areas identified as refuges under future climate change scenarios.	**No** The Development footprint is not identified as a refuge under future climate change scenarios.
Short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.	**No** The Development footprint does not represent a short-term or long-term fire refuge.

In light of the above, the marginal/low value habitat in the Development footprint is **unlikely to represent 'habitat critical to the survival of the species'** and is instead considered as 'potentially suitable foraging and dispersal habitat' based on the presence of preferred feed tree species. Potential foraging habitat for greater glider is shown in **Figure 6.2**.

6.2.2.3 Threats

Key threats to this species include climate change and related impacts, such as the increased intensity and frequency of bushfires and increased temperatures and change to rainfall patterns. Other threats might also be present, such as unauthorised clearing and degradation of habitat and habitat fragmentation, mortality from vehicle strike, hyper-predation by owls (e.g. the powerful owl (*Ninox strenua*)) and predation by European foxes (*Vulpes vulpes*) and feral cats (*Felis catus*), competition from *Cacatua galerita* (Sulphur-crested Cockatoos) and barbed wire fencing (entanglement) (DCCEEW, 2022b).

Other key threats for the greater glider include (DCCEEW 2022b):

- Inappropriate fire regimes
- Timber harvesting.

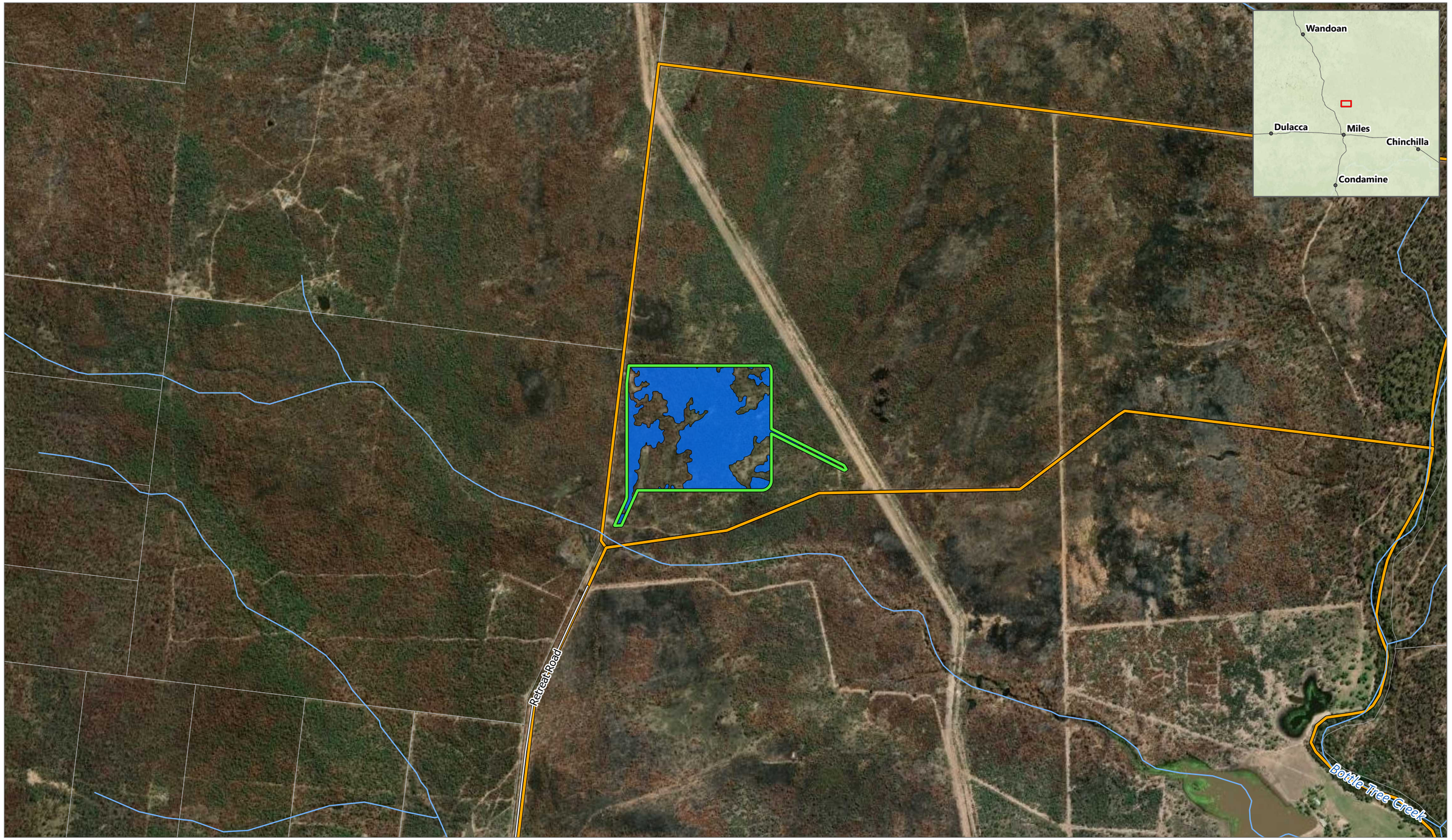
6.2.3 Koala, *Phascolarctos cinereus* (Endangered)

6.2.3.1 Distribution, ecology and habitat

Koalas are widespread across Queensland, occurring in patchy and often low-density populations across the different bioregions. They occur as far north as the Einasleigh Uplands and Wet Tropics bioregions with records to the south and west in the Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North, Brigalow Belt South and South-Eastern Queensland where they are most frequently sighted (DAWE 2022a). The extent of occurrence for the koala is approximately 1,665,850 km^2 and the area of occupancy is approximately 19,428 km^2.

Koalas are tree-dwelling, obligate folivores with a highly specialised diet. Their diet is defined by the availability and palatability of a limited variety of *Eucalyptus*, *Corymbia* and *Angophora* species (DAWE 2022a). Local factors such as population density, food quality and availability, soil type and climate all influence the timing of breeding.

Several studies have broadly recognised the koala's dispersal capabilities across cleared land (Melzer 1995; White 1999; Dique et al. 2003; Matthews et al. 2016). In addition to regular movements across the ground between trees within their own home ranges, koalas, particularly subadult males but also females, are known to generally disperse across distances of 1 to 3 km (but sometimes over 10 km).



Watercourse
Local Road
Project Site
Development Footprint
Greater Glider Foraging Habitat
Base Type Parcel

SGP NORTH SOLAR FARM
Suitable habitat for the Greater Glider
Figure 6.2

N
0 m 500

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The current definition of habitat for the koala includes land that has attributes that support this species (such as the presence of feed trees, connectivity to other habitat and proximity to areas with known koala populations) (DAWE 2022a). Koala habitat often includes:

- Forests or woodlands, especially with a higher proportion of feed tree species, and may include remnant or non-remnant vegetation
- Roadside and railway vegetation and paddock trees
- Safe intervening ground for travelling between trees and patches to forage, shelter and reproduce
- Access to vegetated corridors or paddock trees to facilitate movement between patches

Breeding and foraging habitat for the species includes REs dominated or sub-dominated by *Eucalyptus*, *Corymbia* and/or *Angophora* species (remnant and regrowth). Areas of woody vegetation that are mapped as non-remnant by the State vegetation mapping also provide potential breeding and foraging habitat for the species. Whilst no individuals have been observed within the Development footprint, nearby records have been identified, the nearest and most recent of which being approximately 26 km to the north-east (ALA 2017).

6.2.3.2 Habitat within the Development footprint

Habitat critical to the survival of the species is defined in the conservation advice for the koala (DAWE, 2022a). An assessment of the Development footprint against the criteria set out in this conservation advice is provided in **Table 6.3**.

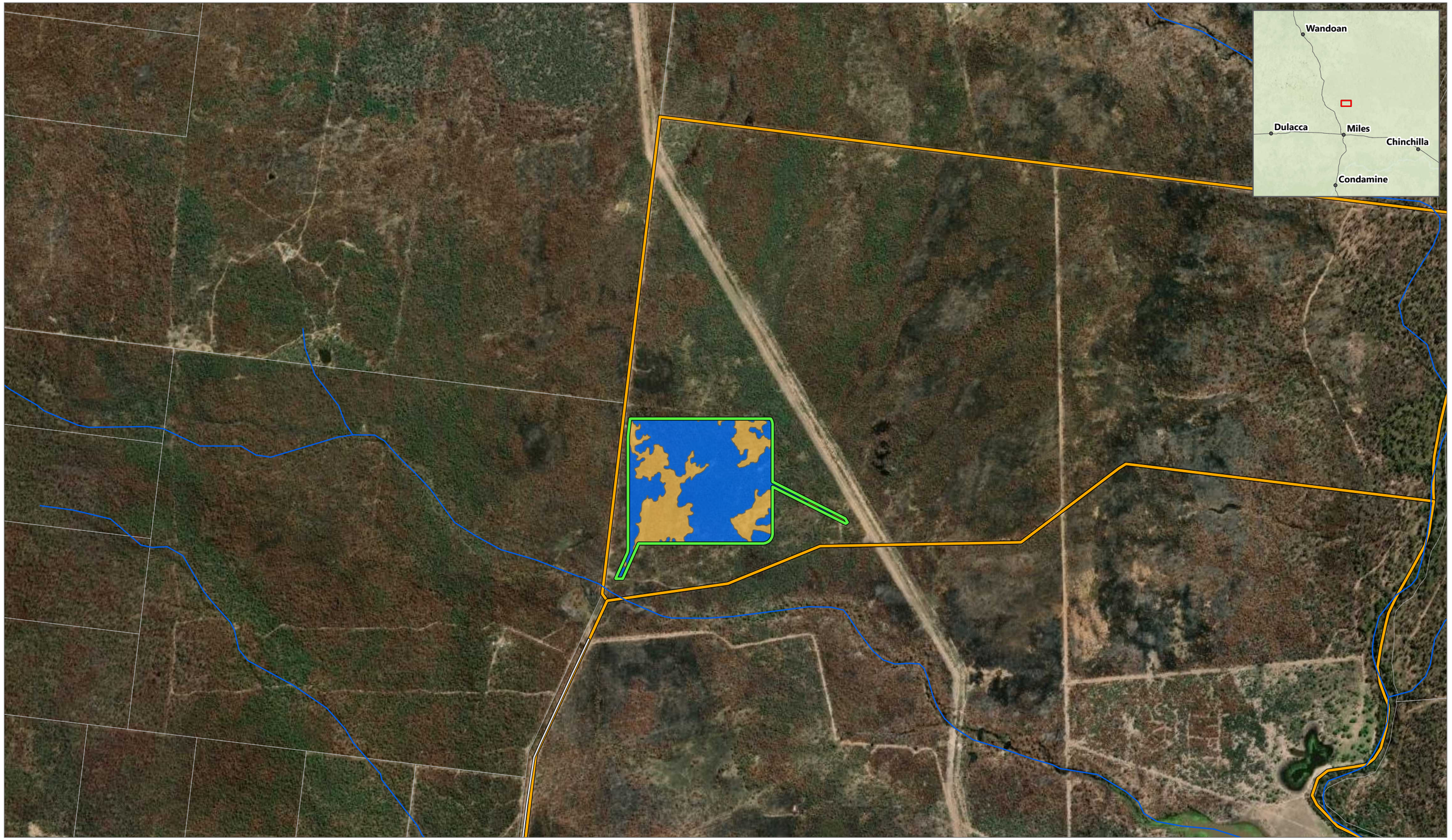
Table 6.3: Assessment against criteria defining 'habitat critical for survival' of the koala

Critical habitat consideration	Project assessment
Does the Project contain habitat that is used during periods of stress (e.g. flood, drought, or fire)?	**No**. Vegetation within the Development footprint is characterised by regrowth RE 11.5.1 that has been heavily impacted by historical clearing and recent fire. However, this vegetation does contain locally important koala trees (LIKT) and ancillary habitat trees (AHT) as defined by Youngentob et al (2021) including: • *Eucalyptus crebra* • *E. populnea* • *E. exserta* • *E. fibrosa*; and • *A. salicina*. While the presence of LIKT represents a potential foraging resource, the nature of the Development footprint and recent fire damage means it is unlikely to represent habitat used during periods of drought and fire (though this could be subject to change over time). It is conceivable that the Development footprint may be used as a refuge in times of flood though there are higher quality remnant habitats available elsewhere in the area surrounding the Project.
Does the Project contain habitat that is used to meet essential life cycle requirements (e.g. foraging, breeding, social behaviour, dispersal)?	**Yes** Regrowth eucalypt woodlands in the Development footprint are characterised by LIKT as described above which indicates the area could provide breeding and foraging resources for this species. Non-remnant areas could facilitate dispersal of a locally occurring koala population.

Critical habitat consideration	Project assessment
What is the extent to which the habitat present within the Project site is used by important populations?	**No** Given that no historical koala records have been identified within the Development footprint and there was no evidence of use recorded, the current extent to which this suitable habitat is being utilised by koalas is unclear. It is unlikely however, that if a local population is present, that this habitat would not be utilised to some extent.
Does the Project contain habitat that is necessary to maintain genetic diversity and long-term evolutionary development?	**No** Considering that no historical koala records have been identified within the Development footprint, and the abundance of adjacent habitat associated with nearby state forests, including Barakula State Forest, Binkey State Forest, and Gurulmundi State Forest, it is unlikely that the habitat within the Development footprint is necessary to maintain the genetic diversity and long-term evolutionary development of the koala.
Does the Project contain habitat that is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements?	**No** The Development footprint does provide vegetated cover between remnant patches to the east and west. It is not the only vegetation to do so however, and more significant corridors are available to the north and south of the Development footprint. As such, the Development footprint is not considered 'necessary' to allow the species to move freely between sites used to meet essential life cycle requirements.
Is the habitat within the Development footprint necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation?	**No** Analysis of local records indicate that a regional koala population, or several more localised populations, has continued to persist in the environment. As the species already occurs in the broader area, is unlikely that the Development footprint is necessary to ensure the long-term future of the regional koala population through reintroduction or re-colonisation.
Are there any other ways in which the habitat present within the Project site might be critical to the survival of a listed threatened species or a listed threatened ecological community (EPBC Act)?	**No** Considering the high connectivity of the surrounding vegetation, the limited quality of available habitat and the absence of records within the Development footprint, it is considered unlikely that the habitat present within the Project site would be critical to the survival of the koala through means not addressed above.

In light of the above, areas of regrowth RE 11.5.1 are considered likely to provide suitable breeding and foraging opportunities for koala, though this species would be expected to be present only in low densities. However, cleared areas are likely to facilitate dispersal of locally occurring koala populations.

All mapped habitat in the Development footprint is considered to **represent 'habitat critical to the survival'** for the koala. Suitable habitat for koala is shown in **Figure 6.3**.



- Local Road
- Watercourse
- Project Site
- Development Footprint
- Base Type Parcel
- Koala Breeding and Foraging Habitat
- Koala Dispersal Habitat

SGP NORTH SOLAR FARM
Suitable habitat for the Koala

Figure 6.3

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N

0 m 500

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6.2.3.3 Threats

Key threats to this species include climate change and related impacts, such as the increased intensity and frequency of bushfires. Other threats might also be present, such as unauthorised clearing and degradation of habitat, mortality from vehicle strike and wild dogs attacks, and from diseases affecting the koala, e.g., from the koala retrovirus (KoRV) and Chlamydia (*Chlamydia pecorum*).

6.2.4 South-eastern glossy black-cockatoo, *Calyptorhynchus lathami lathami* (Vulnerable)

6.2.4.1 Distribution, ecology and habitat

The south-eastern glossy black-cockatoo is uncommon but widespread and can be found from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria (DCCEEW 2022a). Their distribution is continuous through the forested parts of the Great Dividing Range but becomes more scattered inland, to as far west as the Riverina in New South Wales.

South-eastern glossy black-cockatoos feed almost exclusively on the seeds of sheoaks (*Allocasuarina* spp and *Casuarina* spp), usually relying on one or two species within a region (DCCEEW 2022a). This preference may explain the patchy distribution of the subspecies in parts of its range. Alongside the already narrow dietary requirement, the birds also show strong preference to individual feed trees and will not feed on many other proximate trees of the same species.

They are hollow nesters, utilising large hollows in both living and dead eucalypt trees. They have a clutch size of one and females are entirely responsible for incubation and brooding, whilst the males keep them fed (DCCEEW 2022a). The movement patterns and ranging behaviour of the south-eastern glossy black-cockatoos are poorly understood, with information suggesting that they are seasonal migrants in southeast Queensland, likely as a response to changing of resource availability or breeding requirements.

6.2.4.2 Habitat within the Development footprint

Specific areas of habitat critical to the survival of the south-eastern glossy black-cockatoo have not been identified within the conservation advice (DCCEEW 2022a). However, the conservation advice identifies the following as features of 'habitat critical for survival' for the south-eastern glossy black cockatoo:

- South-eastern glossy black-cockatoos rely on nine species of sheoaks for foraging, with species used varying depending on the region. In southeast Queensland and northeast New South Wales they have shown preference for black sheoak (*A. littoralis*) and forest sheoak (*A. torulosa*), although there are also records of them feeding on stringbark sheoak (*A. inophloia*), coastal sheoak (*C. equisetifolia*), and to a lesser extent river sheoak (*C. cunninghamiana*) and swamp sheoak (*C. glauca*) during limited times of the year.
- The majority of the nesting hollows were in narrow-leaved ironbark (*Eucalyptus crebra*) but other species included blue-leaved ironbark (*E. nubile*) and Blakely's red gum (*E. blakelyi*). All potential nesting hollows were in large hollow bearing trees. Suitable nesting locations are typically within 1 km of their primary feed tree species, and 200 m from permanent water.

The conservation advice notes that both recent survey data and historical records need to be considered when assessing the relative importance of a region for the species; as their seasonal movements are poorly understood, areas that constitute habitat critical to the survival might not have birds in any one year. The lack of mature vegetation and permanent water resources within the Development footprint suggests that it is unlikely to contain any suitable roosting habitat for this species. No large hollows (equal to or larger than 10 cm) were observed during surveys across the Project. As such, the Project has been mapped as containing potential foraging habitat only.

Habitat assessments and vegetation mapping undertaken across the Development footprint identified an abundance of buloke (*Allocasuarina luehmannii*) within regrowth RE 11.5.1 communities. While not listed as a preferred feed tree species *A. luehmannii* is thought to be an occasional food source in inland NSW and may be used in some years (DCCEEW, 2022). As such, the Development footprint has been mapped as potential foraging habitat for this species.

Despite a clear definition for suitable foraging and roosting habitats, the conservation advice for the south-eastern glossy-black cockatoo (DCCEEW 2022a) does not provide a definition of 'habitat critical to the survival of the species'. To account for this, the Project has adopted a conservative approach which includes all mapped habitat for this species within the Development footprint. As such, mapped foraging habitat within the Project is considered to be 'habitat critical to the survival of the species' Suitable habitat for this species is shown on **Figure 6.4**.

6.2.4.3 Important population

Important populations for the south-eastern glossy black-cockatoo have not been explicitly defined in the conservation advice. In fact, the identification of such populations is listed as a key conservation and management priority. It is also important to note that the distribution of the south-eastern glossy black-cockatoo (*Calyptorhynchus lathami lathami*) and northern glossy black-cockatoo (*Calyptorhynchus lathami erebus*) "blend" from about Hervey Bay to Carnarvon National Park. Any individuals occurring in the vicinity of the Development footprint are far enough away from the "blending zone" and are therefore within the distribution of the C. *lathami lathami* subspecies to not be considered important for maintaining genetic diversity or the range of occurrence of the species.

It is therefore considered unlikely that any locally occurring populations could constitute an 'important population' for this subspecies.

6.2.4.4 Threats

The main threat causing the decline of the south-eastern glossy black cockatoo is habitat loss, degradation, and fragmentation. Historical land clearance was the main cause of the decline of glossy black-cockatoo populations in the past, leading to the loss of both feeding and breeding habitats. Inappropriate fire management may also be a key threat as too frequent or too intense burning may result in feeding habitat being unsuitable for 10 years or more. Conversely, a recent study also shows that habitat that has been unburnt for a long period of time is also lower in quality and is used less by glossy black-cockatoos (Delzoppo et. al., 2021).

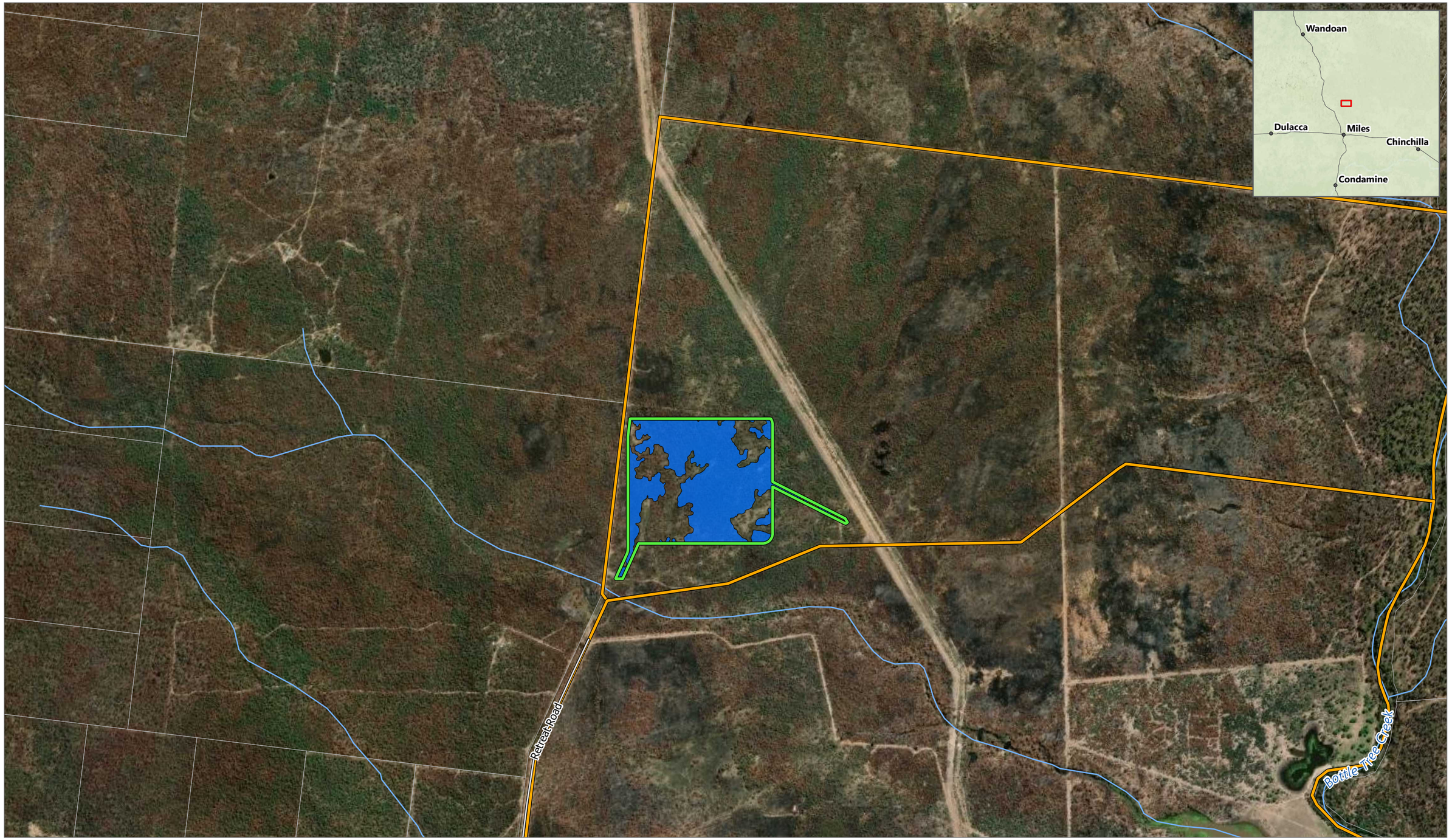
A major aspect of habitat loss is the loss of large hollow-bearing trees which provide nest sites as large hollows may take centuries to form (Gibbons and Lindenmayer, 2002). When hollow availability is limited, competition for hollows increases which is harmful in itself and may also amplify otherwise minor threats such as nest predation and the transmission of diseases.

6.2.5 Squatter pigeon (southern), *Geophaps scripta scripta* (Vulnerable)

6.2.5.1 Distribution, ecology and habitat

The squatter pigeon (southern) is a ground foraging granivore which can utilise a wide range of open-forest to sparse open-woodland and scrub habitats which are typically dominated in the overstory by eucalypt species but can also be dominated by *Acacia* species, *Callitris* species and *Melaleuca* species, or tussock grasslands (DoE 2025b; Lloyd et al 2025). The combined distribution of the northern and southern subspecies of squatter pigeon extends over a latitudinal distance approaching 2,000 km, from Archer River near Aurukun on Cape York Peninsula to far northern NSW (DoE 2025b). The distribution of the southern subspecies extends south from the Burdekin-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville in Queensland.

Areas of suitable foraging habitat were previously linked to flat to undulating plains and foothills (land zone 5) and lateritic (duplex) soils on low 'jump-ups' and escarpments (land zone 7) vegetation (DoE 2025b), but are now thought to be more strongly associated with alluvial plains across all bioregions (land zone 3) (Lloyd et al 2025). A similar observation was made regarding suitable breeding habitat which was previously liked to land zone 5 and 7, however a recent analysis of records confirmed that breeding can occur across several land zones (3, 5, 8, 11) (Lloyd et al 2025). Consequently, it is likely that this subspecies can nest within any land zone that is located close to foraging habitat and a permanent water source. Despite this however, their known preference for sandy soils suggests that they are less likely to use land zone 4 (clay plains) for foraging and nesting. This subspecies is typically associated with gentle slopes across all land zones.



Local Road
Watercourse
Project Site
Development Footprint
Base Type Parcel
South-eastern Glossy Black-Cockatoo Foraging Habitat

SGP NORTH SOLAR FARM
Suitable habitat for South-Eastern Glossy Black-Cockatoo

Figure 6.4

N
0 m 500

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Like other granivorous birds inhabiting arid to semi-arid environments, squatter pigeons must drink regularly, possibly daily, and are described as being found nearly always near permanent water (Lloyd et al 2025). Previous advice suggested that foraging habitat was likely located within 3 km of permanent water and breeding habitat was located within 1 km (DoE 2025b), however a recent analysis of records suggests this is more likely to be within 1.7 km and within 500 m of permanent water respectively (Lloyd et al 2025). Squatter pigeon nests consist of a shallow depression scraped into the ground and sparsely lined with grass, typically underneath grasses, shrubs or other microhabitat features (DoE 2025b).

Ground covering vegetation in suitable foraging and breeding habitat is patchy, consisting of native perennial tussock grasses or a mixture of perennial tussock grasses and low shrubs and/or forbs (DoE 2026a). Previous estimates of preferred groundcover vegetation rarely exceeded 33% (DoE 2025b), whereas more recent estimates suggest that the quantity of groundcover vegetation is likely to vary depending on the type of vegetation community (remnant vs regrowth) and species composition, and can range anywhere between approximately 20% and 60%, but can also occasionally be higher (Lloyd et al 2025). Furthermore, squatter pigeons are commonly observed foraging along the sides of roads, tracks, within stock yards and around cattle troughs where they also drink (DoE 2025b).

It is estimated that approximately 95% of the squatter pigeons diet consists of seeds (primarily from low vegetation such as grasses, herbs and shrubs (DoE 2025b). Given that foraging resources are likely to influenced by rainfall patterns from year to year, the southern subspecies is likely to be sedentary where water and foraging resources are reliable in the local region (DoE 2025b). When these resources are unavailable, this subspecies may disperse locally or regionally along vegetated corridors in search of other foraging resources which also provide access to permanent water sources. There is also some evidence to suggest that this subspecies may migrate (either locally or regionally), however this is difficult to substantiate (DoE 2025b).

6.2.5.2 Habitat within the Development footprint

Squatter pigeons are highly reliant on groundcover vegetation of open woodland communities in proximity to permanent water sources (such as farm dams and permanently flowing creeks). According to a recent review by Lloyd *et al* (2025), suitable habitats within 1.7 km of a perennial water source are important for foraging and those within 500 m of a perennial water source are important for nesting. Habitat within the Development footprint retains the characteristics of suitable foraging habitat as defined by Lloyd *et al* in that it:

- is located within 1.7 km of a permanent water source (in the form of a farm dam to the north-west of the Project); and
- contains eucalypt open woodlands (regrowth RE 11.5.1) with a patchy groundcover and vegetation cover ranging between 20% and 60%.

Table 6.4 presents a summary of squatter pigeon records within 50 km of the broader SGP area compiled by EcoSmart Ecology in October 2024. Records drawn from the Atlas of Living Australia (which includes Wildnet records) and e-bird (32 records in total) were filtered to exclude those prior to 1975 or without date. Inaccurate records (i.e. precision >2,000m) were retained for the assessment.

Table 6.4: Post-1975 squatter pigeon records within 50 km of the SGP (EcoSmart, October 2024)

Year	No. Individuals	RE*	Distance from SGP (km)	Notes
1997	Not recorded	11.7.6	Within SGP	Roadside
	Not recorded	Non-remnant	7.8	
1999	1	Non-remnant	31.8	
2012	2	11.7.7	Within SGP	Roadside
2013	1	11.9.5/11.9.10	3.5	Record accuracy low, close to roadside
2016	Not recorded	Non-remnant	0.4	Roadside

Year	No. Individuals	RE*	Distance from SGP (km)	Notes
2016	1	11.7.7/11.7.5	24.9	Roadside
2019	Not recorded	Non-remnant	5.7	Roadside
2020	1	11.5.1/11.7.4	15.9	Roadside
2021	2	11.5.1	11.1	Roadside
2022	1	11.10.1/11.7.5/ 11.5.20	48.8	Roadside

Despite the abundance of suitable habitat in the region, this data highlights the scarcity of squatter pigeons over the last 50 years, with only two sightings within the broader SGP and nine in the surrounding area. This is despite a marked increase in ecological research in the region driven by Arrow CSG and other coal seam gas proponents.

Notably, the majority of these records involve single birds with few sightings of pairs or groups that might indicate breeding activity. Furthermore, there are no clusters of sightings suggesting regular occurrence or consistent habitat use. Taken together, this suggest that the squatter pigeon is rare in and around the SGP with most occurrences involving solitary birds.

Nonetheless, as habitat within the Development footprint retains the characteristics of a suitable foraging resource, it meets the definition of 'habitat critical for survival' (as per the Significant impact Guidelines, DOE 2013) and is mapped as 'potential foraging habitat' in **Figure 6.5**.

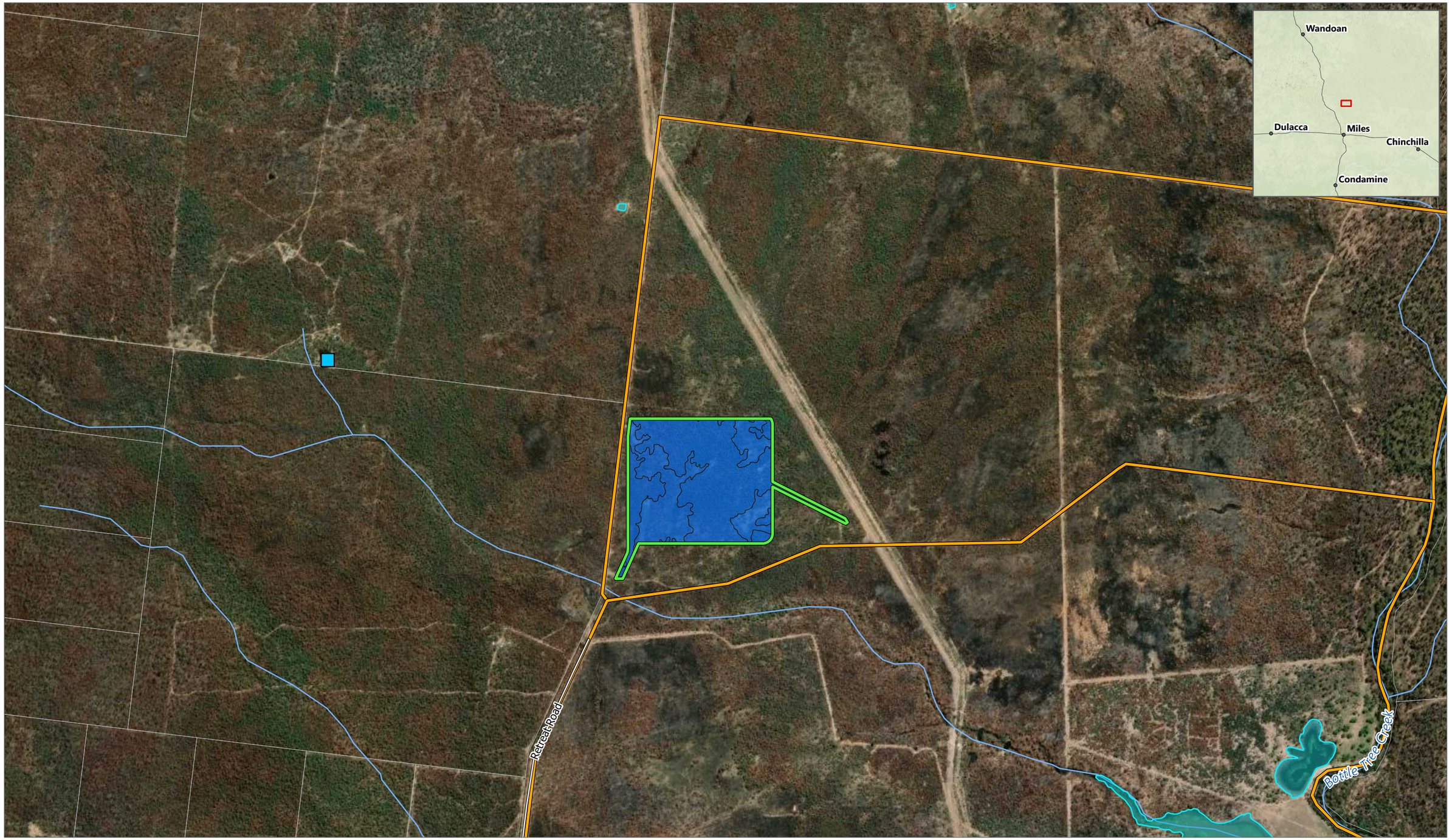
6.2.5.3 Important population

The conservation advice (TSSC 2015b) and threatened species profile (DoE 2025b) describe an important population of the squatter pigeon (southern) as being any populations located along the southern boundary of this subspecies distribution. Their distribution is slowly contracting northwards and therefore all small, relatively isolated and sparsely distribution populations occurring south of the Carnarvon Ranges in central Queensland are considered to be important sub-populations for this subspecies. Therefore, any squatter pigeon occurring the vicinity of the Development footprint may be part of an important population.

6.2.5.4 Threats

The combined effect of habitat loss and degradation by clearing and grazing, and predation by foxes and cats, is believed to have caused the decline in squatter pigeon (southern) during the late 19th and early 20th centuries in the southern extent of its range. Threat abatement plans for feral cats, competition and land degradation by rabbits, and predation by the European red fox are listed as relevant to the squatter pigeon (southern).

The current main threats to the squatter pigeon (southern) are the loss and fragmentation of habitat due to clearing for agricultural purposes, the degradation of habitat by overgrazing by domesticated herbivores, especially the sheep and cows, the degradation of habitat by invasive weeds, such as buffel grass (*Cenchrus ciliaris*), and predation by numerous avian and terrestrial predators (including feral cats and foxes) (DoE 2025b). The above threats are present within the Development footprint, particularly historical land clearing and grazing.



Farm Dam
Highway
Main Road
Local Road
Watercourse
Project Site
Water Reservoirs
Base Type Parcel
Potential Squatter Pigeon Foraging Habitat

SGP NORTH SOLAR FARM

Suitable Habitat for Squatter Pigeon

Figure 6.5

N

0 m 500

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6.2.6 Diamond Firetail, *Stagonopleura guttata* (Vulnerable)

6.2.6.1 Distribution, ecology and habitat

Diamond firetails occur on the southeast mainland of Australia from southeast Queensland to Eyre Peninsula, South Australia, and about 300 km inland from the sea (DCCEEW 2023a). Their range once extended to north Queensland inland from Cardwell, but they now occur only in the south of the state.

This species occurs in *Eucalypt*, *Acacia* or *Casuarina* woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (DCCEEW 2023a). They tend to prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover where they flock in groups up to 40 individuals or more. They are known to roost in dense shrubs or in small nests built especially for roosting.

Diamond firetails feed predominantly at ground level, on ripe and partly-ripe grass and herb seeds, green leaves and insects. As such, individuals are often observed hopping around on the ground. Between August and January, groups separate into small colonies to breed. Bottle-shaped nests made from green grass blades and stems lined with fine grasses and feathers are constructed. These nests are often secured to the base of larger stick nests of birds of prey to help protect their young. Nests are also constructed among the prickly foliage of shrubs.

6.2.6.2 Habitat within the Development footprint

Habitat critical to the survival of the diamond firetail has been defined in the conservation advice (DCCEEW 2023a) and includes areas of:

- *Eucalypt*, *Acacia* or *Casuarina* woodlands, open forests and other lightly timbered habitats
- Low tree density, few large logs and little litter cover but high grass cover for foraging, roosting and breeding
- Drooping she-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges.

Considering the broad range of woodland vegetation types that this species can utilise, the entire Development footprint (61.9 ha) is considered to be potential breeding and foraging habitat for this species and habitat critical to the survival of the species. As such, no mapping has been prepared for this species.

6.2.6.3 Important population

Important populations for the diamond firetail have not been explicitly defined in the conservation advice (DCCEEW 2023a). When the currently modelled distribution and recent historical records of this species are considered (eBird 2025; DCCEEW 2023a), it appears that records identified in the vicinity of the Development footprint are likely near the northern edge of this species modern distribution. In accordance with the Significant Impact Guidelines (DoE 2013), populations that are near the limit of a species range are considered to be 'important populations'.

6.2.6.4 Threats

Key threats for this species include (DCCEEW 2023a):

- Habitat loss caused by land clearing
- Invasive plants that replace native perennial grasses such as African lovegrass (*Eragrostis curvula*)
- Habitat degradation from livestock and invasive species such as the European rabbit (*Oryctolagus cuniculus*)
- Increase in frequency, scale or intensity of fire
- Territorial competition with noisy miners (*Manorina melanocephala*)
- Predation by pied currawongs (*Strepera graculina*).

6.2.7 Dunmall's snake, *Furina dunmalli* (Vulnerable)

6.2.7.1 Distribution, ecology and habitat

Dunmall's snake is confined to the Brigalow Belt bioregion of south-eastern Queensland and north-eastern New South Wales occurring north to Clermont and near Rockhampton. Most records are from the Dalby-Tara area of the Darling Downs (Hobson 2012). The species is very rarely encountered, even in areas of known habitat and has been described as 'extremely secretive, rarely encountered, possibly genuinely scarce' (Wilson 2022).

Limited information is available on habitat preferences of the Dunmall's snake. It has been recorded from a wide range of habitats including forests and woodland dominated by brigalow (*Acacia harpophylla*) and other acacias, cypress (*Callitris* sp.) or buloke (*A. leuhmanii*) on black alluvial cracking clay and clay loams (Covacevich et al. 1998; Stephenson and Schmida 2007; Brigalow Belt Reptiles Workshop 2010; Hobson 2012). It also occurs in spotted gum (*Corymbia citriodora*) and ironbark (*Eucalyptus crebra*) on sandstone-derived soils. However, its preferred habitat appears to be brigalow growing on cracking black clay and clay loams (Chapple et al, 2019).

Captive specimens indicate that Dunmall's snake is a nocturnal species, sheltering under fallen timber and in deep soil cracks and other cavities. Its diet consists of small skinks and geckos (TSSC 2014). It is thought to be terrestrial and lays eggs rather than live young.

6.2.7.2 Habitat within the Development footprint

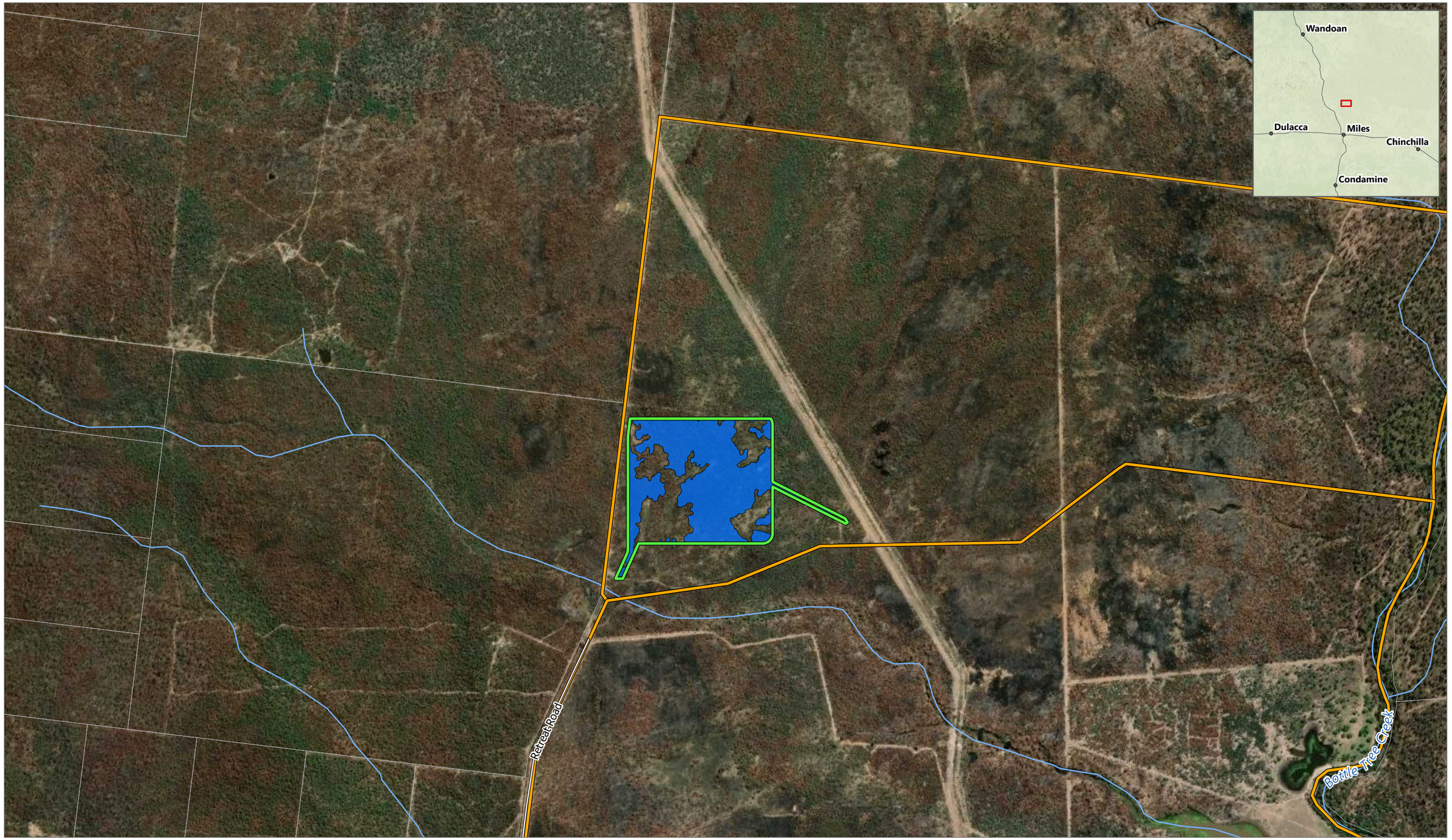
Whilst the Development footprint is not located within an area that this species is 'Known/Likely to occur' in accordance with the draft referral guidelines (DCCEEW 2023b), it is situated in the middle of this species known distribution within Queensland. Furthermore, the Project is located within a broad area of contiguous vegetation (which includes Barakula State Forest) and forms part of several regional and statewide biodiversity corridors. This species has been recorded in a broad range of habitats, including forests and woodlands on black alluvial cracking clays and clay loams dominated by Brigalow, other wattles or buloke; and various blue spotted gum, ironbark, white cypress and buloke open forests and woodlands associations on sandstone derived soils (DCCEEW 2023b). Whilst they can occur in a wide range of habitats, they appear to have a preference for brigalow habitats growing on cracking black clay and clay loams

Little is known about the ecological requirements of this species however, they are known to rely on certain microhabitat features such as fallen timber, ground litter, soil cracks and other cavities and termite mounds. Within the Development footprint, areas of suitable habitat for this species were restricted to patches of regrowth RE 11.5.1 (refer to **Figure 6.6**). Similar areas of suitable habitat were also mapped more broadly for the Dunmall's snake as part of the ecological assessments undertaken for the SGP (Ecosmart 2023).

Although areas of 'habitat critical to the survival of the species' have not been explicitly defined for the Dunmall's snake in the conservation advice or draft referral guidelines, important habitat for listed brigalow reptiles should incorporate any large patches of contiguous, suitable habitat and viable landscape corridors which are necessary for the purpose of breeding, dispersal or maintaining the genetic diversity of the species over successive generations (DCCEEW 2023b). Considering the location of the Project within the broader landscape, and the contiguous nature of the surrounding vegetation, suitable habitat identified within the Development footprint is likely to constitute 'habitat critical to the survival of the species'.

6.2.7.3 Important population

Whilst individual important populations of Dunmall's snake are not defined in the referral guidelines for this species (DCCEEW 2023b), these guidelines advise that important habitat should be used as a surrogate for important populations. As discussed in **Section 6.2.7.2** suitable habitat for this species within the Development footprint likely constitutes 'habitat critical to the survival of the species' which is a surrogate for an important population.



- Highway
- Main Road
- Local Road
- Watercourse
- Project Site
- Development Footprint
- Base Type Parcel
- Dunmall's Snake Breeding and Foraging Habitat

SGP NORTH SOLAR FARM
Suitable Habitat for Dunmall's Snake
Figure 6.6

N

0 m 500

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6.2.7.4 Threats

The main identified threat to Dunmall's snake is a continued legacy of past broadscale land clearing and habitat modification. The preferred habitat for this species has been extensively modified and continues to be threatened by overgrazing by stock, modification for grazing and agriculture, pasture improvement, crop production and urban development. Drainage of swamps may also be a threat to this species. Predation by feral animals has also been identified as a potential threat (DCCEEW 2025b).

6.3 Possible MNES species that are unlikely to be impacted by the Project

Sections 6.3.1 to **6.3.5** outline the population and/or site habitat characteristics that mean that these four possibly present MNES are unlikely to be impacted by the Project.

6.3.1 Painted honeyeater, *Grantiella picta* (Vulnerable)

Sparsely distributed from south-eastern Australia to north-western Queensland and the eastern Northern Territory (DoE 2015b), the painted honeyeater is the most specialised of Australia's honeyeaters. It is nomadic and occurs at low densities throughout its range (DAWE, 2021). Their diet consists of mistletoe fruits but also includes nectar (from flowering mistletoe, eucalypts and possibly banksias) and arthropods, especially in the non-breeding season (DoE, 2015b). This species inhabits eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia dominated woodlands, paperbarks, casuarinas, *Callitris* and trees on farmland gardens (DoE, 2015). They prefer woodlands that contain a higher number of mature trees, as these host more mistletoes.

Painted honeyeater is a seasonal migrant within Australia. Analysis of spatially accurate and recent records undertaken for the broader SGP (which includes the Development footprint) identified that painted honeyeater records are strongly correlated with non-remnant areas and Broad Vegetation Group (BVG) 25a (i.e. brigalow communities) (EcoSmart, 2023), with 97% of records within 50 km associated with these habitat types. Spatial data also shows that many records in non-remnant habitat are associated with patches of brigalow-dominated regrowth presenting a clear picture of habitat preference. If the species does occur in the Development footprint vicinity, it would only be on a sporadic basis and limited to windows of temporary food availability.

Due to the absence of preferred brigalow habitat in the Development footprint and surrounds, the low abundance of mistletoe and sporadic nature of visitation in the area, the Project is unlikely to significantly impact painted honeyeater, and it is not discussed further in this report.

6.3.2 White-throated needletail, *Hirundapus caudacutus* (Vulnerable and migratory)

White-throated needletail is a predominantly aerial species that is known to forage on the wing over large areas of Australia during the southern hemisphere summer. The white-throated needletail breeds in the northern hemisphere. When in Australia, it is primarily aerial, flying from heights under 1 m to greater than 1000 m (TSSC 2019). Based on its aerial habit within Australia, there is no potential for impacts associated with the construction, operation or decommissioning of the Project (as detailed in **Section 7**) to affect this species and it is not discussed further in this report.

6.3.3 Fork-tailed swift, *Apus pacificus* (Migratory)

Like White-throated needletail, fork-tailed swift is a predominantly aerial species that is known to forage on the wing over large areas of Australia during the southern hemisphere summer. It is also non-breeding in Australia. When in Australia, it is primarily aerial, flying from heights under 1 m to greater than 300 m (DoE 2025a). Based on its aerial habit within Australia, there is no potential for the impacts associated with the construction, operation or decommissioning of the Project (as detailed in **Section 7**) to impact this species and it is not discussed further in this report.

6.4 Candidate MNES

Based on the characteristics of the species relative to the nature of the Project and the habitats available in the Development footprint (as detailed in **Section 6.2**), there is potential for the Project to affect:

- Corben's long-eared bat;
- Greater glider;
- Koala;
- South-eastern glossy black-cockatoo;
- Squatter pigeon;
- Diamond firetail, and
- Dunmall's snake.

The potential mechanisms by which the Project may impact these species are described in **Section 7**. The avoidance and mitigation and management measures which will be implemented to minimise the risk and significance of these impacts to these species are detailed in **Section 8**.

Section 9 presents a significant impact assessments for each of these potentially affected species.

The characteristics of the remaining potentially present species relative to the habitats available in the Development footprint (as detailed in **Section 6.2.7.4**) demonstrate that the following species are unlikely to be affected by the Project:

- Painted honeyeater
- White-throated needletail
- Fork-tailed swift.

7. Project Impacts

The following sections of the PD describe and quantify potential Project impacts associated with the construction and operation of the Project. Significant impact assessments for MNES species identified as potentially affected by the Project (as detailed in **Section 6**) are presented in **Section 9**.

7.1 Potential construction impacts

Throughout the construction phase, the Project has the potential to impact MNES species via the following:

- Vegetation clearing resulting in a reduction in available habitat within the vicinity;
- Habitat fragmentation and reduced connectivity;
- Fauna injury or mortality;
- Wildlife disturbance due to dust, noise, light and vibration emissions;
- Reduced water quality due to erosion and sedimentation;
- Potential spills of hazardous materials;
- Introduction or increased prevalence of pests and weeds due to increased vehicle movements and vegetation clearing; and
- Increase in bushfire risk.

These potential impacts are discussed in more detail in the following sections.

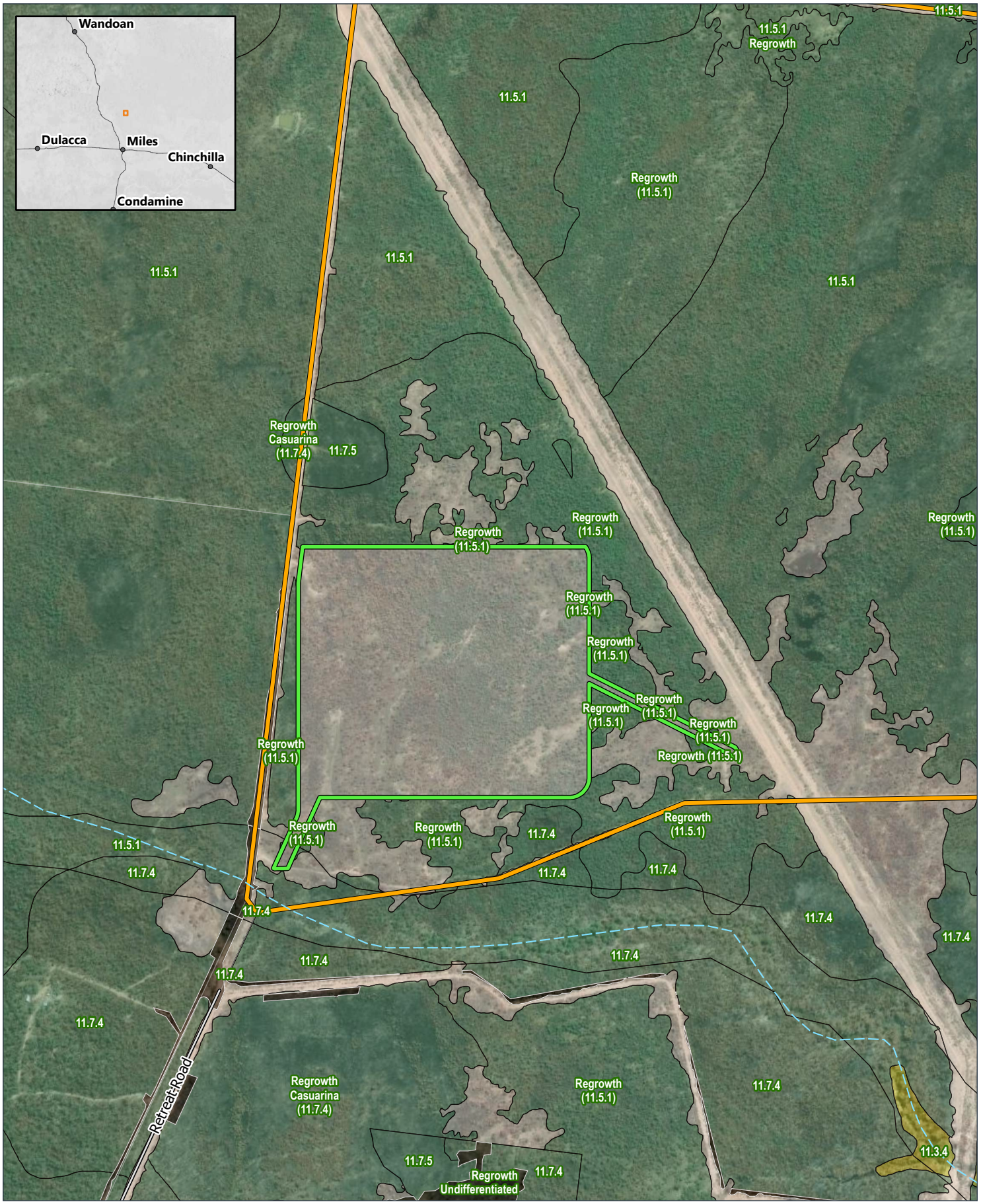
7.1.1 Vegetation clearing and habitat loss

Impacts to native vegetation have been minimised through careful site selection and infrastructure optimisation as detailed in **Section 8.1**. However, establishment of the Project will result in the clearing of native vegetation within the Development footprint (an area 30.1 ha in size). This will result in the removal of regrowth eucalypt woodland and intervening cleared (non-remnant areas) as shown on **Figure 7.1**.

A breakdown of clearing by vegetation community type is provided in **Table 7.1**.

Table 7.1: Summary of proposed vegetation clearing within the Development footprint

RE	Short description	VMA Status	Clearing within the Development footprint (ha)
Regrowth			
Regrowth 11.5.1	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	Least concern	19.8
Non-remnant			
-	Non-remnant	-	10.3
		Total	**30.1**



Native Vegetation Clearing

Figure 7.1

DWG No: ARR-005_025[I]
DATE: 28/01/2026
DRAWN: JT
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N

0 m 250

GDA2020 MGA Zone 56

- Minor - non perennial
- Highway
- Main Road
- Local Road
- Project Site
- Development Footprint
- Base Type Parcel

Ground-Truthed Regional Ecosystem Biodiversity Status:

- Endangered
- Of Concern
- No Concern at Present
- Non-Remnant
- N/A
- Water

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Clearing of native vegetation will result in the removal of habitat and potential habitat for MNES species from within the Development footprint as set out in **Table 7.2**. While potential habitat for greater glider and squatter pigeon is present, the Development footprint does not contain 'habitat critical for survival' for either species (refer to **Section 6.2.2.2**). Significant impact assessments conducted for individual MNES are presented in **Section 8.**

Table 7.2: Impacts on habitat for MNES (shading indicates habitat critical to the survival of the species)

MNES	Habitat type	Habitat within the Development footprint (ha)
Corben's long-eared bat	Roosting and foraging	19.8
	Foraging only	10.3
Greater glider	Foraging	19.8
Koala	Breeding and foraging	19.8
	Dispersal	10.3
Squatter pigeon	Foraging	30.1
South-eastern glossy black-cockatoo	Foraging	19.8
Diamond firetail	Breeding and foraging	30.1
Dunmall's snake	Breeding and foraging	19.8

7.1.2 Habitat fragmentation and reduced connectivity

Habitat fragmentation involves the splitting of natural habitats and ecosystems into smaller and more isolated patches. It reduces the availability and suitability of adjacent areas for wildlife. Fragmentation is a complex process, in which the loss and isolation of natural habitats are the most important factors. It is a process in which once continuous habitat is transformed into a larger number of small patches, of smaller overall area, isolated from each other by a matrix which is usually different (in composition or structure) from the original habitat (Wilcove et. al., 1986).

Fragmentation also isolates forest remnants which were once embedded in continuous forest and are now exposed to the altered physical environment of the adjacent cleared area. The amount of light reaching plants is higher at the edge of a forest fragment than in the forest interior. Consequently, temperature and wind velocity increases and relative humidity decreases at the forest edge. The changes in light, moisture and wind may significantly alter the nature of the plant and animal communities that occur there.

The Development footprint is within an existing mosaic of relatively small and disturbed remnant, regrowth and cleared areas. The surrounding landscape is already relatively fragmented included by linear cleared corridors for existing pipelines, access tracks and fences. Development of the Projects will result in a cleared area approximately 500 m wide by 550 m long which will add to the existing fragmentation of the surrounding vegetation matrix. Taking in remnant vegetation beyond the Development footprint, this will result in creation of patches to the north, east and south with reduced patch size (~4-14 ha in area), greater edge area and reduced connectivity. This would be expected to result in reduced habitat quality in the remaining patches though the area's existing overall vegetative cover will largely be maintained as shown in **Figure 7.1**.

Fauna movement will also be restricted by exclusion fencing around the solar farm however, east-west access will be maintained to the north and south of the Development footprint. North-south fauna movement will be maintained via a corridor of vegetation on the eastern side between the Development footprint and the gas gathering network/gas pipeline easement to the east. This corridor will vary in width, narrowing to approximately 50 m at the northern end of the solar farm. This would be navigable by most faunal groups and will not represent an impermeable

barrier, though movement for small mammals and reptiles may be somewhat restricted. A strip approximately 50 m wide will also be maintained on the western side of the Development footprint, separated from adjoining remnant vegetation to the west by the existing boundary access track. Relatively extensive areas of similar remnant and regrowth areas further to the north, south, east and west of the Development footprint (as shown in **Figure 7.1**) will continue to provide similar overall connectivity across the landscape to that which would exist without the Project.

7.1.3 Fauna injury or mortality

Installation of electrical cables that run from the combiner boxes to power conversion stations and if decided, the 11 kV transmission line in underground trenches is required. Additionally, the installation of steel posts in the ground is required to form the foundation of the solar tracking system. In these instances, the posts are likely to be driven directly into the ground (piled) without the use of concrete. These Project activities will involve removal of ground vegetation, soil and rock which may provide fauna habitat (e.g. denning sites in rocky areas). During trenching activities there is potential for fauna to fall into and become trapped in open trenches. Both activities may lead to an increased risk in predation or direct mortality. Particularly susceptible species groups include reptiles, frogs and small mammals.

The construction of the internal access roads, perimeter fencing (refer to **Section 3.1.8** and **Section 3.2.1.2**), site access gate, and car park may cause injury and/or mortality to ground-welling or slow-moving species. Similarly, increased vehicle movements from the tie-in point to the gate have some limited potential to kill or injure fauna if impact accidents occur. Perimeter roads will be inside the fence line and therefore, not accessible to fauna.

The Project will require vegetation clearing, which has the potential to cause direct fauna injury and/or mortality through vehicle and/or machinery collision, entrapment in trenches, or falling trees. Fauna mortality from tree clearing is a greater risk for nocturnal and/or arboreal mammals that use trees as nesting habitat.

Avoidance, mitigation and management measures to be implemented by the Project to minimise the risk of fauna injury and mortality are detailed in **Section 8.2.1**.

7.1.4 Noise and vibration

Construction noise will be generated from activities such as, machinery use, vehicles, and presence of the workforce. These noises will vary in duration from short, intermittent noises (e.g. vehicles, machinery, and workforce) to more continuous noises from generators. However, these construction noises will only occur during daylight hours (i.e. 6:30 am to 6:30 pm), which will minimise disruption to nocturnal fauna. Noise may adversely affect fauna by interfering with communication (e.g. territorial bird song), masking the sounds of predators and prey, which may cause avoidance reactions and displacement from habitat. Vibration from vehicles, pile drivers for solar panel posts and other construction plant and equipment has the potential to cause temporary disturbance and/or displacement to fauna during the construction phase.

Any impacts of construction noise and vibration to local fauna would be temporary and will be further reduced by implementing the Project controls detailed in **Section 8.2.1.**

7.1.5 Light emissions

Artificial lighting from infrastructure and machinery has the potential to impact fauna within the Development footprint vicinity. Artificial lighting can have a range of impacts which may vary between species. Artificial light can disrupt patterns of both nocturnal and diurnal species. Some species may avoid brightly lit areas, to avoid the potential of increased predation risk. Conversely, some species such as nocturnal reptiles, frogs and bats may congregate at artificial light sources to feed on insects attracted to light. Uncontrolled light emissions have the potential to disrupt breeding and migratory patterns and also disorientate certain fauna species.

However, construction activities for the Project will be conducted predominantly during daylight hours (i.e. 6:30 am and 6:30 pm) and therefore, light emissions, spill and glare, are not expected to have any significant impact on fauna during the construction period.

The impacts of light emissions to local fauna will be further reduced by implementing the Project controls detailed in **Section 8.2.1.8** .

7.1.6 Erosion and sedimentation

The main construction activities that may lead to erosion and sedimentation within the Development footprint include:

- Any Project activities that require vegetation clearing;
- Installation of steel posts; and
- Creation of access tracks.

During these activities, sediment can move and during rainfall events be transported by surface water. These sediments have the potential to be discharged into watercourses and drainage lines, which may reduce water quality in downstream aquatic habitats. Any increased suspended sediments can reduce light penetration into the water column, which reduces aquatic macrophytes photosynthesis and decreased dissolved oxygen levels.

All nearby waterways are ephemeral and typically only carry water following rainfall, which would limit the magnitude and frequency of any such potential impacts. Nonetheless, mitigation measures to further reduce any potential for impacts associated with erosion and sedimentation are detailed in **Section 8.2.1.7** .

7.1.7 Hazardous materials

Project activities that may require the use of hazardous materials include:

- Power conversion station installation;
- Electrical cabling and inverters;
- Use of construction materials and machinery;
- Temporary construction compounds and laydown areas; and
- Pile driving and civil works.

These activities may require the use of substances such as transformer oil, electrical insulation materials, fluids, fuels, lubricants and hydraulic fluids. These materials have the potential to cause soil or water contamination from leaks or spills and also pose as a fire hazard. These potential impacts could injure and/or increase mortality risk for fauna and flora; however, the severity would be dependent on the location and magnitude of the uncontrolled release.

Mitigation measures to reduce the potential for impacts associated with hazardous materials are detailed in **Section 8.2.1.8** .

7.1.8 Pests and weeds

In the absence of appropriate mitigation measures, the following Project activities have the potential to increase the abundance of pest flora and fauna in the Development footprint and surrounds:

- Movement of vehicles;
- Movement of equipment and personnel throughout the Development footprint;
- Vegetation clearing;
- Soil stripping and stockpiling;
- Uncontained waste sources;
- Development of the construction and laydown areas; and
- Access and internal road construction.

Many weed species thrive on disturbed ground and have the potential to rapidly colonise disturbed areas in advance of native species recolonisation. Increased pest flora abundance can have adverse impacts on native vegetation and biodiversity, as well as potential negative economic effects on local land uses such as grazing activities. However, the Development footprint currently contains only two weed species (*Melinis repens* and *Opuntia* sp.) despite a long history of cattle access, agricultural use, and the adjoining linear infrastructure corridors.

While project activities have the potential to increase the abundance of pest flora and facilitate dispersal of these species to previously unaffected areas, the restricted vehicle access throughout the site and surrounding area will reduce the likelihood of this occurring. Arrow Energy's Biosecurity procedures will be used for the construction of the Project and as such, it is considered that the risk of introducing new weeds and spreading the existing weeds is relatively low.

The introduction of pest fauna can lead to increased competition with, and predation of native fauna. In addition, the presence of pest species may cause habitat degradation through behaviours such as, vegetation trampling from feral pig wallowing. Uncontained waste sources may also attract feral fauna.

Existing conditions of the site suggest that the number of pest fauna species is limited, with cane toads, feral cats, and the European hare recorded during surveys. The development and implementation of the Project waste management plan will reduce the likelihood of increasing the prevalence of these species. Further details on the Project controls and mitigation measures to reduce potential impacts are detailed in **Section 8.2.1.4** .

7.1.9 Bushfire risk

Fire is a natural part of the Australian landscape, and most vegetation communities are adapted to periodic fires. However, changes in the natural fire regime may result in changes in the species composition and/or structure of the vegetation. The increased presence of construction vehicles and personnel in the Development footprint has the potential to increase fire risk through use of machinery that may generate sparks, use of flammable liquids and idling vehicles being present in areas of ground vegetation.

A 28 m wide APZ has been incorporated into the Development footprint for the Project. While primarily intended to prevent bushfire damage to solar farm infrastructure, the APZ will be established through the initial vegetation clearing and site establishment works and will remain in place for the duration of the construction phase. Construction activities will be managed to ensure any potential ignition sources from 'hot' work (e.g. welding) are conducted within the cleared APZ to minimise the potential for fires to spread into adjoining vegetation.

Further details on the Project controls and mitigation measures to reduce potential impacts associate with bushfire risk are detailed in **Section 8.2.1.5** .

7.2 Potential operational impacts

In the absence of appropriate mitigation measures, the operational phase of, the Project has the potential to impact on MNES species via the following:

- Fauna injury or mortality due to vehicle strike;
- Barrier effects associated with exclusion fencing;
- Entrapment in exclusion fencing and/or within the solar farm;
- Noise and light emissions;
- Potential spills of hazardous materials
- Increased pests and weeds;
- Increased risk of bushfire; and
- Heat island effect.

These potential impacts are discussed in more detail in the following sections.

7.2.1 Vehicle strikes

Section 3.3.1 details the operational phase of the Project and with reference to this Project, vehicles will only move between the tie-in point and the gate. These vehicles movements will be less than experienced during the construction phase, with a workforce of only approximately four FTE (**Section 3.3.2**). In addition, fauna will be excluded from the solar farm by fencing and therefore occurrence of vehicle strikes to fauna is limited to the perimeter roads. As such, fauna vehicular strikes are unlikely.

Nonetheless, mitigation measures to further reduce these risks are detailed in **Section 8.2.2.3 .**

7.2.2 Barrier effects and fauna entrapment

Exclusion fencing may cause 'barrier effects' that have the potential to alter the movement patterns of fauna between areas of habitat adjacent to the Development footprint. This can disrupt natural processes (e.g. foraging, migration, or access to shelter or water) and potentially contribute to habitat fragmentation and reduced ecological connectivity as described in **Section 7.1.2**. The perimeter fence around the solar farm infrastructure will restrict the movement of small to medium-sized mammals and reptiles for the life of the Project potentially impacting species such as the black-striped wallaby (*Notamacropus dorsalis*), feathertail glider (*Acrobates pygmaeus*), and various skinks and geckoes (e.g., *Ctenotus taeniolatus, Diplodactylus vittatus*) which rely on unobstructed ground-level corridors to access food, shelter, and mates. This will be mitigated to some extent by the retention of native vegetation outside the Development footprint which will facilitate movement as described in **Section 8.2.2.1** .

Barbed wire fences can cause injuries to animals attempting to climb or cross the fence. Nocturnal animals can be particularly vulnerable as they may not see the fence and become trapped or injured when attempting to cross. The perimeter fencing around the solar farm will be designed to minimise potential hazards to arboreal mammals such as koala and greater glider and nocturnal species such as bats by avoiding use of barbed-wire and incorporating Queensland Government endorsed fauna exclusion floppy top fencing design measures (i.e. designed with consideration of best-practice guidelines including DTMR 2025).

Entrapment within the solar farm may also occur where animals do manage to cross the fence and are unable to negotiate their way through the solar farm. Project controls to minimise opportunities for barrier effects and fauna entrapment and management strategies in the event that fauna do become trapped in the Project area (including the use of outward facing floppy top fencing) are set out in **Section 8.2.2.1** .

7.2.3 Noise and light emissions

The operational impacts from noise and light emissions are similar to those described in **Section 7.1.4** and **7.1.5** however, the potential for noise generating activities is greatly reduced. Project activities that may cause operational noise include intermittent maintenance activities and low-level mechanical noise from tracking systems and inverters. These activities are relatively infrequent and/or quiet and unlikely to cause disturbances to fauna or nearby receptors. Mitigation measures to reduce the potential for impacts associated with noise emissions during the operational phase of the Project are detailed in **Section 8.2.2.6** .

Artificial lighting from infrastructure (e.g. site access points and perimeter security lighting) has the potential to impact fauna in the following ways: Certain light emission levels could potentially disrupt behavioural and physiological patterns in both nocturnal and diurnal species. For nocturnal species, artificial lighting has the potential to interfere with foraging, navigation, and predator avoidance behaviours. Diurnal species may potentially experience altered activity cycles due to extended light exposure, potentially affecting feeding and breeding patterns. In certain situations, some species could actively avoid brightly lit areas due to perceived increased predation risk, resulting in habitat displacement. Artificial lighting may also attract insects, which in turn can increase the presence of insectivorous species such as bats and birds. The risk of these impacts is low subject to appropriate lighting design as detailed in **Section 8.2.2.6** .

7.2.4 Hazardous materials

In the absence of appropriate controls, the use and/or presence of hazardous materials during the operation of the Project would have the potential to impact local fauna, waterways, and soil. It is important to note that the volume of such substances being used and stored on site will be less than during construction, with a corresponding reduction in risk.

Although solar panels are designed with encapsulants that prevent chemical leaching, damage from extreme weather events or improper decommissioning processes would have the potential to result in the release of toxic substances (e.g. industrial silicon-based products and associated metals) into the surrounding environment over time if not detected and managed.

Perfluorooctanoic acid (PFOA) and perflurooctane sulfonate (PFOS) are man-made chemicals that have been used in various industrial applications. Both are part of a larger group of chemicals known as per-and polyfluoroalkyl substances (PFAS) which have reportedly been used in some solar modules (Nain and Anctil, 2025). Arrow CSG and the contractor engaged to construct, operate and decommission the solar farm have committed to procuring PFOS-free solar panels, therefore eliminating any risk of PFOS leaching to local waterways.

The contract agreement also requests that no asbestos, lead based paints, PFOA and related substances, perfluorooctanesulfonic acid (PHOS) and related substances, perfluorhexanesulfonic acid (PFHxS) and related substances, polychlorinated biphenyls (PCBs), chloroflurocarbon (CFC) products and other ozone depleting substances (ODSs), including halon fire extinguishers, freon refrigerants and chlorinated solvents, be brought onto or used at the solar farm facility.

Hazardous materials that remain on site during the operational phase will be primarily for maintenance activities, electrical infrastructure, and water storage systems. These may include fuels, lubricants, hydraulic fluids, cleaning agents, and water treatment chemicals. If not managed properly, impacts from accidental spills or leaks could result in soil contamination, degradation of water quality, and harm to native flora and fauna.

Mitigation measures to reduce the risk of potential impacts from hazardous materials are detailed in **Section 8.2.2.6** .

7.2.5 Pests and weeds

As described in **Section 7.1.8**, operational activities may continue to facilitate the spread and establishment of pest flora and fauna within the Project area and surrounding environment. As the Project site already contains very few weeds and the level of disturbance during Project operation is reduced, it is unlikely that the Project will contribute to the introduction of new weeds. Arrow Energy's Biosecurity procedures will be used for Project operation.

Pest fauna including wild dogs, pigs, foxes, and rodents can impact native fauna through predation, competition, and habitat degradation. Infrastructure such as solar arrays, fencing, and water storage tanks may provide shelter or attract these pest species. However, it is unlikely that this will occur due to the exclusion fencing used around the Project. These species Further details on the Project controls implemented to reduce the impacts associated with pests are weeds are discussed in **Section 8.2.2.5** .

7.2.6 Bushfire risk

During operation, bushfire risk remains present due to the periodic use of maintenance vehicles and equipment within the Project area. Activities such as vegetation management, panel cleaning, and equipment servicing may involve machinery capable of generating sparks or heat. The presence of flammable liquids and idling vehicles in proximity to dry ground cover also presents a potential ignition source. Although the APZ will be maintained as a cleared and grassed buffer, strict adherence to fire safety protocols, including equipment checks, restricted activities during high fire danger periods, and compliance with bushfire mitigation measures, will be implemented to minimise risk. Further details on the Project controls which will be implemented to reduce the impacts associated with bushfire risk are discussed in **Section 8.2.2.2** .

7.2.7 Heat island effect

PV heat island effect refers to the warming of areas surrounding solar farms and potentially disrupting wildlife habitats, ecosystem function, human health, and some instances home values in residential areas (Barron-Gafford, 2016).

This area of research remains in its infancy but research to date suggest the effects of heat islands are site and project specific. Research suggests that PV panels convert incident solar radiation into heat, and this can alter the airflow and temperature profiles between panels and surrounds. However, these alterations in airflow and temperature and possible impacts to humans, other species, and flora have been questioned (Vasilis Fthenakis, 2013).

Some research suggests that PV systems result in cooling effects on the local environment however, this is dependent on the efficiency and placement of the PV panels (Guoqing et al, 2021). Others suggest a warming effect (Barron-Gafford, 2016). Fthenakis and Yu (2013) provided evidence for the warming effect however, demonstrated that temperatures rapidly decrease beyond the perimeter of the solar plant. Other research identified that the heat island

effect was indistinguishable from air temperatures over native vegetation when measured at a distance of 30 m from the edge of the PV array (Barron-Gafford, 2016). Research suggests solar farms may slightly alter microclimate conditions within the site, potentially helping retain ground cover in extreme temperatures (Vasilis Fthenakis, 2013). Impacts on nearby land, including flora and fauna, agriculture and livestock, are expected to be negligible.

While adjacent land uses are not considered sensitive, the Project will incorporate a 28 m APZ around the facility footprint, consistent with bushfire hazard mitigation requirements. This APZ will be maintained in a low fuel condition and provides separation from surrounding vegetation, reducing radiant heat exposure and ignition risk.

The potential impacts of heat island effects remain uncertain; however, the solar panel areas will be cleared and maintained as mown grass, with vegetation under panels managed to a height not exceeding 100 mm. This treatment is expected to minimise any heat-related impacts to fauna and flora. The APZ is located within the Project area but outside the solar infrastructure footprint, ensuring compliance with bushfire resilience standards while supporting ecological outcomes.

7.3 Potential decommissioning impacts

Once the Project ceases, infrastructure will be decommissioned and the site rehabilitated to facilitate continuation of the current land use (i.e. grazing). Decommissioning involves the removal of all above-ground infrastructure such as solar panels, mounting structures and racking systems, inverters and transformers, fencing, etc. Removal of buried infrastructure is not normally undertaken as this typically causes additional disturbance and environmental impacts. Once above-ground infrastructure is removed, the land is rehabilitated in line with specific approval conditions and landholder agreements.

In the absence of appropriate mitigation measures, potential impacts during decommissioning are likely to relate to the following:

- Direct fauna mortality;
- Pests and weeds;
- Air quality and dust;
- Noise and vibration;
- Hydrological changes; and
- Bushfire risk.

7.3.1 Direct fauna mortality

During decommissioning, there is potential for direct fauna mortality resulting from the removal of infrastructure and reinstatement of land. Activities such as dismantling solar arrays, extracting piers, and operating heavy machinery has the potential to inadvertently harm fauna sheltering within or near infrastructure. In particular, reptiles, small mammals, and ground-nesting birds have the potential to be impacted.

The presence of personnel and equipment may also disturb adjoining habitats, increasing the risk of injury or displacement. To minimise these impacts, pre-clearance fauna surveys, staged removal of infrastructure, and timing works outside sensitive breeding periods will be incorporated into the decommissioning plan.

7.3.2 Pests and weeds

Decommissioning activities have the potential to temporarily increase pest activity and the abundance of weed species within the Project area. The removal of infrastructure, disturbance of soil, and reduction in human presence can create conditions favourable for invasive fauna such as wild dogs, pigs, and rodents. These species may exploit exposed areas for shelter or foraging, potentially impacting recolonising native fauna and surrounding land uses.

To manage this risk, pest and weed monitoring and control measures will be maintained throughout the decommissioning phase, including secure waste handling, vegetation management, and coordination with regional pest control programs.

7.3.3 Air quality and dust

Decommissioning activities such as dismantling infrastructure, removing solar panels and posts, and site rehabilitation will generate dust and minor air emissions. These impacts are expected to be short-term and localised. Dust may be generated from:

- Vehicle movement on unsealed roads.
- Earthworks during removal of footings and underground cables.
- Stockpiling and handling of materials.

Air emissions will be mostly limited to those from diesel-powered machinery and vehicles. Given the scale of the site and the nature of activities, emissions are expected to be low and below relevant thresholds. Mitigation measures such as water suppression, speed limits on site, and progressive rehabilitation will be implemented to minimise dust generation and maintain air quality. It is unlikely any long-term or regional air quality impacts will arise from the decommissioning of the Project.

7.3.4 Noise and vibration

Noise and vibration during decommissioning will result from machinery use, vehicle movements, and dismantling activities. These impacts will be temporary and limited to daytime hours. Possible sources of noise and vibration during the decommissioning process include:

- Excavators and trucks removing infrastructure.
- Pile extraction or cutting (if applicable).
- General site traffic.

Noise levels are expected to be similar to those experienced during construction but over a shorter duration. Vibration impacts are expected to be negligible, with no use of heavy vibratory equipment anticipated.

The site's remote location and distance from sensitive receptors will minimise off-site impacts. Standard mitigation measures such as equipment maintenance, restricted work hours, and noise monitoring (if required) will be implemented. It is unlikely that the Project will cause long-term or residual noise or vibration impacts.

7.3.5 Hydrological changes

Decommissioning is not expected to result in notable hydrological changes. The Project area does not contain any mapped watercourses or wetlands, and nearby watercourses are ephemeral, only flowing after rainfall.

It is possible that minor changes to surface runoff patterns due to the removal of infrastructure and the temporary disturbance of soil during rehabilitation may affect infiltration and runoff rates. However, if these impacts were to occur, they would be localised and short-term. The decommissioning plan will include land rehabilitation, which may include activities such as stabilising soils and re-establishing vegetation cover. This will also assist in restoring pre-existing drainage conditions.

It is unlikely that there will be impacts to downstream watercourses, aquifers, or groundwater-dependent ecosystems due to the site's distance from sensitive receptors and the absence of permanent water features within the Project area.

7.3.6 Bushfire risk

Decommissioning works may temporarily increase bushfire risk due to the use of machinery, vehicle movements, and potential ignition sources. These activities will occur within previously cleared areas, including the maintained APZ, which reduces the likelihood of fire spread. Key activities that may increase bushfire risk during decommissioning include:

- Machinery and tools may generate sparks or heat.
- Vegetation regrowth in non-operational areas may increase fuel load.
- Weather conditions (e.g. dry, windy days) may elevate risk.

Bushfire risk will be managed by conducting works within the APZ and cleared areas, implementing fire prevention protocols (e.g. no hot works during high fire danger periods), maintaining firefighting equipment on-site, and preferentially scheduling works outside peak fire season. With these Project controls in place, bushfire risk during decommissioning is considered low.

7.4 Climate change

Overall, the Project will have a negligible negative impact on climate change, and it is unlikely that this Project will be adversely affected by climate change. The generation of use of solar powered electricity onsite is a positive contribution towards reducing the global effects of climate change.

Throughout the Project lifecycle, minor and short-term greenhouse gas (GHG) emissions may result from fuel use in machinery, vehicles, and material transport. These emissions are expected to be low, particularly when considered against regional and national GHG profiles.

Climate-related risks, such as extreme weather events, may influence the timing or methods used during construction, operation, or decommissioning. However, these risks are not anticipated to materially affect project outcomes.

The HPF represents a low-emissions development option, with forecasted emissions intensity:

- 41% lower than the current Queensland electricity grid average, and
- 23% lower than the prescribed emissions intensity under the Safeguard Mechanism.

By generating up to 17 MWp of solar power, the Project will significantly reduce Arrow Energy's reliance on fossil fuels, shifting the primary energy source to solar.

Overall, the Project is expected to have a negligible negative impact on climate change. Onsite solar electricity generation contributes positively to global efforts to reduce GHG emissions and supports a transition to cleaner energy.

7.5 Facilitated impacts

Facilitated impacts refer to impacts which result from further actions (including actions by third parties) which are made possible or facilitated by the action. The Project is a 'related action' to the development of the HPF and FCS as:

- electricity generated by the solar farm will be supplied to the HPF; and
- the HPF is being developed specifically to power the FCS (as the end user of the electricity generated by the solar farm) for the purpose of gas compression to supply domestic and export markets.

While the impacts associated with the HPF and FCS are related, they are not 'further actions' made possible solely by the development of the proposed solar farm. Impacts associated with these facilities have already been assessed under the existing EPBC approval for the SGP (EPBC 2010/5344) and could proceed without the approval of the solar farm Project.

Development of the Project does require the construction of 11 kV transmission line connection that would not be required in the absence of the Project. However, impacts associated with the transmission line corridor beyond the Project area boundary have already been assessed as part of the existing SGP EPBC approvals as described in **Section 3.1.10** of this PD. Similarly, the main site access from Retreat Road and internal access road network being developed to enable access to production facilities elsewhere on Girrahween Station (refer **Section 3.1.7**) and are not 'facilitated' by the development of the Project.

7.6 Cumulative impacts

Cumulative impacts refer to impacts where potential Project-related impacts on MNES are in addition to existing impacts of other activities in the region and vicinity. A summary of nearby Projects with the potential to result in cumulative impacts with, or as a result of the Project is provided in **Table 7.3**. Potential cumulative impacts on relevant

MNES arising from these projects (as documented in published approval documentation) are summarised in Table 7.4.

Table 7.3: Nearby projects with potential cumulative impacts

Project	Approx. distance (km)	Status	Detail
SGP North Project	Co-located	Approved (under development)	Development of 214 gas wells and associated infrastructure. Impacts approved under EA0001399 and EPBC 2010/5344. Impacts on relevant MNES are discussed in **Table 7.4**.
Columboola Battery	18 km	Proposed	Development of two battery energy storage systems (BESS). Subject to assessment under the EPBC Act by Preliminary Documentation (EPBC 2025/10241). Impacts on relevant MNES are discussed in the **Table 7.4**.
Warhook Solar Farm	13 km	Proposed	Development of a 200 MW solar farm. Referred under the EPBC Act, determined to be not a controlled action. No impact on MNES relevant to the SGP North Solar Farm Project documented in the EPBC Referral (EPBC 2019/8456).

Table 7.4: Potential cumulative impacts to impacted MNES

Species	EPBC Act Status	Potential cumulative impacts
Corben's long-eared bat	Vulnerable	The Project requires the clearing of 30.1 ha combined of potential roosting and/or foraging habitat for Corben's long-eared bat. Cumulative impacts on this species may arise as a result of: • an overall reduction in the area of available habitat in the vicinity of the Development footprint; • clearing occurring over multiple small areas resulting in fragmentation of contiguous areas of habitat and affecting habitat quality as described in **Section 7.1.2**; and • increased incidence of bushfire resulting in direct mortality and rapid reduction and change in their habitat. The following direct impacts on habitat for the Corben's long-eared bat have been identified in the vicinity of the Project: • 468.8 ha in (undifferentiated) habitat for the SGP North Project; and • 26.7 ha in breeding and foraging habitat for the Columboola BESS. While the combined impacts of these projects would result in a reduction of habitat in the vicinity of the Project, there are extensive areas of similar habitat in the local area and in the region that will be retained. Smaller areas of clearing in contiguous areas of habitat also have the potential to result in fragmentation and reduced habitat quality as described in **Section 7.1.2.**

Species	EPBC Act Status	Potential cumulative impacts
		Subject to implementation of appropriate management controls, no cumulative impacts related to bushfire would be expected.
Greater glider	Endangered	The Project requires the clearing of the 19.8 ha of potential foraging habitat for the greater glider. Cumulative impacts on greater glider may arise as a result of: • an overall reduction in the area of available habitat in the vicinity of the Development footprint; • clearing occurring over multiple small areas resulting in fragmentation of contiguous areas of habitat and affecting habitat quality as described in **Section 7.1.2**; • increased risk of entanglement resulting from the introduction of exclusion fencing around individual facilities; and • direct mortality and habitat loss resulting from high severity bushfire. The following direct impacts on habitat for the greater glider have been identified in the vicinity of the Project • 473 ha in (undifferentiated) habitat for the SGP North Project; and • 27.2 ha in breeding and foraging habitat for the Columboola BESS. While the combined impacts of these projects would result in a reduction of habitat in the vicinity of the Project, there are extensive areas of similar habitat in the local area and in the region that will be retained. Smaller areas of clearing in contiguous areas of habitat also have the potential to result in fragmentation and reduced habitat quality as described in **Section 7.1.2.** Subject to implementation of appropriate management controls, no cumulative impacts related to bushfire would be expected.
Koala	Endangered	The Project requires the clearing of the 19.8 ha of potential breeding and foraging habitat and 10.3 ha of dispersal habitat for the koala. Cumulative impacts on the koala may arise as a result of: • an overall reduction in the area of available habitat in the vicinity of the Development footprint; • clearing occurring over multiple small areas resulting in fragmentation of contiguous areas of habitat and affecting habitat quality as described in **Section 7.1.2**; and • increased vulnerability to vehicle strike associated with increased traffic movement in the area. The following direct impacts on habitat for the koala have been identified in the vicinity of the Project • 561 ha in (undifferentiated) habitat for the SGP North Project; and • 27.2 ha in breeding and foraging habitat for the Columboola BESS. While the combined impacts of these projects would result in a reduction of habitat in the vicinity of the Project, there are extensive areas of similar habitat in the local area and in the region that will be retained. Smaller areas of clearing in contiguous areas of habitat also have the potential to result in fragmentation and reduced habitat quality as described in **Section 7.1.2.**

Species	EPBC Act Status	Potential cumulative impacts
		For both the SGP North Solar Farm and the SGP North Project, all vehicles will be restricted to a maximum speed of 40 km/hour and compliance with speed limits monitored using IVMS. As such, the risk of collision with this species is low. Interactions with traffic movements for the Columboola Battery are unlikely given the distance between the two projects.
South-eastern glossy black-cockatoo	Vulnerable	The Project requires the clearing of the 19.8 ha of potential foraging habitat for the south-eastern glossy black-cockatoo. As such, cumulative impacts on the south-eastern glossy-black cockatoo may arise as a result of a reduction in the area of available foraging resources in the vicinity of the Development footprint. The EA application for the SGP North Project identifies impacts on 7.9 ha of foraging habitat for the south-eastern glossy black-cockatoo. Given the extent of retained foraging resources in the vicinity of the Development footprint, significant cumulative impacts on the south-eastern glossy-black cockatoo are unlikely.
Squatter pigeon	Vulnerable	The Project requires the clearing of 30.1 ha of potential foraging habitat for squatter pigeon. No significant residual impacts on habitat for squatter pigeon are documented for SGP North, the Columboola BESS or Warhook Solar Farm. Given the widespread extent of retained foraging resources in the vicinity of the Development footprint, significant cumulative impacts on the squatter pigeon are unlikely.
Diamond firetail	Vulnerable	The Project requires the clearing of 30.1 ha suitable breeding and foraging habitat for diamond firetail. The EA application for the SGP North Project identifies impacts on 463.7 ha of potential habitat for diamond firetail. The Project itself represents a small (~9%) increase to the clearing already approved in the vicinity. While the combined impacts of these projects would result in a reduction of habitat in the vicinity of the Project, there are extensive areas of similar habitat in the local area and in the region that will be retained.
Dunmall's snake	Vulnerable	The Project requires the clearing of 19.8 ha of habitat for Dunmall's snake that is not 'known important habitat' for this species. None of the other Project reported impacts on habitat for this species. Given the broad habitat preferences of this species and the extent of habitat in the vicinity of the Development footprint, significant cumulative impacts on the on this species are unlikely.

Subject to appropriate controls as set out in **Section 8** of this PD, cumulative impacts associated with the Project are not expected to significantly alter the net cumulative impacts of existing and known future development in the area surrounding the Project. Residual significant impacts associated with the SGP North development as assessed by EPBC 2010/5344, including the FCS and HPF, have been offset in accordance with the EPBC Act Offsets Policy.

8. Avoidance, mitigation and management measures

Arrow Energy's Health, Safety and Environment (HSE) Policy (refer to **Appendix I**) governs the development and implementation of Arrow Energy's Environmental Management System (EMS), and, along with the Access and Approvals Framework (ORG-ARW-WLS-PRO-00001) and the Project Environmental Management Plans (EMPs), are the key tools used by Arrow Energy to carry out their activities in an environmentally acceptable manner.

Planning and management of surface activities and ground disturbance is undertaken utilising the 'mitigation hierarchy', a set of hierarchical management principles to avoid, minimise and mitigate impacts to environmental values. These principles are:

- Avoid: Arrow Energy's first preference is to avoid threatened ecological communities, threatened species, threatened species habitat and other ecological values.
- Minimise: where other competing constraints or the scale / location of threatened ecological communities, species habitat or other ecological values dictate that avoidance is not possible (e.g. where there is riparian vegetation that needs to be crossed or large areas of suitable habitat for wide ranging species such as the Koala or Greater Glider), Arrow Energy will preferentially locate infrastructure in a manner that minimises the impact to these values (e.g. cross the riparian vegetation at the narrowest or most degraded part or where practicable on the edge of suitable habitat for listed species so as not to bisect good quality habitat).
- Mitigate: implement mitigation measures to further minimise the direct and indirect impacts on ecological values.
- Remediate and rehabilitate: actively remediate and rehabilitate impacted areas to promote and maintain long term recovery.
- Offset: Arrow Energy will offset unavoidable significant residual impact to MNES and State Matters of Environmental Significance.

Arrow Energy's construction activities avoid and minimise potential impacts on flora and fauna to as low as reasonably practicable. Identified habitat features must be managed according to the Project EMPs and the regulatory conditions of approval.

8.1 Avoidance

Girrahween Station was purchased by Arrow Energy in 2012 and is being developed under approvals for the broader SGP Project to accommodate the Girrahween FCS, the HPF and other infrastructure including a temporary accommodation camp, warehouse and storage and other facilities. The preferred location for the solar farm has been selected on the basis that it is:

- is located in relatively close proximity to the FCS which limits the length, cost and environmental impact of the underground transmission connection to the main HPF.
- co-locates the solar farm site access with approved clearing for gas gathering and access roads for the FCS; and
- avoids areas of remnant eucalypt woodland to the north of the Development footprint.

The Development footprint was selected as it is entirely mapped as Category X (non-remnant) on the RVMM. The area contains predominantly regrowth vegetation that has been subject to historical clearing and disturbance, and as such, the vegetation and fauna habitat quality is lower than that of the surrounding remnant areas. The proposed Development footprint is also separated from the adjoining remnant areas by the approximately 70 m-wide gas pipeline easement to the east and cleared tracks and fence lines to the west. The width of this separation to the east will increase to approximately 100 m once the approved gas gathering network has been constructed.

To avoid and minimise fauna habitat loss, the Project has been designed with the least amount of clearing as practicable.

Arrow Energy have developed an Ecological Impact Assessment Procedure (ORG-ARW-HSM-PRO-00070) which illustrates the processes used to assess ecological values of the Study area to:

- Identify the ecological and biodiversity characteristics of site.
- Identify ecological constraints and opportunities.
- Facilitate avoidance of sensitive ecological features such as threatened species (flora and fauna), fauna habitats and communities on the site and in the surrounding area, and areas of high biodiversity value.
- Where avoidance is not possible, to minimise disturbance of, or develop mitigation or management measures for sensitive ecological features.

To minimise impacts to fauna, selection of the site has followed the hierarchy in Appendix 1 (Preferred Vegetation State for Locating Development Sites) of Arrow Energy's Fauna Management Guideline (ORG-ARW-HSM-GUI-00103). In particular for this Project, Arrow CSG has endeavoured to avoid:

- Significant disturbance to sensitive ecological values (e.g. protected flora, fauna and their habitats, vegetation communities, and watercourses and wetlands) to the extent possible.
- Significant disturbance to land by maximising the use of previously disturbed land.
- Fragmenting fauna habitat at the site. In particular, the Project has been sited away from any large patches of remnant to limit fragmenting fauna habitat and so that it does not isolate any blocks of vegetation.

In accordance with the Ecological Impact Assessment Procedure, the Study area was larger than the required Development footprint to provide options for avoidance. Ultimately, the highest ecological value areas were found to be associated with the watercourse to the south of the Study area and remnant areas to the north. These highest ecological value areas have now been avoided (refer to **Figure 7.1**).

During construction of the project Arrow CSG will also avoid disturbance to land and fauna habitat outside the approved battery limits (i.e. the Development footprint). Specific measures that will be implemented include:

- No go areas will be demarcated on-ground (i.e. high visibility flagging tape, hazard netting or similar) prior to commencement of clearing and soil stripping to prevent over-clearing.
- 'As-disturbed' survey data will be collected and provided by construction contractors permitting tracking of MNES disturbances.
- Demarcation of buffers and informing workers and machinery operators of buffer locations when working within the vicinity of MNES and state-listed species and areas identified for avoidance.
- Construction activities will be limited to work site boundaries.
- Informing relevant workers, including contract plant and machinery operators of the location of significant remnant vegetation and fauna habitat area and buffers and use qualified personnel to guide clearing activities.
- Trees will be felled away from existing vegetation not identified for removal where practicable.
- Damage to trees (e.g. through scraping of tree trunk or breaking of limbs by equipment) not identified for removal will be avoided where practicable.
- Avoiding damaging standing trees not identified for removal. Limiting the scraping of standing tree trunks and breaking of limbs by equipment as far as practicable.
- Prohibiting unauthorised collection of flora and forest products.
- Audits/checks will be undertaken during and after clearing activities to ensure no unauthorised encroachment has occurred. These checks will be carried out at least daily by the site environmental representative in the lead up to, during and at the completion of site clearing activities.

The purpose of these avoidance measures is to ensure that unnecessary MNES fauna habitat removal is avoided. The above measures are widely recognised as industry best-practice and are predicted to be effective in achieving the intended environmental outcome of avoiding unnecessary habitat removal.

As detailed in **Section 8.2.1**, avoidance of impacts to MNES fauna will also be achieved prior to and during construction through MNES fauna specific searches during pre-clearance and FSC surveys and the unexpected find measures such as:

- Stop work orders and work exclusion zones;
- Allowing MNES fauna to relocate of their own volition (include where applicable overnight);
- Delaying clearing within 50 m of any unexpected MNES species nest / maternity roost site finds until young have fledged. Where this is impractical, eggs/young will be removed and a suitably qualified and licensed wildlife carer/facility will be engaged to incubate eggs and raise young animals. Eggs or young will not be destroyed unless as a last resort and then only under an approved damage mitigation permit;
- Species-specific significant impact assessments;
- Species-specific impact management plans;
- Micro-habitat salvage and relocation by a suitably qualified ecologist who holds an appropriate Damage Mitigation Permit;
- Identified maternity roost and nest avoidance and management procedures; and
- Arranging veterinary centre, wildlife hospital, or wildlife expert care if any injured MNES fauna is found.

The mitigation measures specified in **Sections 8.2.1.1** and **8.2.1.2** will facilitate the escape of any MNES fauna present and minimise the risk of fauna injury and mortality. The performance and completion criteria that will be used to monitor the effectiveness of these avoidance measures will include:

- Clearing area boundaries clearly demarcated prior to the commencement of, and throughout vegetation clearing and ground disturbance activities (as recorded in site inspection reports from at least daily inspections by the site environmental representative in the lead up to and during site clearing activities).
- Limited damage to trees, vegetation and fauna habitat within retained areas.
- No unauthorised encroachment into retained vegetation and fauna habitat areas has occurred.
- No MNES fauna harmed, injured or killed.

The effectiveness of these measures will be recorded in site inspection reports from the daily inspections by the site environmental representative in the lead up to and during site clearing activities.

8.2 Mitigation measures

Despite avoiding MNES values to the greatest possible extent, construction of the Project will require unavoidable clearing of some MNES species habitat and the placement and operation of project infrastructure within a larger area of MNES species habitat. The Project will be constructed and operated under the Arrow Energy Health, Safety and Environmental Management System. Under this system, the Project will implement at a minimum the mitigation and management measures as specified within this subsection.

A site-specific Construction Environmental Management Plan (CEMP) will also be developed in cooperation with the construction contractor (third-party operator) once awarded, including the development of a Project-specific Stormwater Management Plan (SMP)) which includes erosion and sediment control measures, and a Waste Management Plan (WMP) which includes management of hazardous substances. Weeds and pest management will be included within the CEMP. The CEMP will also include an emergency response plan (ERP) outlining measures to respond to spills and leakages to ensure that environmental values and human safety are not compromised.

Similarly, a site-specific Operation Environmental Management Plan (OEMP) will be developed in cooperation with the solar farm third-party operator once awarded, including the development of a Project-specific SMP and a WPMP.

Finally, closer to the time of decommissioning, a site-specific Decommissioning Environmental Management Plan (DEMP) to be developed in cooperation with the decomissioning contractor.

All mitigation measures will also be compliant with the following overarching documents:

- Surat Gas Project (SGP) Species Impact Management Plan (SIMP) (Arrow Energy 2018) for managing potential impacts to EPBC Act listed species and communities (Australia).

- Arrow Energy Species Management Program for Tampering with Animal Breeding Places Part A Construction Activities (ORG-ARW-HSM-PLA-00070, Arrow Energy 2023).
- Fauna Management Procedure (ORG-ARW-HSM-PRO-00067, Arrow Energy 2025).
- Fauna Management Guideline (ORG-ARW-HSM-GUI-00103, Arrow Energy 2025).
- Biodiversity Standard (ORG-ARW-HSM-STA-00001).
- Land Disturbance Guideline (ORG-ARW-HSM-GUI-00094, Arrow Energy 2025). A copy of the Land Disturbance Guideline is provided as .
- Arrow Energy's Biosecurity Procedure (ORG-ARW-HSM-PRO-00187). A copy of the Biosecurity Procedure is provided as **Appendix K**.
- Arrow Energy's Vehicle and Machinery Hygiene Procedure (ORG-ARW-HSM PRO-00138). A copy of the Hygiene Procedure is provided as **Appendix L**.

As these overarching documents have not been developed with consideration of the site-specific aspects of the solar farm site, the measures detailed in this subsection (**Section 8.2**) identify those which will, as a minimum, be specifically implemented for this Project.

The site-specific CEMP, OEMP, DEMP, Construction Rehabilitation Plan and Decommissioning/Final Rehabilitation Plan will develop and present further and more detailed mitigation measures that will include detailed performance and completion indicators, trigger values, corrective actions and a detailed monitoring schedule. All mitigation measures in these Plans will consider the 'S.M.A.R.T' principles, with the aim of being specific, measurable, achievable, relevant and timebound. The mitigation measures detailed in this subsection (**Section 8.2**) are a summary of those that will be included within these more detailed plans and are specific, measurable, achievable, relevant and timebound. As summary of the minimum monitoring activities relating to the success of the proposed mitigation activities for EPBC Act species is provided in **Section 8.3**.

Performance and completion timeframes are noted where relevant to the Project specific measures described where relevant within **Sections 8.2 and 8.3**.

Applicable conservation advice and other statutory documents related to mitigation measures for each MNES species are outlined in **Section 8.2.5**. In summary, the proposed measures are not inconsistent with the DCCEEW SPRAT Database, approved conservation advice or recovery plans (where available) for the relevant species.

Arrow CSG and its contractors will comply with all environmental laws and regulations relating to protecting and conserving fauna (including the EPBC Act and the *Nature Conservation Act 1992* (Queensland)). Arrow CSG will also comply with its duty of care under the *Animal Care and Protection Act 2001* (Queensland) to provide for the ethical treatment of animals encountered during its activities.

8.2.1 Construction Phase

8.2.1.1 Fauna Spotter-Catcher surveys and activities

For new work sites or modifications to existing developments where potential fauna habitat will be disturbed, a pre-clear survey will be undertaken to confirm on-the-ground biodiversity values generally about 2 months prior to site preparation activities (e.g. vegetation clearing, excavations) commencing. The pre-clear and walk-though surveys will be completed by a suitably qualified and experienced person and implementation is the responsibility of the Site Supervisor. The pre-clear survey will include searches for fauna and fauna signs; and identify and recording known and potential fauna habitat features and breeding places.

The spotter-catcher survey will generally be confined to the area of disturbance and include searches for and potential relocation of fauna and breeding places. The spotter-catcher survey will be completed as close as practical (and no more than 48 hours) prior to all clearing and/or habitat disturbance works.

Spotter-catcher surveys will be completed for all clearing and vegetation and/or habitat disturbance works. In particular, a fauna spotter-catcher (FSC) will be present at all sites when site preparation activities (such as vegetation clearing, excavation, trenching) and/or construction activities pose an unacceptable risk of harm to fauna or where

identified fauna habitat features may be interfered with, removed, relocated or destroyed, whether intentionally or not. In particular, a FSC will be in attendance when works will result in:

- clearing of vegetation, grasslands and habitat features;
- moving of timber piles which have been in-situ for longer than 72 hours; or
- moving large, hollow bearing logs, rock piles or clearing termite mounts greater than 50 cm in diameter.

There will be at least one FSC for every two machines.

The FSC and other site personnel will undertake all relevant activities as described in the Arrow Energy Fauna Management Guideline (2019) and Fauna Spotter-catcher Work Instruction to ensure that harm to fauna is minimised.

The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that a FSC will be present during all disturbance to potential fauna habitat and will:

- Comply with the *Australian code for the care and use of animals for scientific purposes* (National Health and Medical Research Council, 2013) and *the Code of Practice: Care of Sick, Injured or Orphaned Protected Animals in Queensland* (DES, 2013).
- Operate with valid permits for the location where the work is being conducted and the tasks involved.
- Identify and demarcate areas of fauna habitat features (e.g. habitat trees, significant species / communities, rock piles, coarse woody debris, soil cracks and other cavities, termite mounds, etc.) in the field using high visibility flagging tape, hazard netting or similar.
- Identify and demarcate any key features relevant to threatened species, such as roosting sites or microhabitat features.
- Complete the MNES species-specific fauna surveys detailed in **Table 8.1** within the proposed disturbance area.
- Ensure that the species-specific measures (including key habitat avoidance and relocation measures) detailed in **Table 8.1** and Section **8.2.1.2** are implemented in the event of any unexpected finds of MNES species within the proposed disturbance area.
- Identify actual or potential breeding areas of fauna species and ensure adequate protection or relocate the species and their breeding place where appropriate and in accordance with Arrow Energy's Species Management Program (under the Queensland *Nature Conservation Act 1992*).
- Ensure temporary fencing will be used to prevent fauna access to hazardous areas (e.g. open trenches / excavations and laydown areas) where required.
- Ensure that open trenches are regularly inspected and/or appropriate egress and shelter sites are provided.
- Ensure animals requiring removal and relocation are protected during vegetation clearing and other site preparation activities.
- Ensure removal of protected animals (including snakes) from plant, stationary machinery or vehicles or within site huts/offices will only be completed when the fauna is at risk of harm or when the fauna presents a risk to people or property. Removal and relocation of such fauna from infrastructure or property will only be conducted by a suitably qualified and experienced person who holds an appropriate Damage Mitigation Permit.
- Wear appropriate PPE and implement wildlife handling protocols that minimise the risk of spreading wildlife diseases.
- Identify the closest veterinary clinic and wildlife carer (if available in the locality) to the work site including after-hours phone numbers.
- Comply with all safety directions given by the Site Supervisor and understand, sign on and comply with the requirements of the contractor's Job Safety and Environmental Analysis (JSEA) for clearing operations. The JSEA must include communications protocols between the FSC and mobile plant operator.

- Record and report all interactions with fauna to the Ecologist (notification within 24 hours using the Fauna Incident Notification (FIN) form will be completed for any species listed as threatened, near threatened or special least concern under the EPBC Act or NC Act).
- All interactions with fauna (including all observations, relocations, injuries, mortalities of protected fauna will be recorded and reported to the Arrow CSG ecology representative and the regulator as required under the NC Act.
- Ensure fauna records kept and managed by Arrow CSG or the FSC will include:
    a. Fauna incident register including tampering with animal breeding places.
    b. Fauna spotter-catcher (FSC) reports.
    c. Fauna Incident Notification (FIN) forms.
    d. Known records of species listed as threatened, near threatened or special least concern under the EPBC Act or NC Act are recorded and stored in GIS.

The purpose of these FSC measures is to ensure that threatened species are detected and minimise the risk of accidental mortalities, injuries and stress to individual animals including potentially present MNES species during site preparation activities. The above measures are widely recognised as industry best-practice and are predicted to be effective in achieving the intended environmental outcome of detecting threatened species and minimising wildlife injuries and mortalities during site preparation activities.

Table 8.1 lists out the specific FSC and unexpected find measures that will be implemented in relation to each of the potentially impacted MNES fauna species. The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that each of these mitigation measures are implemented.

Table 8.1: FSC and unexpected find measures for potentially impacted MNES fauna species

Species	FSC and unexpected find measures
Corben's long-eared bat	• As close as practical (and no more than 48 hours prior) to vegetation clearing, all reasonable and practicable attempts (to the extent it safe to do so) will be made by the FSC to check (including, where required through the use of a cherry-picker, fibrescopes or borescopes) any trees with hollows that may be suitable for Corben's long-eared bat, hollow logs, peeling/decorticating bark and splits in tree trunks for the presence of roosting Corben's long-eared bat. • Should an unexpected find occur within the proposed clearing/disturbance area: – all works within 50 m of the find would stop immediately – NEPA would be notified of the find within 48 hours – a minimum 50 m exclusion area would be clearly demarcated around the find – the entire Development footprint would be resurveyed for Corben's long-eared bat (additional exclusion area would be established should other roosts be found to be present) – a new species-specific significant impact assessment and a new species-specific impact management plan (including any proposed ongoing management actions and monitoring requirements) would be completed and submitted to both NEPA and DETSI for their consideration and comment – all works within the exclusion area would remain on hold until any feedback from both NEPA and DETSI was incorporated into the significant impact assessment and impact management plan – salvage of all potentially suitable tree hollows would be attempted for relocation into adjoining vegetated areas (outside the clearing footprint) • Should an unexpected find occur and relocation of Corben's long-eared bats in tree hollows be required, the following management actions would be followed:

Species	FSC and unexpected find measures

- an elevated work platform or cherry-picker may be used in conjunction with a chainsaw operator and the FSC (or a FSC who holds a current training qualification in use of chainsaws) to attempt to remove the hollow.
- The step-by-step process is detailed below (modified from Nottidge 2012) and will be considered if safe to do so:
  - The FSC (with chainsaw operator unless the FSC is a qualified chainsaw operator) will inspect each visible hollow or potential breeding place (e.g. nest) identified in each tree using the cherry picker. This is usually carried out by simply looking into hollows and nests (with the assistance of a small torch); however, fibrescopes or borescopes may also be useful for deep hollows.
  - If Corben's long-eared bats are located within a hollow, a piece of towel, calico catch bag or rag would be firmly placed in the entrance to prevent the wildlife from escaping, as arboreal fauna may attempt to flee the nesting/denning hollow, risking injury to the animal.
  - Once the hollow entrance has been secured, the chainsaw operator will remove the entire hollow limb below the cavity where the branch remains solid. In circumstances where a hollow continues into the main stem of the tree, the chainsaw operator would carefully cut a small window into the hollow, allowing the FSC to plug the hollow above and below the window, then the hollow limb is removed and lowered to the ground in sections.
  - When the bats have been safely secured within their hollow, the entire limb would then be placed in the cherry-picker bucket or lowered to the ground using ropes (depending on the size of the limb).
  - This limb would be placed in a cool, quiet location until translocation to the recipient habitat site, when at dusk of the same day the hollow entrance will be re-opened to allow the bats to emerge of their own accord.

- In instances where a tree is inhabited by Corben's long-eared bat, but is not a maternity roost, the felled tree will be left, for 24 hours to allow any hidden or unreachable microbats to relocate overnight of their own volition. Entrances to hollows / cracks / crevices will be plugged with calico bags, until the end of the workday to ensure that the bats do not take flight during daylight hours, risking predation from raptors and corvids.
- In the case of an unexpected find of an active Corben's long-eared bat maternity roost within the Development footprint (possible from late spring to mid-summer), the following hierarchy will be followed:
  - Delaying and rescheduling clearing the tree until the young have fledged.
  - If the above is not possible and all avenues listed above have been exhausted, the following will be actioned by the FSC:
    - if juveniles are abandoned before or after tree felling, all animals will be relocated to bat-box or similar (such as a small empty salvaged hollow).
    - an exclusion zone of 30 m will be established, and the bat-box or similar will be attached to a tree as close as possible to the felled tree (even if within the clearing area), allowing for female microbats to return and take their juveniles of their own accord. The closer the juveniles are to the original tree, the higher the likelihood of females returning. Female microbats will find and remove their juveniles at night via call recognition.
  - the bat-box/hollow will be reinspected the morning of the following day and any remaining bats will be taken to a suitable carer immediately.

Species	FSC and unexpected find measures
	▪ the carer will be notified the night before to arrange prompt collection of juveniles, if needed. • As a last resort, young may be removed and placed with a licensed wildlife carer/facility for raising of the young for subsequent release. • Should any injured Corben's long-eared bat (or other MNES fauna) be found, a veterinary centre, wildlife hospital, or wildlife expert will be contacted and care arranged for the individual. In such cases, any individual bat will not be held for more than four hours unless access to care must take longer in which case food and water will be provided and the bat will be held in an enclosure (e.g. pet enclosure or bag) for no more than 12 hours.
Koala	• The FSC will be present immediately prior to and during all clearing and construction and FSC will search all trees to be cleared for koalas. • In accordance with the Queensland *Nature Conservation (Koala) Conservation Plan 2017*, when clearing Koala habitat the spotter-catcher must be a 'koala spotter who has the primary role of locating koalas in the trees'. A Koala spotter is a 'person who has qualifications and experience, or demonstrated skills and knowledge, in: ▪ locating koalas in koala habitats; or ▪ conducting arboreal fauna surveys. • Although not expected, if a koala is found within the clearing footprint, the measures detailed in **Section 8.2.1.2** will be implemented. • The FSC will not be authorised to capture a koala from a tree, unless specifically outlined in their rehabilitation permit or other DETSI approved permit. Koalas can disperse over 100 m when left overnight, however, if a koala is not dispersing of its own volition after 72 hours, DETSI will be contacted for further advice. • In the case of an unexpected find prior to or during clearing, the FSC will be required to confirm that koalas have safely moved out of the area of works of their own volition (or, after 72 hours and with DETSI agreement, have been relocated by the FSC) before any/further koala habitat is cleared, construction is undertaken or construction continues to be undertaken. • Trenches and excavations will be inspected and monitored as per the APGA Code of Environmental Practice (APGA 2022) and will be checked within two hours of sunrise and trapped fauna released. Additional monitoring will be undertaken following rainfall events. • The time a trench / excavation is left open will be minimised. • As soon as practical following completion of works, trenches and excavations will be backfilled with excavated material, compacted and topsoil replaced and erosion controls implemented. • Should any injured koala be found, a veterinary centre, wildlife hospital, or wildlife expert will be contacted and care arranged for the individual. In such cases, any individual koala will not be held for more than four hours unless access to care must take longer in which case food and water will be provided and the koala will be held in a bag for no more than 2 hours or an enclosure (e.g. pet carrier) for more than 4 hours.
South-eastern glossy black-cockatoo	• Immediately prior to and during clearing, the FSC will search trees for south-eastern glossy black-cockatoo, with an emphasis of their preferred foraging habitat trees (i.e. buloke within areas of regrowth RE 11.5.1. • In the case of an unexpected find of south-eastern glossy black-cockatoo individuals within the proposed clearing area, the FSC will check that any south-eastern glossy black-cockatoo self-relocate prior to vegetation clearing or foraging habitat disturbance (the site does not contain hollow that are suitable for south-eastern glossy black-cockatoo).

Species	FSC and unexpected find measures
	• Should any injured south-eastern glossy black-cockatoo be found, a veterinary centre, wildlife hospital, or wildlife expert will be contacted and care arranged for the individual. In such cases, any individual bird will not be held for more than four hours unless access to care must take longer in which case water will be provided.
Squatter pigeon	• Immediately prior to clearing, the FSC will search the ground for squatter pigeon, including through 'flush surveys' on foot across the site. • In the case of an unexpected find of squatter pigeon individuals within the proposed clearing area, the FSC will check that any squatter pigeon self-relocate prior to vegetation clearing or habitat disturbance. • Should any injured squatter pigeon be found, a veterinary centre, wildlife hospital, or wildlife expert will be contacted and care arranged for the individual. In such cases, any individual bird will not be held for more than four hours unless access to care must take longer in which case water will be provided.
Diamond firetail	• The FSC will search all low and ground layer vegetation and shrubs for diamond firetail (and their bottle-shaped nests) across the site. A final search for nests will be completed immediately prior to vegetation clearing commencing. • In the case of an unexpected find of diamond firetail individuals within the proposed clearing area, the FSC will check that any diamond firetail self-relocate prior to vegetation clearing or habitat disturbance. • Should an unexpected find of a diamond firetail nest occur: ▪ all works within 50 m of the nest(s) would stop immediately ▪ NEPA would be notified of the nest find within 48 hours ▪ a minimum 50 m exclusion area would be clearly demarcated around the nest find ▪ the entire Development footprint would be resurveyed for diamond firetail nests ▪ (additional exclusion areas would be established should other nests be found to be present) • In the case of an unexpected find of an active nest (containing eggs or chicks) within the proposed clearing area, the following hierarchy will be followed: ▪ Delaying and rescheduling clearing the nest area/tree/shrubs until the chicks have fledged. ▪ If the above is not practical and all avenues listed above have been exhausted, the FSC will attempt to relocate the nest and reunite the eggs or chicks with the parents. To relocate an active nest: – The relocation site will be located in adjacent retained vegetation, far enough away from future earthworks areas but close enough to the original nest site that the parents will have the best chance of reuniting with the nest – As much of the nest would be collected as possible and the eggs or chicks kept in the original nest. If the nest is unstable or only the soft inner portion of the nest can be salvaged, it would be placed in a suitably sized similar shaped container made of a durable material. – The nest would be secured into retained vegetation at the relocation site using zip ties, string/rope, or similar. – All attempts would be made to ensure the parents can find and follow the active nest. This can be done by playing species-specific chick sounds from a small speaker if the chicks aren't calling. The nest may need to be moved gradually to allow the parents to find it again over time (e.g. moving the nest a few meters until the parents find it again each time). The nest would only

Species	FSC and unexpected find measures
	be left once adults are confirmed to be attending the chicks or eggs. If the adults do not return, removal of eggs/chicks will be undertaken. • Where the removal of eggs or chicks is required, a suitably qualified and licensed wildlife carer/facility will be engaged to incubate eggs removed and raise young animals. Eggs or young will not be destroyed unless as a last resort and then only under an approved damage mitigation permit. • Should any injured diamond firetail be found, a veterinary centre, wildlife hospital, or wildlife expert will be contacted and care arranged for the individual. In such cases, any individual bird will not be held for more than four hours unless access to care must take longer in which case water will be provided.
Dunmall's snake	• Within 48 hours prior to clearing and habitat disturbance, the FSC will check within any suitably sized soil cracks and other cavities and termite mounds (through the use of fibrescopes or borescopes) and under fallen timber for Dunmall's snake and their eggs (egg laying expected to be limited to between October and February. • Should an unexpected find of a Dunmall's snake occur: ▪ all works within 50 m of the find would stop immediately ▪ NEPA would be notified of the find within 48 hours ▪ A minimum 50 m exclusion area would be clearly demarcated around the find ▪ the entire Development footprint would be resurveyed for Dunmall's snake ▪ (additional exclusion areas would be established should other there be any other finds) ▪ a new species-specific significant impact assessment and a new species-specific impact management plan (including any proposed ongoing management actions and monitoring requirements) would be completed and submitted to both NEPA and DETSI for their consideration and comment ▪ all works within the exclusion area would remain on hold until any feedback from both NEPA and DETSI was incorporated into the significant impact assessment and impact management plan. • In the case of a find of a clutch of reptile eggs during pre-clear surveys and clearing which could potentially be Dunmall's snake eggs, the eggs will be collected and placed with a suitably qualified and licensed wildlife carer/facility for incubation and release of hatched offspring. Small plastic containers containing a mixture of vermiculite and water (1:1 by weight) are suitable and will be used for transport of reptile eggs. Containers with eggs will be kept cool (e.g. in a portable cooler) and kept out of direct sunlight. • Trenches and excavations will be inspected and monitored as per the APGA Code of Environmental Practice (APGA 2022) and will be checked within two hours of sunrise and trapped fauna released. Additional monitoring will be undertaken following rainfall events. • The time a trench / excavation is left open will be minimised. • As soon as practical following completion of works, trenches and excavations will be backfilled with excavated material, compacted and topsoil replaced and erosion controls implemented. • Should any injured Dunmall's snake be found, a veterinary centre, wildlife hospital, or wildlife expert will be contacted and care arranged for the individual. In such cases, any individual snake will not be held for more than four hours unless access to care must take longer in which case water will be provided within 24 hours and the snake will be held in an enclosure (e.g. pet enclosure or bag) for no more than 24 hours.

Species	FSC and unexpected find measures
	• The FSC shall only capture Dunmall's snake where necessary to ensure animal or personnel safety. In such cases, the individual snake shall be caught using a snake hook or grippers and hoop bag (recording details of the capture and release).

The performance and completion criteria that will be used to monitor the effectiveness of the FSC and unexpected find measures will include:

- FSC surveys of Development footprint areas completed prior to (and within 48 hours of) all clearing and habitat disturbance (comparison of FSC reports and site work records)
- FSC presence during all site fauna habitat disturbance works (assessed by at least weekly inspections by site environmental representative (recorded in their site inspection reports) and comparison of FSC reports and site work records).
- Fauna encounter, mortality and injury records (as recorded in the FSC Fauna Interactions Report, FIN form and/or Fauna Incident Register which is required to be maintained by the Project and provided to DETSI under the Queensland *Nature Conservation Act 1992*).
- Within areas of potential breeding habitat for Corben's long-eared bat, initial vegetation clearing is limited to non-habitat trees and habitat trees are removed one at a time and subject to FSC inspection the following day (demonstrated within site work records).
- Stop work buffers are immediately enacted and maintained in the event of an unexpected MNES find.
- All potentially suitable tree hollows salvaged and relocated to adjacent areas in the event of an unexpected Corben's long-eared bat find.
- In the event of an unexpected MNES fauna find, MNES fauna allowed to disperse of their own volition.
- In the case of an unexpected find of an occupied Diamond Firetail nest works delayed until the chicks have fledged or all eggs/chicks relocated by FSC to adjoining area, Where this is not practical, eggs/young will be removed and a suitably qualified and licensed wildlife carer/facility will be engaged to incubate eggs and/or raise chicks. Eggs or young will not be destroyed unless as a last resort and then only under an approved damage mitigation permit.
- Temporary fauna exclusion fencing in place around all open trenches and laydown areas (recorded in site environmental representative site inspection reports).
- Regular FSC inspection of open trenches (recorded in FSC record).
- No MNES fauna harmed injured or killed (recorded in FSC Fauna Interactions Report and FIN form and Project Incident Reports).

Should an unexpected find occur of any other MNES species, the Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that:

- all works within 50 m of the find would stop immediately
- NEPA would be notified of the find within 48 hours
- a minimum 50 m exclusion area would be clearly demarcated around the find
- the entire Development footprint would be resurveyed for MNES species found
- requirements for ongoing monitoring for the species will be specified and implemented during construction (and operation where relevant).

Where an impact to the MNES species is likely, the Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that:

- a new species-specific significant impact assessment and a new species-specific impact management plan would be completed and submitted to both NEPA and DETSI for their consideration and comment

- all works within the exclusion area would remain on hold until any feedback from both NEPA and DETSI was incorporated into the significant impact assessment and impact management plan
- ongoing monitoring actions would be specified in the impact management plan.

No mortalities or injuries to MNES species are anticipated as a result of the Project. However, should an unexpected event, such as mortality or injury to an MNES species occur, Arrow CSG will be responsible for ensuring that NEPA are advised in accordance with the Project's approval conditions and in writing within a short period (e.g. within 7 days) of Arrow becoming aware of the incident. All such incidents will be reported on an Incident Report Form and registered in an electronic database. GPS co-ordinates will be recorded for any individual that was captured, relocated, injured or killed. The information provided to NEPA will include the listed threatened species, the date on which the incident took place, the activity being undertaken at the time of the incident, and the immediate actions taken as a result of the death. Such incidents will be assessed and tracked to ensure that the appropriate investigation, corrective actions and measures are taken to prevent the incident from reoccurring.

Incidents will be reviewed by Arrow CSG on a monthly and annual basis to determine incident trends, which will enable targeting of areas that require further adaptive management to assist in preventing future incidents. While the review of incidents will occur monthly, Arrow CSG's reporting of such trends will be annual in accordance with the Project's approval conditions.

8.2.1.2 Koala habitat clearing measures

The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that if Koala are observed to be present during any tree clearing activities the following mitigation measures will be implemented:

- Clearing of koala habitat trees will be carried out in a way that ensures koalas occupying the area that is being cleared have enough time to move out the area being cleared without human intervention.
- A minimum exclusion zone of 100 m will be established for a female koala with obvious young and 50 m for all other koala, until the animal has moved of its own accord. No vehicles will enter the buffer (exclusion) zone at any time. Vehicle operators will be made aware of the presence of the koala and a reduced speed limit established until the animal has moved on of its own accord.
- Where an exclusion zone is established, it will also include an escape corridor to allow Koalas to move through a vegetated corridor to adjacent retained vegetation outside of the clearing footprint.
- Clearing will be carried out in stages with no more than 3 ha being cleared in any one stage.
- Between each stage, there will be at least one period of 12 hours (starting at 6pm on a day and ending at 6am on the following day) where no trees are cleared on the site.
- The clearing of koala habitat trees will be carried out in a way that ensures appropriate habitat links are maintained within the area being cleared and the adjacent area to ensure any koalas occupying the site can safely move off the site.
- If a koala is in a tree, that tree will not be cleared whilst the koala remains in the tree.
- If the crown of a tree overlaps with a tree that a koala is in, that tree will not be cleared whilst the koala remains in the overlapping tree.

The purpose of the koala habitat clearing measures are to minimise the risk of mortalities, injuries and stress to individual koalas during clearing activities. The measures are in accordance with the Queensland Government's *Information Sheet – Nature Conservation (Koala) Conservation Plan 2017 – Koala Conservation Plan clearing* requirements (DES 2021) and are predicted to be effective in achieving the intended environmental outcome of minimising koala stress, injuries and mortalities during vegetation clearing activities.

The performance and completion criteria that will be used to monitor the effectiveness of these measures will include:

- Koala presence and relocation records during all clearing works (assessed by at least weekly inspections by site environmental representative (recorded in their site inspection reports) and comparison of FSC reports and site work records).
- Fauna encounter, mortality and injury records (as recorded in the FSC Fauna Interactions Report and/or Fauna Incident Register which is required to be maintained by the Project and provided to DETSI under the Queensland *Nature Conservation Act 1992*)
- No koala harmed, injured or killed.

8.2.1.3 General vegetation clearing mitigation measures

Beyond the mitigation measures related to FSC surveys and activities and koala-specific measures described above, The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that the following general vegetation clearing mitigation measures are also implemented:

- Clearing of native vegetation will be minimised to that necessary for safe construction and operational activities.
- Clearing of vegetation will be in accordance with the EPBC Act approval conditions and relevant permits.
- Clearing boundaries will be clearly demarcated in the field (i.e. high visibility flagging tape, hazard netting or similar)
- No land disturbance or vegetation clearing will be undertaken without appropriate internal authorisation and approval.
- Cleared vegetation will be placed at the designated location for re-use during site rehabilitation. If woody vegetation is being cleared by mechanical means, stumps and roots will be grubbed and stockpiled.
- Any vegetation not specified to be stockpiled or retained will be mulched. Mulched material will be reused on site for erosion control or sediment control.

Unless an MNES fauna species is found to be present on the site it is anticipated that the entire site will be cleared in approximately 2-5 days. This timeline will be extended and a direction of clearing established if any MNES fauna species is observed on site in accordance with **Section 8.2.1.2** for Koala or, for all other MNES fauna species as directed by the FSC at the time of becoming aware of any MNES individuals on the site. Should a MNES individual be observed on site, all clearing activity will stop until the relevant mitigation measures specified in **Table 8.1**. are completed. The direction of clearing will be determined based on the location of the individual and the most likely directions for existing the area (as determined by the FSC). Clearing work will not commence without the written authorisation of the FSC and the clearing direction and schedule would be developed and monitored by the FSC.

The mitigation measures specified in **Sections 8.2.1.1** and **8.2.1.2** will facilitate the escape of any MNES fauna present and minimise the risk of fauna injury and mortality during clearing operations.

The purpose of these general vegetation clearing mitigation measures is to avoid damage to retained vegetation areas and fauna habitats and minimise the risk of injuring fauna. The above measures are widely recognised as industry best-practice and are predicted to be effective in achieving the intended environmental outcome of avoiding damage to retained vegetation areas and habitats.

The performance and completion criteria that will be used to monitor the effectiveness of these general vegetation clearing measures will include:

- Limited damage to trees and vegetation within retained areas.
- No unauthorised encroachment into retained vegetation area has occurred
- No MNES fauna harmed, injured or killed.

The effectiveness of these measures will be recorded in site inspection reports from the daily inspections by the site environmental representative in the lead up to and during site clearing activities.

8.2.1.4 Weed and pest management

Weeds and pests will be managed during construction in accordance with Arrow Energy's Biosecurity Procedure (ORG-ARW-HSM-PRO-00187, provided as **Appendix K**.) and Arrow Energy's Vehicle and Machinery Hygiene Procedure (ORG-ARW-HSM PRO-00138, provided as **Appendix L**). The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that all weed and pest measures described below are implemented. Weed and pest management measures to be implemented for construction stage of the Project will be documented within a Weed and Pest Management section within the CEMP and will include:

- The work site and access routes will be inspected for notifiable weeds and pest plants and animals prior to accessing the site.
- Clean downs of vehicles and equipment that have potentially been in contact with weeds will be completed before entering the work site.
- Records of inspections and clean down records will be maintained (and periodically audited).
- If any washdown facilities are established on site, they will be designed to ensure that runoff is contained on site and does not transfer weed seeds, spores or infected soils to adjacent areas.
- When sourcing maintenance materials, materials such as bedding sand, topsoil, straw bales and sandbags will be brought to site only after it is ascertained that the materials are not contaminated with weeds and plant or animal pathogens. A weed hygiene declaration form will be requested from the supplier where there is possible risk of contamination in products.
- Regular inspections for pest flora and evidence of pest fauna will be undertaken within disturbed areas.
- All relevant personnel will be advised of the location and extent of any weed infestations in the vicinity of the work area.
- When sourcing construction and rehabilitation materials, materials such as bedding sand, topsoil, straw bales and sandbags will be brought to site only after it is ascertained that the materials are not contaminated with weeds and plant or animal pathogens. All loads where there is possible risk of contamination in products must have a current hygiene declaration.
- Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact MNES species.

The purpose of these weed and pest management measures is to minimise the risk of introducing new weeds or pests or spreading existing weeds or pests into the areas adjoining the project infrastructure and Development footprint (thereby reducing the condition of retained MNES species habitats in the adjoining areas). The above measures are widely recognised as being effective good practice for achieving the intended environmental outcome of avoiding introduction and spread of weeds and pests.

The performance and completion criteria that will be used to monitor the effectiveness of these weed and pest measures will include:

- Complete weed hygiene logbooks completed for all site vehicles and machinery.
- Absence of any new weed and pest species (as reported from regular inspections for weed and pests).
- Weed cover within disturbed areas no higher than that in adjoining areas.
- No increase in the abundance pests.

The effectiveness of these measures will be recorded in site inspection reports from at least weekly inspections by the site environmental representative throughout construction.

8.2.1.5 Fire management measures

The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that the following fire management measures are implemented during construction:

- A site-specific Emergency Management Plan will be developed.
- The operational APZ will be cleared as part of the initial site establishment works and activities involving a potential ignition source will be conducted inside the defined APZ.
- Fire-fighting equipment will be installed, inspected and serviced in accordance with risk assessments and relevant legislation and standards.
- Fire-safety equipment will be commissioned in the early phase of the construction period.
- All vehicles will carry adequate firefighting equipment including a fire extinguisher.
- All buildings and facilities will be fitted with smoke or fire alarms.
- Deliberate fires will be prohibited.
- Protocols will be developed for the control of construction activities during extreme fire danger periods.
- Access tracks will be kept clear of dry grass and combustible material where there is a higher risk of bushfire (to minimise the risk of dry grass being ignited by hot components of vehicles accessing the sites).

The performance and completion criteria that will be used to monitor the effectiveness of these fire management measures will include:

- Appropriate emergency fire-safety equipment available on site.
- All buildings and facilities will be fitted with smoke or fire alarms.
- No evidence of deliberate fires.

The effectiveness of these measures will be recorded in site inspection reports from at least weekly inspections by the site environmental representative throughout construction.

8.2.1.6 Soil and fine particle/dust management measures

Soils will be managed in accordance with the Arrow Energy – Land Disturbance Guideline (ORG-ARW-HSM-GUI-00094) and soil management measures to be implemented for the Project will be documented within the soils, erosion and sedimentation and/or rehabilitation sections within the CEMP. The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that the following mitigation measures are implemented:

- A soil survey of the Development footprint will be completed and will include field inspection, recording of soil features and sampling of soils/soil layers that may present special problems when disturbed (e.g. soil dispersion, soil acidity, soil salinity).
- Topsoil will be stripped according to designated profile depths, subject to further field investigations during stripping.
- Stripped material will be placed directly onto area to be rehabilitated and spread immediately (if rehabilitation sequences and weather conditions permit) to minimise the requirement for stockpiling.
- Topsoil will be stripped, salvaged and stockpiled separately from subsoils.
- Soils will be separated into windrows for later collection or re-spreading to minimise compression effects of heavy equipment.
- The surface of soil stockpiles will be left in as coarsely structured a condition as possible to promote infiltration and minimise erosion until vegetation is established or suitable erosion controls have been applied, and to prevent anaerobic zones from forming.
- Topsoil stockpiles will be a maximum of 2 m high.
- Topsoil stockpiles will have a maximum batter gradient of 33% (1V:3H).
- Long-term (>12 month) stockpiles will be stabilised and planted with appropriate cover crop and/or sprayed with stabilisers.

- Long-term (>12 month) subsoil stockpiles will be capped with at least 100 mm of topsoil.
- Construction will be conducted in a manner that limits the duration of exposure of soils.
- Inverting of soil during clearing and grubbing operations will be avoided.
- Watering of exposed soils will be undertaken where required to ensure dust levels are kept within acceptable limits.
- Stabilise disturbed areas as soon as works are completed.
- Further relevant management measures are listed in **Section 8.2.1.7** .

The purpose of these soil management measures is to minimise the risk of erosion and facilitate rehabilitation within disturbed areas as well as to avoid indirect sedimentation and dust impacts upon retained MNES species habitats adjoining the Development footprint. The above measures are widely recognised as being effective good practice for achieving the intended environmental outcomes of minimising erosion and dust in the short and long terms.

The performance and completion criteria that will be used to monitor the effectiveness of these soil management measures will include:

- Soil survey completed prior to commencement of construction activities.
- Topsoils stored separately from subsoils.
- Suitable erosion controls applied to soil stockpiles.

The effectiveness of these measures will be recorded in site inspection reports from at least weekly inspections by the site environmental representative throughout construction.

Fine particle/dust will be managed in accordance with Arrow Energy's Dust Management Guideline (ORG-ARW-HSM-GUI-00050). Dust management measures to be implemented for the Project will be documented within the CEMP and will include controls such as:

- Construction dust
  - Limit on-site vehicle speeds.
  - Replace ground cover in disturbed areas as soon as practicable.
  - Cover truck loads containing dirt, sand, soil or other loose material prior to transportation.
  - Use gravel aprons adjacent roads to reduce mud/dirt track out.
- Material handling
  - Apply water sprays at material transfer points and to material stockpiles.
- Unpaved roads
  - Limit maximum on-site speeds.
  - Apply water to reduce dust potential for roads that may receive high levels of traffic.

8.2.1.7 Erosion and sediment control and stormwater (ESC) management measures

Effective Erosion and Sediment Control (ESC) including stormwater management requires that critical steps are undertaken during the mobilisation phase and during site disturbance. Reference will be made to Appendix H of the Arrow Energy – Land Disturbance Guideline (ORG-ARW-HSM-GUI-00094, **Appendix J**) for a guide to the erosion and sediment control process.

To mitigate the potential impacts to sediment and erosion, a Stormwater Management Plan (SMP) will be prepared for the Project. This plan will identify key water quality risks, management of such, including where ESC is required.

The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that the following ESC management measures are implemented:

- A site-specific Erosion and Sediment Control Plan (ESCP) will be developed and maintained in accordance with the International Erosion Control Association (IECA) (2008) Best Practice Erosion and Sediment Control

guidelines. All proposed ESC measures will be implemented in advance of, or in conjunction with clearing and ground disturbance activities.

- The site-specific ESCP will be certified by a suitably qualified and experienced person prior to construction.
- Appropriate ESC structures will be installed and maintained throughout construction.
- The ESCP will include:
  - Identification of higher-risk areas within the Development footprint.
  - Stabilisation methods to be applied in areas of unfinished/exposed earthworks.
  - Locations and requirements for temporary and permanent drainage to control surface water movement across the site.
  - Locations and designs of any required sediment traps.
- Drains will not be cut into dispersive soils unless the drain is lined with a minimum of 100mm deep non-dispersive soil or gypsum-amended soil prior to lining with the nominated material (e.g. spray-on ditch lining/ geofabric etc.).
- A marker peg or post will be placed in sediment basins to identify the water and sediment zones. Any water retained within the sediment zone can be retained for use on site for dust suppression or construction if required.
- Sediment basins will be treated and dewatered as soon as practical so that they are empty before the next rainfall event.
- All water released to land from Arrow CSG sites will comply with the quality limits detailed in the site specific ESCP.

The purpose of these ESC management measures is to minimise the risk of erosion and facilitate rehabilitation within disturbed areas as well as to avoid indirect sedimentation impacts upon retained MNES species habitats adjoining the Development footprint. These measures are in accordance with the IECA best practice guidance and are widely recognised as being effective in achieving the intended environmental outcomes of minimising erosion in the short and long terms.

The performance and completion criteria that will be used to monitor the effectiveness of these ESC management measures will include:

- Site-specific ESCP in place and certified prior to commencement of construction activities.
- Appropriate sediment and erosion control structures installed and maintained throughout construction.
- Minimal areas of active erosion present.
- Treatments identified and implemented to address any areas of active erosion.
- No significant deposition of sediments off-site.

The effectiveness of these measures will be recorded in site inspection reports from at least weekly inspections by the site environmental representative throughout construction.

8.2.1.8 Site access and housekeeping measures

The Project Construction Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that the following site access and housekeeping measures are implemented during construction:

- Signage will be in place to advise third parties of access restrictions.
- Personnel will stay within areas approved for construction and not enter exclusion areas or 'no-go' zones.
- All rubbish and waste materials will be disposed of in the appropriate bins, or in the absence of bins, removed daily from site. All personnel will ensure that sites remain litter free.
- Feeding of native animals will be prohibited.

- All handling of native animals will be undertaken by suitably qualified and experience people who have had formal training in capturing and handling native fauna.
- Unauthorised firearms, traps, nets or pets will be prohibited.
- Directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation and attraction of nocturnal fauna and minimise the risk of impacts on MNES species (especially to ensure no unplanned impacts to Corben's long-eared bat, greater glider or koala).
- Appropriate international, Australian and industry standards and codes of practice will be applied for the transport, handling and storage of hazardous materials, such as chemicals, fuels and lubricants.
- Appropriate spill response equipment including containment and recovery equipment will be available onsite.
- Staff will be trained on appropriate handling, storage and containment practices for chemical, fuels and other potential chemicals as relevant.

The purpose of these site access and housekeeping measures is to avoid unauthorised and light and waste related impacts upon MNES species which may potentially occur in areas adjoining the Development footprint. These measures are standard construction industry practice and are predicted to be effective in achieving the intended environmental outcomes of avoiding unauthorised and light and waste related impacts to MNES.

The performance and completion criteria that will be used to monitor the effectiveness of these site access and housekeeping management measures will include:

- Site access signage in place, including prior to commencement of construction activities.
- Absence of firearms, traps, nests and pests.
- Hazardous materials being appropriately handled.
- Appropriate emergency spill response equipment on site.
- Absence of waste left at the site.

The effectiveness of these measures will be recorded in site inspection reports from at least weekly inspections by the site environmental representative throughout construction.

8.2.1.9 Training and awareness measures

The Project Construction Managers (Arrow CSG and Third Party Contractor) will ensure that employees and contractors conducting construction activities on site are made aware of any site-specific flora and fauna requirements relevant to their activities through internal approvals, prestart meetings, the site-specific CEMP, site-specific toolbox talks, inductions or training programs.

Intentional disturbance of fauna will be prohibited (unless authorised under approvals or permits and conducted by a suitably qualified and experienced person).

Training and inductions will cover:

- environmental obligations responsibilities under the EPBC Act Controlled Action conditions of approval.
- environmental obligations responsibilities under the *Environmental Protection Act 1994* (Qld), *Environmental Protection Regulation 2008* (Qld) and the Environmental Authority.
- requirements of this EMP and other project management plans and procedures.
- environmental hazards and control measures.
- emergency, incident and spill response procedures and incident notification procedures.
- including duty to report environmental incidents.
- weed management and hygiene procedures.
- water and waste management obligations.

- fire prevention.
- interactions with flora and fauna.

Records of training and inductions will be maintained to demonstrate achievement of competence. Training and induction material will be reviewed following change, incident investigations and hazard studies.

The purpose of this training is to avoid accidental and unnecessary disturbance of individual animals including potentially present MNES species during construction. Such training is industry best-practice and is predicted to be effective in assisting in achieving the intended environmental outcome of minimising unnecessary wildlife disturbance.

The performance and completion criteria that will be used to monitor these measures will include:

- Presentation of flora and fauna information relevant to specific site construction and operational personnel (as evidenced by training/induction records, pre-start and tool-box meeting minutes and attendance records.
- Absence of unauthorised disturbances of fauna or flora (assessed by at least weekly inspections by site environmental representative (recorded in their site inspection reports)).

8.2.2 Operations Phase

8.2.2.1 Fencing and wildlife entrapment

The Project Operations Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that security fencing is installed around the perimeter of the Development footprint comprising an approximately 1.8 m tall fauna exclusion floppy top chain link fence based on best-practice fencing guidelines including the Queensland Department of Transport and Main Roads (DTMR 2025) Fauna Exclusion Fencing Standards (refer to **Plate 3.1**). No barbed wire will be used in the fence. The fencing will have a buffer area of approximately 20 m width in which are maintained clear of trees (so that koala would not be able to use trees to by-pass the exclusion fence and access the Development footprint).

The proposed fencing will:

- Minimise the risk of fauna, including koala, greater glider and Corben's long-eared bat from being injured and/or caught up in the fence.
- Minimise the risk of MNES fauna from entering the solar farm or becoming trapped in the Development footprint
- Facilitate fauna escape (through climbing over the outward facing floppy top) if an individual koala, greater glider or other fauna ever inadvertently enter the solar farm.

It is possible that wildlife will enter the fenced area. Removal of individual animals (including snakes) from operational plant, stationary machinery or vehicles or within site huts/offices will only be completed when the fauna is at risk of harm or when the fauna presents a risk to people or property. Removal and relocating such fauna from infrastructure or property will only be conducted by a suitably qualified and experienced person who holds an appropriate Damage Mitigation Permit.

Koala has not been recorded in the area but may periodically occur in the vicinity of the Development footprint in low numbers. The proposed fencing is predicted to be effective in excluding koala and other MNES species from the Development footprint. Should operational personnel ever find any evidence of koala or other MNES species in the Development footprint an investigation would be undertaken to identify the likely entry point and method and whether full exclusion is achievable. If full exclusion is not likely to be achieved the investigation will identify whether further methods (in addition to the permanent outward facing floppy top fencing) are required to ensure individuals do not remain trapped without shelter whilst in the site and to provide safe movement opportunities to get out of the solar farm (including sufficient information on the location and design of any identified safer movement infrastructure).

Any incidence of MNES fauna entrapment in the solar farm will be reported to NEPA in accordance with the EPBC Act approval conditions.

8.2.2.2 Firebreaks and fire management

The Project Operations Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that a 28-m wide APZ around the perimeter of the solar farm is slashed and maintained free of woody vegetation in accordance with the recommendations of the Project Bushfire Hazard Assessment and Management Plan (refer to **Appendix M**). This is the minimum width required to protect the solar farm infrastructure from potential bushfires.

Vegetation in the firebreak area will be maintained in a manner that limits the amount of combustible material in the buffer area. Slashing and mowing will only be undertaken in areas that have previously been disturbed.

Access tracks will also be kept clear of dry grass and combustible material where there is a higher risk of bushfire (to minimise the risk of dry grass being ignited by hot components of vehicles accessing the sites).

Daily operations will be managed with consideration of the fire danger current at that time. Deliberate fires will be prohibited, and all buildings and facilities will be fitted with smoke or fire alarms.

These measures are expected to be effective in preventing damage to solar farm infrastructure or spreading from or through the solar farm. The performance and completion criteria that will be used to monitor the effectiveness of these fire management measures will include:

- Development of a site-specific Emergency Management Plan.
- Appropriate emergency fire-safety equipment available on site.
- Combustible materials maintained at low levels within the APZ.
- All buildings and facilities will be fitted with smoke or fire alarms.
- No evidence of deliberate fire.
- No evidence of fire traversing site firebreaks.

The effectiveness of the firebreak and fire management measures will be monitored via visual inspections at least quarterly during the operation of the solar farm and reported at least annually.

8.2.2.3 Access tracks

The Project Operations Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that site access to the Project is through internal access roads developed as part of the broader SGP North development. These access roads coincide with approved clearing under EPBC 2010/5344 and do not form part of the proposed action. As shown in **Figure 3.2**, the Project itself includes 1.7 km of access tracks that will be required to allow operational personnel to access into/inside the solar farm. Project traffic will be confined to these designated access tracks.

During operations these Project tracks are expected to generally be used by 1-2 light vehicles on a daily basis. Additional vehicles and machinery may also use these tracks on an occasional basis when specific maintenance or repair activities are required. Overall vehicle and machinery use of the access tracks will be light.

Such light use represents low risk to fauna. Additionally, all vehicles will be restricted to a maximum speed of 40km/hour. Arrow CSG utilises IVMS to monitor compliance with all designated speed limits.

Given the low risk of collisions with MNES species, no additional mitigation measures are proposed.

The purpose of these access management measures is to minimise the risk of injury and mortality to MNES and other fauna species. These measures are widely recognised as being effective good practice for achieving the intended environmental outcome of minimising the risk of MNES fauna species injury and mortality due to collisions with vehicles and equipment.

Any incidence of vehicle collision with MNES fauna would be reported to NEPA in accordance with the relevant EPBC Act approval conditions.

8.2.2.4 Weed and pest management

In the operational phase, weeds and pests will again be managed in accordance with Arrow Energy's Biosecurity Procedure (ORG-ARW-HSM-PRO-00187, **Appendix K**) and Vehicle and Machinery Hygiene Procedure (ORG-ARW-HSM PRO-00138, **Appendix L**) and the Project Operations Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that all weed and pest measures described below are implemented. Weed and pest management measures to be implemented for the Project will be documented within a Weed and Pest Management section within the OEMP and will include:

- The work site and access routes will be regularly inspected for notifiable weeds and pest plants and animals.
- Clean downs of vehicles and equipment that have potentially been in contact with weeds will be completed before entering the work site.
- Records of inspections and clean down records will be maintained (and periodically audited).
- If any washdown facilities are established on site, they will be designed to ensure that runoff is contained on site and does not transfer weed seeds, spores or infected soils to adjacent areas.
- When sourcing maintenance materials, materials such as bedding sand, topsoil, straw bales and sandbags will be brought to site only after it is ascertained that the materials are not contaminated with weeds and plant or animal pathogens. A weed hygiene declaration form will be requested from the supplier where there is possible risk of contamination in products.
- All relevant personnel will be advised of the location and extent of any weed infestations in the vicinity of the Development footprint.
- When sourcing maintenance and rehabilitation materials, materials such as bedding sand, topsoil, straw bales and sandbags will be brought to site only after it is ascertained that the materials are not contaminated with weeds and plant or animal pathogens. All loads where there is possible risk of contamination in products must have a current hygiene declaration.
- Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact MNES species.

The purpose of these weed and pest management measures is to minimise the risk of introducing new weeds or pests or spreading existing weeds or pests into the areas adjoining the project infrastructure and Development footprint (thereby reducing the quality of retain MNES species habitats in the adjoining areas). The above measures are widely recognised as being effective good practice for achieving the intended environmental outcome of avoiding introduction and spread of weeds and pests.

The performance and completion criteria that will be used to monitor the effectiveness of these weed and pest measures will include:

- Weed certificates completed for all site vehicles and machinery (as evidenced by Project weed certification database)
- Absence of any new weed and pest species (as reported from regular inspections for weed and pests)
- Weed cover within disturbed areas no higher than that in adjoining areas
- No increase in the abundance pests.

The effectiveness of these weed and pest management measures will be monitored via visual inspections at least quarterly during the operation of the solar farm and reported at least annually.

8.2.2.5 Erosion and sediment control and stormwater management measures

Increases in impervious areas will be limited to the footprint of control buildings, batteries, and inverters which are estimated to constitute less than 10% of the total Development footprint. The Project Operations Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring a site-specific ESCP (which will include a SMP) is

developed, certified and implemented. The key mitigation measures that will be applied during operations include those detailed previously for the construction phases in **Section 8.2.1.7** .

8.2.2.6 Site access and housekeeping measures

The Project Operations Managers (Arrow CSG and Third Party Contractor) will be responsible for ensuring that a Hazardous Materials Management Plan and Waste Management Plan is developed and implemented for the operations phase and that the following site access and housekeeping measures are implemented throughout operations:

- Procurement of PFOS-free solar panels to eliminate the risk of PFOS contamination.
- Regular monitoring to detect damage to installed equipment.
- Signage will be in place to advise third parties of access restrictions.
- Personnel will stay within areas approved for operations (cleared work zones) and not enter exclusion areas or 'no-go' zones.
- All rubbish and waste materials will be disposed of in the appropriate bins, or in the absence of bins, removed daily from site. All personnel will ensure that sites remain litter free.
- Feeding of native animals will be prohibited.
- Unauthorised firearms, traps, nets or pets will be prohibited.
- Light spill from the project will be minimised to reduce disturbance to nocturnal fauna and minimise the risk of impacts on MNES species (especially to ensure no unplanned impacts to Corben's long-eared bat, Greater Glider or Koala). Operational lighting will be designed to minimise spill and glare, using downward-facing, shielded, and motion-activated fixtures where feasible and will have regard to best practice measures set out in the *National Light Pollution Guidelines for Wildlife* (DCCEEW, 2023c). Lighting will be restricted to essential safety and security functions and positioned to avoid unnecessary illumination of adjacent vegetation and fauna habitats.
- Appropriate international, Australian and industry standards and codes of practice will be applied for the transport, handling and storage of hazardous materials, such as chemicals, fuels and lubricants
- Appropriate spill response equipment including containment and recovery equipment will be available onsite
- Staff will be trained on appropriate handling, storage and containment practices for chemical, fuels and other potential chemicals as relevant.

The purpose of these site access and housekeeping measures is to avoid unauthorised and light and waste related impacts upon MNES species which may potentially occur in areas adjoining the Development footprint. These measures are standard construction industry practice and are predicted to be effective in achieving the intended environmental outcomes of avoiding unauthorised and light and waste related impacts to MNES.

The performance and completion criteria that will be used to monitor the effectiveness of these site access and housekeeping management measures will include:

- Site access signage in place
- Absence of firearms, traps, nests and pests
- Hazardous materials being appropriately handled
- Appropriate emergency spill response equipment on site
- Absence of waste left at the site.

The effectiveness of these site access and housekeeping measures will be monitored via visual inspections at least quarterly during the operation of the solar farm and reported at least annually.

8.2.2.7 Solar panel cleaning

Natural rainfall is typically adequate to keep the solar panels clean however, washing down the solar panels may be required to maintain performance in times of low rainfall. Water for this purpose will be trucked in from off-site and stored in an on-site storage tank for this purpose.

8.2.2.8 Training and awareness measures

The Project Operations Managers (Arrow CSG and Third Party Contractor) will ensure that employees and contractors conducting operational activities on site are made aware of any site-specific flora and fauna requirements relevant to their activities through internal approvals, prestart meetings, the site-specific OEMP, site-specific tool-box talks, inductions or training programs.

Intentional disturbance of fauna will be prohibited (unless authorised under approvals or permits and conducted by a suitably qualified and experienced person).

Training and inductions will cover:

- Environmental obligations responsibilities under the EPBC Act Controlled Action conditions of approval.
- Environmental obligations responsibilities under the *Environmental Protection Act 1994* (Qld), *Environmental Protection Regulation 2008* (Qld) and the Environmental Authority.
- Requirements of this EMP and other project management plans and procedures
- Environmental hazards and control measures
- Emergency, incident and spill response procedures and incident notification procedures including duty to report environmental incidents.
- Weed management and hygiene procedures.
- Water and waste management obligations.
- Fire prevention.
- Interactions with flora and fauna.

Records of training and inductions will be maintained to demonstrate achievement of competence. Training and induction material will be reviewed following change, incident investigations and hazard studies.

The purpose of this training is to avoid accidental and unnecessary disturbance of individual animals including potentially present MNES species during the operational phase. Such training is industry best-practice and is predicted to be effective in assisting in achieving the intended environmental outcome of minimising unnecessary wildlife disturbance.

The performance and completion criteria that will be used to monitor these measures will include training records for all relevant operational site personnel (as evidenced by training and/or induction records, pre-start and tool-box meeting minutes and attendance records)

The effectiveness of these site access and housekeeping measures will be monitored via visual inspections at least quarterly during the operation of the solar farm and reported at least annually.

8.2.3 Decommissioning Phase

Decommissioning will involve removal of site infrastructure and final rehabilitation of the site.

The Project Decommissioning Managers (Arrow CSG and Third Party Contractor) will ensure that a Decommissioning Environmental Management Plan (DEMP) is developed prior to the commencement of decommissioning specifying the mitigation measures that will be applied during that phase.

The key mitigation measures that will be applied during decommissioning include those detailed previously for the Construction and/or Operational Phases in:

- **Section 8.2.1.4** Weed and pest management
- **Section 8.2.1.5** Fire management measures

- **Section 8.2.1.6** Soil and particle/dust management measures
- **Section 8.2.1.7** Erosion and sediment control and stormwater management measures
- **Section 8.2.1.8** Site access and housekeeping measures
- **Section 8.2.1.9** Training and awareness measures
- **Section 8.2.4** Site Rehabilitation.

8.2.4 Site Rehabilitation

The Project Managers (Arrow CSG and Third Party Contractors) will ensure that rehabilitation commences during the construction phase and continues in the operational phase of the Project. Final rehabilitation will be completed following Project decommissioning.

All rehabilitation will be undertaken in accordance with Arrow Energy's Land Rehabilitation Procedure (ORG-ARW-HSM-PRO-00073, Arrow Energy 2020) which has been developed to ensure that disturbed areas are appropriately managed to comply with regulatory requirements, minimise risk of environmental harm and ensure an appropriate land use can be re-established at the end of life of the infrastructure/activity for which land disturbance was required. Dependent on future activities, disturbed areas will be stabilised or rehabilitated to meet regulatory obligations and landholder expectations.

Site rehabilitation will also be in accordance with:

- Arrow Energy's Land Rehabilitation Plan.
- Arrow Energy's Rehabilitation Monitoring Assessment Form.
- A site-specific Construction Rehabilitation Plan (to be developed in cooperation with the construction contractor).
- A site-specific Decommissioning Rehabilitation Plan (to be developed closer to the time of decommissioning).

The Project Managers (Arrow CSG and Third Party Contractors) will ensure that the following site rehabilitation measures are implemented for the Project:

- A site-specific Construction Rehabilitation Plan for all areas not required for ongoing operations. This plan will be developed prior to the commencement of construction addressing ground preparation requirements, natural and constructed drainage patterns, soil erodibility, contamination, slope steepness and length, vegetation cover, land use and landowner requirements. It will include performance and completion indicators, trigger values, corrective actions and an inspection/monitoring schedule.
- Cleared vegetation will be placed at the designated location for re-use during site rehabilitation. If woody vegetation is being cleared by mechanical means, stumps and roots will be grubbed and stockpiled.
- Any vegetation not specified to be stockpiled or retained will be mulched. Mulched material will be reused on site for erosion control or sediment control.
- The depth of mulch and method of application may impact its effectiveness for erosion and sediment control and vegetation re-establishment. The flow chart in Appendix I of the Arrow Energy – Land Disturbance Guideline (**Appendix J**) will be referred to for guidance on appropriate mulching methods, application rates and application methods for low-risk sites. Generally, depths of mulch between 25 – 50mm are appropriate for areas where it is being utilised for erosion control or as a mulch berm/bund for sediment control. A depth of 10 – 25mm is more appropriate where application is for rehabilitation purposes and vegetation re-establishment is desired.
- The cleared areas and stockpiles will be progressively rehabilitated through revegetation and/or mulching.
- Areas will be cleared progressively and rehabilitation implemented as soon as practicable following construction and decommissioning activities.
- Cleared timber will never be burnt.
- Woody debris, logs and rocks will be retained for use in rehabilitation.

- During rehabilitation works, care will be taken when moving stockpiled logs and vegetation to avoid fauna mortality.
- Where required, excavations will be backfilled and rehabilitated. Backfilling will be conducted in a manner that will promote successful rehabilitation, including capping of exposed subsoil with topsoil and replacement of the land surface to preconstruction levels to reduce trench subsidence and concentration of water flow.
- Gravel sheeting will be applied to internal access tracks, substations, and battery areas, while the rest of the site will retain its grass cover
- Re-vegetation of soil beneath solar panels with native or naturalised perennial species will be undertaken to stabilise the land, reduce peak stormwater flows and reduce sediment discharge via stormwater runoff. The solar panels will be elevated above the ground, ensuring they do not hinder establishing ground cover
- Regular monitoring of rehabilitation success will be carried out throughout the construction and operational phases until relevant rehabilitation completion criteria are met
- Monitoring of the rehabilitated areas will be undertaken to identify whether the general objectives of the rehabilitation strategy are being met, and whether a sustainable and stable landform has been achieved. Monitoring will be conducted by suitably skilled and qualified persons at representative locations. Annual reviews of monitoring data will be conducted during operations, and post closure, to assess trends and performance
- Where rehabilitation data is found to be trending away from, and prior to, non-achievement of rehabilitation completion criteria, an investigation into root causes will be undertaken within 3 months including a review of the suitability of rehabilitation methods being applied
- A site-specific Decommissioning/Final Rehabilitation Plan will be developed prior to Project decommissioning and implemented. It will include performance and completion indicators, trigger values, corrective actions, an inspection/monitoring schedule and maintenance of rehabilitated areas until final rehabilitation completion criteria are met. It will include performance and completion indicators, trigger values, corrective actions, an inspection/monitoring schedule. and maintenance.
- After decommissioning, rehabilitation areas will be inspected for regrowth similar to the surrounding environment or as otherwise agreed with the landholder. A suitable vegetation cover will be re-established to enable natural vegetation progression and minimal weed invasion. Final ground conditions will be rehabilitated to a state that is conducive to support further natural regeneration at project closure.
- Rehabilitation timeframes will be compliant with applicable Environmental Authority conditions and consider any landholder requirements/expectations
- Maintenance of rehabilitated areas will continue until final rehabilitation completion criteria are met.
- A final rehabilitation report, including a contaminated land assessment, landowner commitments and agreements, and rehabilitation status, will be prepared and submitted to the appropriate authorities for approval where required.

The purpose of these rehabilitation measures is to ensure no unplanned impacts occur to MNES as a result of construction activities and to ensure, after decommissioning that the area is returned to sustainable and stable landform and pre-disturbed condition (or better) as agreed with the landholder and as required by DETSI in order to grant progressive rehabilitation certification and Environmental Authority surrender (for the broader SGP North development). These rehabilitation measures are widely recognised as being effective good practice for achieving the intended environmental outcome of minimising long-term impacts to MNES.

8.2.5 Guidelines and statutory documents relevant to mitigation measures

Table 8.2: Consistency of proposed mitigation measures with statutory documents

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
Corben's long-eared bat	• Advice dated October 2015 • Protect known and potential habitat of key populations from habitat loss and fragmentation	• Required – included on the 'commenced' list • Recovery objectives are to increase understanding of basic ecology and to clarify distribution and abundance	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • FSC to search for Corben's long-eared bats within hollow bearing trees, peeling/ decorticating bark and splits in tree trunks prior to all clearing and habitat disturbance • If Corben's long-eared bat is unexpectedly found anywhere in the proposed Development footprint, clearing of all potential habitat trees will be undertaken one day after clearing of non-habitat vegetation • Any unexpected find will result in: - an immediate stop to work within 50 m - notification to NEPA within 48 hours - a new impact assessment being undertaken - salvage and relocation of all potentially suitable tree hollows - FSC coordinated relocation of any occupied roosts (as modified from Nottidge 2012 and detailed in **Table 8.1**) • Implement fencing to minimise risk of injury and/or fauna getting caught in fencing • Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
				• pest animals which may then impact Corben's long-eared bat • During construction, directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation and attraction of nocturnal fauna and minimise the risk of impacts
Koala	• Advice dated April 2012 • Manage habitat loss and fragmentation, vehicle strike, disease and predation by dogs	• National Recovery Plan • State-based recovery plans	• Multiple National and State-based plans	• Minimise the Development footprint and vegetation clearing • Ensure construction activities do not extend beyond the work site boundaries • Implement fencing to minimise risk of injury and/or fauna getting caught in fencing • Implement speed limits on project-controlled roads to reduce the potential for vehicle collisions with wildlife • Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the koala • When clearing is conducted it will be carried out in such a way that koala habitat disruption is minimised and injury and/or mortality to koalas is minimised. **Section 8.2.1.2** details the specific clearing methods • Trenches and excavations inspected as per APGA Code of Environmental Practice (APGA 2022) • During construction, directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
				• and attraction of nocturnal fauna and minimise the risk of impacts
South-eastern glossy black-cockatoo	• Advice dated August 2022. • Major threats include habitat loss from land clearing and bushfires (in particular the 2019–2020 fires), fragmentation, and reduced availability of she-oak food sources. • The species is highly dependent on mature she-oak trees and large eucalypts for nesting. (Glossy Black Conservancy 2022, 2022)	• Recovery plan required	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • Fire management will consider regeneration or protection of foraging trees • FSC to search buloke trees within regrowth RE 11.5.1 for south-eastern glossy black-cockatoo • If south-eastern glossy black-cockatoo is found foraging within the proposed Development footprint the FSC will check that any individuals self-relocate prior to vegetation clearing or habitat disturbance
Squatter pigeon	• Advice dated October 2015 • Threats identified include overgrazing, vegetation clearing, introduced weeds, inappropriate burning and predation by feral cats and foxes.	• Not required – see Conservation Advice	• Threat abatement plan for predation by feral cats 2024 • Threat abatement plan for competition and land degradation by rabbits 2016 • Threat abatement plan for predation by the European red fox 2008	• Minimise the Development footprint and vegetation clearing • Where practical, retain native grassland and vegetation • FSC to search for squatter pigeon through 'flush surveys' on foot across the site • If squatter pigeon is unexpectedly found anywhere in the proposed Development footprint, the FSC will check that any individuals self-relocate prior to vegetation clearing or habitat disturbance • Any unexpected nest find will result in:

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
				- an immediate stop to work within 50 m - notification to NEPA within 48 hours - delay of works until eggs, chicks fledge or, if this is not possible relocation of the nest in accordance with the species-specific measures detailed in **Table 8.1** • Development and implementation of a Project- specific ESCP and WPMP prior to the commencement of construction • Where applicable, rehabilitation will aim to restore native grass species and shrub cover. The ESCP and WPMP will assist with ground rehabilitation • Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the squatter pigeon
Diamond firetail	• Advice dated March 2023 • Key threats include habitat loss due to agricultural clearing, degradation and/or replacement of native grasslands, overgrazing, and predation by invasive species	• Recovery plan required	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • Where practical, retain native grassland and vegetation • FSC to search for diamond firetail and their nests in all low and ground layer vegetation and shrubs prior to all clearing and habitat disturbance • If diamond firetail is unexpectedly found anywhere in the proposed Development footprint, the FSC will check that any individuals self-relocate prior to vegetation clearing or habitat disturbance

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents

				• Any unexpected nest find will result in:
				  - an immediate stop to work within 50 m
				  - notification to NEPA within 48 hours
				  - delay of works until eggs, chicks fledge or, if this is not possible relocation of the nest in accordance with the species-specific measures detailed in **Table 8.1**
				  - Development and implementation of a Project- specific ESCP and WPMP prior to the commencement of construction
				• Where applicable, rehabilitation will aim to restore native grass species and shrub cover. The WPMP and the erosion and sediment control plan will assist with ground rehabilitation
				• Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the diamond firetail

Dunmall's snake	• Advice dated April 2014 • Legacy of past broad scale land clearing for grazing and agriculture • Manage disruptions to water flow and modifications to wetlands; investigate conservation arrangements	• Not required – see Conservation Advice	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • Ensure construction activities do not extend beyond the work site boundaries • FSC to search for Dunmall's snake under fallen timber and within any suitably sized soil cracks and other cavities and termite mounds

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents

				• Trenches and excavations inspected as per APGA Code of Environmental Practice (APGA 2022). Any unexpected find will result in:
				  - an immediate stop to work within 50 m
				  - notification to NEPA within 48 hours
				  - a new impact assessment being undertaken
				• ESCP and WPMP will be implemented to reduce indirect sedimentation impacts and facilitate ground rehabilitation
				• Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the Dunmall's snake
				• During construction, directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation and attraction of nocturnal fauna and minimise the risk of impacts

identifies how the proposed mitigation measures are supported and informed by species guidelines and statutory documents.

Table 8.2: Consistency of proposed mitigation measures with statutory documents

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
Corben's long-eared bat	• Advice dated October 2015 • Protect known and potential habitat of key populations from habitat loss and fragmentation	• Required – included on the 'commenced' list • Recovery objectives are to increase understanding of basic ecology and to clarify distribution and abundance	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • FSC to search for Corben's long-eared bats within hollow bearing trees, peeling/ decorticating bark and splits in tree trunks prior to all clearing and habitat disturbance • If Corben's long-eared bat is unexpectedly found anywhere in the proposed Development footprint, clearing of all potential habitat trees will be undertaken one day after clearing of non-habitat vegetation • Any unexpected find will result in: - an immediate stop to work within 50 m - notification to NEPA within 48 hours - a new impact assessment being undertaken - salvage and relocation of all potentially suitable tree hollows - FSC coordinated relocation of any occupied roosts (as modified from Nottidge 2012 and detailed in **Table 8.1**) • Implement fencing to minimise risk of injury and/or fauna getting caught in fencing • Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
				• pest animals which may then impact Corben's long-eared bat • During construction, directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation and attraction of nocturnal fauna and minimise the risk of impacts
Koala	• Advice dated April 2012 • Manage habitat loss and fragmentation, vehicle strike, disease and predation by dogs	• National Recovery Plan • State-based recovery plans	• Multiple National and State-based plans	• Minimise the Development footprint and vegetation clearing • Ensure construction activities do not extend beyond the work site boundaries • Implement fencing to minimise risk of injury and/or fauna getting caught in fencing • Implement speed limits on project-controlled roads to reduce the potential for vehicle collisions with wildlife • Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the koala • When clearing is conducted it will be carried out in such a way that koala habitat disruption is minimised and injury and/or mortality to koalas is minimised. **Section 8.2.1.2** details the specific clearing methods • Trenches and excavations inspected as per APGA Code of Environmental Practice (APGA 2022) • During construction, directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
				• and attraction of nocturnal fauna and minimise the risk of impacts
South-eastern glossy black-cockatoo	• Advice dated August 2022. • Major threats include habitat loss from land clearing and bushfires (in particular the 2019–2020 fires), fragmentation, and reduced availability of she-oak food sources. • The species is highly dependent on mature she-oak trees and large eucalypts for nesting. (Glossy Black Conservancy 2022, 2022)	• Recovery plan required	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • Fire management will consider regeneration or protection of foraging trees • FSC to search buloke trees within regrowth RE 11.5.1 for south-eastern glossy black-cockatoo • If south-eastern glossy black-cockatoo is found foraging within the proposed Development footprint the FSC will check that any individuals self-relocate prior to vegetation clearing or habitat disturbance
Squatter pigeon	• Advice dated October 2015 • Threats identified include overgrazing, vegetation clearing, introduced weeds, inappropriate burning and predation by feral cats and foxes.	• Not required – see Conservation Advice	• Threat abatement plan for predation by feral cats 2024 • Threat abatement plan for competition and land degradation by rabbits 2016 • Threat abatement plan for predation by the European red fox 2008	• Minimise the Development footprint and vegetation clearing • Where practical, retain native grassland and vegetation • FSC to search for squatter pigeon through 'flush surveys' on foot across the site • If squatter pigeon is unexpectedly found anywhere in the proposed Development footprint, the FSC will check that any individuals self-relocate prior to vegetation clearing or habitat disturbance • Any unexpected nest find will result in:

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents
				- an immediate stop to work within 50 m - notification to NEPA within 48 hours - delay of works until eggs, chicks fledge or, if this is not possible relocation of the nest in accordance with the species-specific measures detailed in **Table 8.1** • Development and implementation of a Project- specific ESCP and WPMP prior to the commencement of construction • Where applicable, rehabilitation will aim to restore native grass species and shrub cover. The ESCP and WPMP will assist with ground rehabilitation • Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the squatter pigeon
Diamond firetail	• Advice dated March 2023 • Key threats include habitat loss due to agricultural clearing, degradation and/or replacement of native grasslands, overgrazing, and predation by invasive species	• Recovery plan required	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • Where practical, retain native grassland and vegetation • FSC to search for diamond firetail and their nests in all low and ground layer vegetation and shrubs prior to all clearing and habitat disturbance • If diamond firetail is unexpectedly found anywhere in the proposed Development footprint, the FSC will check that any individuals self-relocate prior to vegetation clearing or habitat disturbance

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents

				• Any unexpected nest find will result in:
				  - an immediate stop to work within 50 m
				  - notification to NEPA within 48 hours
				  - delay of works until eggs, chicks fledge or, if this is not possible relocation of the nest in accordance with the species-specific measures detailed in **Table 8.1**
				  - Development and implementation of a Project- specific ESCP and WPMP prior to the commencement of construction
				• Where applicable, rehabilitation will aim to restore native grass species and shrub cover. The WPMP and the erosion and sediment control plan will assist with ground rehabilitation
				• Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the diamond firetail

Dunmall's snake	• Advice dated April 2014 • Legacy of past broad scale land clearing for grazing and agriculture • Manage disruptions to water flow and modifications to wetlands; investigate conservation arrangements	• Not required – see Conservation Advice	• No Plan has been identified as being relevant for this species • Key threats are provided in the conservation advice	• Minimise the Development footprint and vegetation clearing • Ensure construction activities do not extend beyond the work site boundaries • FSC to search for Dunmall's snake under fallen timber and within any suitably sized soil cracks and other cavities and termite mounds

MNES	Conservation Advice	Recovery Plan	Threat Abatement Plan	Proposed mitigation measures consistent with statutory documents

				• Trenches and excavations inspected as per APGA Code of Environmental Practice (APGA 2022). Any unexpected find will result in:
				  - an immediate stop to work within 50 m
				  - notification to NEPA within 48 hours
				  - a new impact assessment being undertaken
				• ESCP and WPMP will be implemented to reduce indirect sedimentation impacts and facilitate ground rehabilitation
				• Food, waste and other project activities will be managed to prevent or minimise the potential for these to transport or attract pest animals which may then impact the Dunmall's snake
				• During construction, directional, shielded lighting and limiting night works will be preferentially used to avoid disorientation and attraction of nocturnal fauna and minimise the risk of impacts

8.3 Monitoring

Monitoring will be undertaken to determine the success of the mitigation measures identified within **Section 8.2** in achieving the stated environmental outcomes.

Monitoring will be conducted by suitably skilled and qualified persons at representative locations. Annual reviews of monitoring data will be conducted by Arrow CSG during construction, operations, and decommissioning to assess trends and performance. Corrective actions will be undertaken based on the outcomes of incident investigations, audits, monitoring results and advice given by the relevant regulatory authority.

Table 8.3 sets out the monitoring program which will be undertaken which relate specifically to EPBC Act species and communities. The table describes the methods and proposed timing as well as identifying responsible parties, reporting formats, trigger values for corrective actions to be initiated and describes adaptive management responses and / or how they will be determined.

Note that Geocortex and the Arrow Sharepoint database, referred to in **Table 8.3** is a web-based collaborative platform that integrates with Microsoft Office and allows multiple users to enter and view project data.

Table 8.3: Monitoring program components for EPBC Act species

Monitoring activities	Monitoring methods/commitments	Timing	Responsible party	Reporting format	Corrective action trigger values	Adaptive management responses
Review of compliance with approval conditions and mitigation measure commitments	The coordinates and total area of cleared vegetation will be recorded and tracked at least monthly against the approved maximum disturbance limit and used for annual compliance reporting. All confirmed cases of noncompliance (and remedial actions) will be reported on the Arrow website. Monitoring and inspection of avoidance, mitigation and management measures will be implemented to ensure the impacts and residual risks are minimised throughout the lifetime of the Project.	Clearing tracked & monitored at least monthly. Reporting to NEPA annually except if non-compliance occurs – self report as per conditions.	Arrow CSG	Annual Compliance Report	Non-compliance	As determined by Annual Compliance Reports
Pre-clearance surveys	Surveys to identify any additional areas that need to be avoided and quantify areas of EPBC Act species habitat which are unavoidable and will be cleared. As a minimum, these will include: • vegetation mapping at a scale suitable for site-specific planning. • identification of habitats for MNES species. Quantification will be based on field recording of GPS coordinates of the	Pre-clearance surveys have already been completed. Demarcation of clearing boundaries will be implemented and verified prior to	Supervised by a suitably qualified person	Annual Pre - clearance Survey Report provided on the Arrow website	Clearances proposed outside of the approved Disturbance footprint	Amendment of proposed clearance / disturbance areas so they are within the approved Disturbance footprint.

Monitoring activities	Monitoring methods/commitments	Timing	Responsible party	Reporting format	Corrective action trigger values	Adaptive management responses
	boundary of the habitat within proposed clearing boundaries. These surveys will also be used to ensure that the limits of the area to be cleared are clearly marked on the ground (i.e. high visibility flagging tape, hazard netting or similar) in accordance with the construction limits shown on construction drawings.	construction commencing.				
Monitoring for unauthorised clearing	Audits/checks will be undertaken during and after clearing activities to ensure no unauthorised encroachment has occurred.	In the lead up to clearing and at least daily during clearing and at the completion of clearing	Construction contractor (environmental representative)	The Construction Contractor is required to report any unauthorised clearing to the Arrow Environment Manager within 24hrs of becoming aware.	Unauthorised clearing.	Review of CEMP with Construction Contractor and amendment as required.
FSC monitoring	A FSC will be present during vegetation clearing and habitat disturbance. The number of FSCs on site at the time of clearing will depend on the number of machines being used at any given time.	At all times during clearing	FSC	All human/wildlife interactions or incidents involving EVNT Act fauna species will be reported to Arrow via the Fauna Incident Notification Form (FIN) within 24 hours, and will be	Injury to or mortality of individuals of EPBC Act species.	Notification to NEPA within 48 hours. An investigation into possible root causes would be undertaken as well as a review of relevant mitigation measures and the CEMP and refinement

Monitoring activities	Monitoring methods/commitments	Timing	Responsible party	Reporting format	Corrective action trigger values	Adaptive management responses
				detailed in the FSC report to be provided to Arrow at the completion of habitat clearing activities (or weekly if clearing activities are ongoing). The FSC report will also detail all human/wildlife interactions or incidents with any species irrespective of their conservation status. Interactions are defined as observations of the species on the work site, captures, removals and relocations. Incidents are defined as any injury or death.		of these where necessary.
	Key Koala trees will be identified and visually inspected prior to clearing to ensure that they are free of Koalas.	Prior to vegetation clearing and daily during	FSC	Koala presence recorded within Geocortex and the	Koalas located	Implementation of measures detailed in **Section 8.2.1.2**.

Monitoring activities	Monitoring methods/commitments	Timing	Responsible party	Reporting format	Corrective action trigger values	Adaptive management responses
		clearing works.		Arrow Sharepoint database. Spotter-catcher daily activity records		
	Trees will be assessed for potential nesting hollows prior to felling.	Prior to clearing.	FSC	Nesting hollows recorded within Geocortex and the Arrow Sharepoint database. Spotter-catcher daily activity records.	Nesting hollows identified	Trees will be felled in the presence of a FSC and rolled so that the hollows are facing upwards, allowing fauna to escape.
	Data collection, particularly of MNES species identified during FSC surveys, during trench / excavation checking or in other related activities, will be ongoing until vegetation clearing and / or habitat disturbance is complete. FSC surveys will include searches for EVNT species as detailed in **Section 8.2.1.1**.	During FSC surveys	FSC	Recorded within Geocortex and the Arrow Sharepoint database.	Detection of any MNES.	Implementation of the unexpected find measures detailed in **Table 8.1**.
Inspection for fauna entrapment	Trenches and excavations will be inspected and monitored as per the APGA Code of Environmental Practice (APGA 2022) and will be checked within two hours of sunrise and trapped fauna released.	At least daily whenever trenches / excavations are open.	FSC	Fauna rescue records	Injury to or mortality of individuals of EPBC Act species.	Notification to NEPA within 48 hours. An investigation into possible root causes would be undertaken as well as a review of

Monitoring activities	Monitoring methods/commitments	Timing	Responsible party	Reporting format	Corrective action trigger values	Adaptive management responses
	Additional inspections will be undertaken after rainfall events.					relevant mitigation measures and the CEMP and refinement of these where necessary. Increased frequency of inspections.
Analysis of EPBC Act fauna species mortality records	EVNT fauna mortality (e.g. road kill) record database will be maintained and analysed.	Incident based throughout the life of the project	Arrow CSG	Recorded within Geocortex and the Arrow Sharepoint database and reported in Annual Compliance Report.	Any EVNT fauna Mortalities caused by Project activities	Notification to NEPA within 48 hours. Depending on the cause of mortality responses could include installation of warning signs or fencing and reduction in speed limits in specific locations.
Weed and pest monitoring	Regular inspections for pest flora and evidence of pest fauna will be undertaken within Project disturbed areas.	At least annually and reported at least annually	Arrow	Annual EPBC Monitoring Report	New weeds recorded. Higher weed cover within disturbed areas relative to adjoining areas.	Additional weed management measures at problem locations. Review of Project Weed and Pest Management Plan.
Rehabilitation monitoring	Disturbed areas will be regularly inspected until ground stabilisation is achieved.	Postconstruction, at least quarterly and	Supervised by a suitably qualified person	Annual EPBC Monitoring Report	Rehabilitation data trending away from, and prior to,	An investigation into root causes would be undertaken within 3 months of the

Monitoring activities	Monitoring methods/commitments	Timing	Responsible party	Reporting format	Corrective action trigger values	Adaptive management responses
	After decommissioning, rehabilitation areas will be inspected for regrowth similar to the surrounding environment or as required for the final landuse as agreed with the landholder. Regular checks of rehabilitation success will be carried out. A rehabilitation management plan for decommissioning will be developed and implemented which includes inspections and maintenance of rehabilitated areas until rehabilitation sign off criteria are met. Surveys/inspections of the rehabilitated areas will be undertaken to identify whether the general objectives of the rehabilitation strategy are being met, and whether a sustainable and stable landform has been achieved. Annual reviews of surveys/inspection data will be conducted during operations, and post closure, to assess trends and performance.	reported annually			nonachievement of rehabilitation completion criteria	corrective action trigger including a review of the suitability of rehabilitation methods being applied.

9. Significant Impact Assessments

As detailed in **Section 6**, the LoO assessment and subsequent analysis of population and habitat characteristics of likely and possible species found that there is potential for the Project to impact six MNES species. These are:

- Corben's long-eared bat (threatened - vulnerable)
- Greater glider (threatened - endangered)
- Koala (threatened - endangered)
- South-eastern glossy black-cockatoo (threatened - vulnerable)
- Squatter pigeon (southern) (threatened – vulnerable)
- Diamond firetail (threatened - vulnerable)
- Dunmall's snake (threatened – vulnerable).

Sections 9.1 to **9.7** present the significant residual impact assessments for each of these species.

9.1 Corben's long-eared bat (Vulnerable)

To determine whether the Project will have a significant impact on the Corben's long-eared bat, an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for vulnerable species has been undertaken, the results of which are provided in **Table 9.1**.

Table 9.1: Assessment of significant residual impacts for the Vulnerable Corben's long-eared bat

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of an important population?	**Unlikely** Several records of the Corben's long-eared bat have been identified in the region surrounding the Development footprint (including Barakula State Forest and Condamine State Forest), suggesting that a local population is likely to occur. The nearest record is approximately 2 km to the south-east (Arrow Energy 2013). Important populations for Corben's long-eared bat have not been explicitly defined in the conservation advice (TSSC 2015a). Within the Murray-Darling Basin this species has a patchy distribution which extends from the Queensland-New South Wales border north to the Blackdown Tableland National Park. The Project appears to be located well within this known distribution, and far enough away from its distributional limits to not be considered an 'important population' on the basis of the species' range. Most species of *Nyctophilus* are thought to be sedentary and the slow, manoeuvrable flight that characterises this genus is not considered conducive to long distance flights (Lumsden, 1994). Foraging is generally undertaken within several kilometres of their roosting site (Lumsden *et al,* 2002). As such, the Development footprint may be utilised by a local population of this species however, due to the widespread distribution of similar habitat across the region, any local population is considered unlikely to be a key source population or necessary for maintaining genetic diversity. As such, any population of Corben's long-eared bat in this location is not considered an important population. Whilst the Project will require the removal of 30.1 ha of suitable foraging habitat (which includes 19.8 ha of suitable roosting habitat), any Corben's long-eared bats in the area are not likely to be part of an important population. It is therefore considered unlikely that the construction and ongoing operation of the Project will lead to a long-term decrease in the size of an important population.

Is there a real chance or possibility that the Project will reduce the area of occupancy of an important population?	**Unlikely** The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA 2024). While the conservation advice for this species does not include an estimated area of occupancy, using the ALA tool, this has been estimated to be approximately 1,816 km^2 (ALA 2025). Whilst the construction of the Project will require the removal of 30.1 ha of suitable foraging habitat (which includes 19.8 ha of suitable roosting habitat) for this species, there is an abundance of suitable contiguous habitat for this species in the region surrounding the Project. Additionally, as detailed in the preceding response, any local population is not considered to represent an important population. It is therefore considered unlikely that the construction and ongoing operation of the Project will reduce the area of occupancy of an important population.
Is there a real chance or possibility that the Project will fragment an existing important population into two or more populations?	**Unlikely** The Corben's long-eared bat, like most species in the *Nyctophilus* genus, are slow but highly manoeuvrable flyers that are believed to be unlikely to make long distance flights (TSSC 2015a). This species typically forages within a couple of kilometres of their roosting sites. Whilst the Project currently sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest), satellite imagery indicates that the Project has previously been subjected to historical clearing dating back to at least 1952 (QI 2025). Whilst much of this vegetation has had an opportunity to recover, the surrounding area remains fragmentated by roads and other utility corridors such as high-voltage powerlines and CSG infrastructure. Whilst the construction of the Project will require the removal of 30.1 ha of suitable foraging habitat (which includes 19.8 ha of suitable roosting habitat), the limited extent and condensed shape of the project footprint relative to adjoining habitat areas is unlikely to significantly restrict the ability of any local population to traverse the landscape or affect dispersal capabilities of this species. Furthermore, the removal of this habitat is unlikely to significantly change the level of fragmentation already present in the wider and surrounding landscape. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing important population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Possible** The conservation advice for this species does not provide a definition for 'habitat critical to the survival of the species', as such it is relevant to consider the broad definition as an area that is necessary: • for activities such as foraging, roosting, breeding or dispersal • for the long-term maintenance of the species • to maintain genetic diversity and long-term evolutionary development • for the reintroduction of populations or recovery of the species. As there is still uncertainty in the scientific community around what areas are likely to be important for this species because they can utilise such a wide range of vegetated woodlands, the Project has adopted a conservative definition of 'habitat critical to the survival of the species' which includes all mapped habitat for this species. As such,

	mapped roosting and foraging habitat within the Development footprint is considered to be 'habitat critical to the survival of the species'. As the Project will require the removal of 30.1ha of suitable foraging habitat (which includes 19.8 ha of suitable roosting habitat), there is a risk that the construction of the Project could adversely affect habitat critical to the survival of the Corben's long-eared bat.
Is there a real chance or possibility that the Project will disrupt the breeding cycle of an important population?	**Unlikely** Corben's long-eared bat roosts mainly in tree hollows however they are also known to roost under bark or in fissures (TCCS, 2015),. Therefore, suitable roosting habitat is in areas of regrowth RE 11.5.1 of which construction of the Project will require the removal of 19.8 ha. However, the abundance of extant similar habitat in the surrounding landscape suggests that this impact is unlikely to significantly disrupt the breeding cycle of any population. Furthermore, for the reasons described in the above responses, the local population is unlikely to represent an important population. It is therefore considered unlikely that the construction and ongoing operation of the Project will disrupt the breeding cycle of an important population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?	**Unlikely** The region surrounding the Development footprint is already fragmentated by roads and other utility corridors such as high-voltage powerlines and CSG infrastructure, and the construction of the Project is unlikely to significantly alter existing fragmentation characteristics of the local landscape. Habitat assessments undertaken across the Development footprint have identified that there are no notable tree hollows and most of the vegetation mapped within the Development footprint is either regrowth or non-remnant. While the construction of the Project will require the removal of approximately 30.1 ha of suitable foraging habitat (which includes 19.8 ha of suitable roosting habitat), this impact is not considered to represent a substantial loss of habitat in the context of the surrounding landscape. The cleared area will represent a fraction of the available habitat for this species in the surrounding region. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size), all of which likely provides similar habitat values for this species considering its regional distribution. It is therefore considered unlikely that the construction and ongoing operation of the Project will modify, destroy, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Is there a real chance or possibility that the Project will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?	**Unlikely** Whilst ecological surveys undertaken have confirmed the presence of various weed and pests within the Development footprint, invasive species are not currently listed as a key threatening process for Corben's long-eared bat. It has been noted that impacts of predation by feral animals needs to be assessed for this species (TSSC 2015a). Regardless of this, Arrow CSG will develop and implement a WPMP and/or Weed and Pest Management Section within the CEMP and OEMP. This plan/section will ensure that vehicles and other equipment entering the Project area have been sufficiently cleaned and are held to the appropriate Queensland Biosecurity standards. This WPMP will also include management and mitigation measures to ensure that the invasive species already present within the Development footprint are managed

	appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact the Corben's long-eared bat.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** There are currently no diseases listed as threatening processes for the Corben's long-eared bat (TSSC 2015a). It is considered unlikely that the construction and ongoing operation of the Project will introduce any such diseases into locally occurring populations.
Is there a real chance or possibility that the Project will interfere substantially with the recovery of the species?	**Unlikely** There are numerous conservation and management actions listed for the Corben's long-eared bat within the conservation advice (TSSC 2015a), however some of these relate to known research priorities for this species suggesting a level of uncertainty around what management actions would be most effective. Conservation actions that could be relevant to the Project include: • *Protect known and potential habitat for key populations, including within conservation reserves, from habitat loss and fragmentation* • *Retain hollow-bearing trees and provide for hollow tree recruitment where possible* • *Implement control programmes for feral pest species.* The region surrounding the Development footprint is already fragmentated by roads and other utility corridors such as high-voltage powerlines and CSG infrastructure, and the construction of the Project is unlikely to significantly contribute to this existing fragmentation. Habitat assessments undertaken across the Development footprint have identified that there are no notable tree hollows and most of the vegetation mapped within the Development footprint is either regrowth or non-remnant. While the construction of the Project will require the removal of approximately 30.1 ha of suitable foraging habitat (which includes approximately 19.8 ha of suitable roosting habitat), this impact is not considered to represent a substantial loss of habitat in the context of the surrounding landscape. Furthermore, Arrow CSG will develop and implement a WPMP to help manage feral pest species present within the Project area. It is therefore considered unlikely that the Project will substantially interfere with the recovery of this species.
It is considered **possible** that the Project will have a significant impact on the Corben's long-eared bat.	

9.2 Greater glider (Endangered)

To determine whether the Project will have a significant impact on the greater glider, an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for endangered species has been undertaken, the results of which are provided in **Table 9.2**.

Table 9.2: Assessment of significant residual impacts for the Endangered greater glider

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of a population?	**Unlikely** Numerous greater glider records have been recorded in the region surrounding the Development footprint (particularly within Gurulmundi State Forest and Barakula State Forest), suggesting a local population may occur, however no individuals have been observed during consolidated survey efforts across the Development footprint. The nearest record is approximately 8 km to the south-east (Arrow 2017) associated with Dogwood and Punchbowl Creeks. Whilst the Project will require the removal of approximately 19.8 ha of suitable foraging habitat for this species, this habitat contains only limited numbers of regrowth Eucalyptus crebra (one of six tree species identified as dominant or co-dominant in the majority of Queensland greater glider habitat (Eyre, 2022)). The Project site mostly contains sparsely treed non-remnant areas and regrowth eucalypt woodland . The absence of hollows and an average tree diameter at breast height (DBH) of <30 cm means that the area is not suitable as breeding or denning habitat. It is therefore considered unlikely that the construction and ongoing operation of the Project will lead to a long-term decrease in the size of a population.
Is there a real chance or possibility that the Project will reduce the area of occupancy of this species?	**Unlikely** The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA 2024). The area of occupancy for the greater glider is approximately 15,316 km^2 (DCCEEW, 2022b). Whilst the construction of the Project will require the removal of 19.8 ha of suitable foraging habitat no local records of this species have been identified. Furthermore, there is an abundance of suitable contiguous habitat for this species in the region surrounding the Development footprint. It is therefore considered unlikely that the construction and ongoing operation of the Project will reduce the area of occupancy of this species.
Is there a real chance or possibility that the Project will fragment an existing population into two or more populations?	**Unlikely** Whilst the Development footprint sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest), satellite imagery indicates that the Development footprint has previously been subjected to historical clearing dating back to at least 1952 (QI 2025). Whilst much of this vegetation has had an opportunity to recover, the surrounding area remains somewhat fragmentated by roads and CSG infrastructure. The greater glider is typically absent from cleared areas and has little dispersal ability to move through cleared areas between patches of fragmentated habitat (DCCEEW, 2022b). Although they have small home ranges, their low reproductive rates and sensitivity to disturbance means they tend to become locally extinct in

	small and fragmentated patches of habitat (Eyre, et al. 2022b). Whilst this species prefers to glide between trees when traversing through habitat, they are also known to come to the ground, although this is not their preferred method of dispersal. Greater gliders typically move through woodland and forest habitat by gliding from tree-to-tree without coming to ground. They are capable of maximum glide angle of between 31 to 40 degrees from horizontal (Taylor & Goldingay 2009), with a glide angle of 40 degrees roughly correlating to a maximum glide distance of 1.2 times the height of the canopy. Therefore, if trees are approximately 30 m high, greater gliders are unlikely to cross clearings greater than 36 m, and if trees are approximately 20 m high, the animals would be unlikely to cross clearings > 26 m. The boundary of the Project is somewhat defined by existing disturbance including a road corridor along the western boundary (approximately 20 m wide) and a CSG easement on the eastern boundary (approximately 70 m wide). Considering the maximum gliding distance of the greater glider, the Project is already somewhat isolated from habitat values to the east and maintains limited connectivity to habitat values to the west. Whilst the construction of the Project will require the removal of 19.8 ha of suitable foraging habitat, this impact is unlikely to affect the connectivity of the surrounding landscape, especially considering the existing levels of fragmentation. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Unlikely** Whilst the lack of mature vegetation and suitable tree hollows indicates that the Project is unlikely to contain any suitable denning habitat for the greater glider, suitable foraging habitat was found to be abundant. As detailed in **Section 6.2.2.2** , an assessment of the Development footprint against the criteria defining 'habitat critical for survival' for the greater glider determined that the marginal/low value habitat in the Development footprint is unlikely to represent 'habitat critical to the survival of the species' and is instead considered as 'potentially suitable foraging and dispersal habitat' based on the presence of preferred feed tree species. Therefore, the removal of 19.8 ha of habitat is not considered significant, particularly when the abundance of extant habitat in the surrounding landscape is considered. It is therefore unlikely that the construction and ongoing operation of the Project will adversely affect habitat critical to the survival of the greater glider.
Is there a real chance or possibility that the Project will disrupt the breeding cycle of a population?	**Unlikely** Greater gliders are known to give birth to a single young from March to June (DCCEEW 2022b). They have a preference to den within large hollows (>10 cm DBH) in large, old trees. Whilst the construction of the Project will require the removal of 19.8 ha of suitable foraging habitat, habitat assessments undertaken across the Project did not identify the presence of any suitable denning habitat (large tree hollows). It is therefore considered unlikely that the construction and ongoing operation of the Project will disrupt the breeding cycle of any greater glider population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of	**Unlikely** The lack of mature vegetation and suitable tree hollows indicates that the Project is unlikely to contain any suitable denning habitat for the greater glider.

habitat to the extent that the species is likely to decline?	Whilst the construction and ongoing operation of the Project will require the removal of 19.8 ha of suitable foraging habitat, these impacts represent a relatively small fraction of the habitat available for this species in the surrounding region. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size), all of which likely provides similar habitat values for this species considering its regional distribution. It is therefore considered unlikely that the construction and ongoing operation of the Project will modify, destroy, isolate or decrease the availability or quality of habitat to the extent that greater glider is likely to decline.
Is there a real chance or possibility that the Project will result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?	**Unlikely** Ecological surveys undertaken across the Project have confirmed the presence of various weed and pest species, including the feral cat (*Felis catus*) which is listed as a threatening process for the greater glider. The occurrence of European foxes, another listed invasive species has not been verified but is possible. Arrow CSG will develop and implement a WPMP which will ensure that vehicles and other equipment entering the Project area have been sufficiently cleaned and are held to the appropriate Queensland Biosecurity standards. This WPMP will also include management and mitigation measures to ensure that the invasive species already present within the Project area are managed appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact the greater glider.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** There are currently no diseases listed as threatening processes for the greater glider. It is considered unlikely that the construction and ongoing operation of the Project will introduce any such diseases to the Project area.
Is there a real chance or possibility that the Project will interfere with the recovery of the species?	**Unlikely** Whilst a recovery plan has not yet been developed for the greater glider, several conservation and management priorities have been outlined for this species (DCCEEW, 2022b), including: • *In the aftermath of bushfires, protect any unburnt habitat (within or adjacent to recently burnt landscapes) in order to support population recovery.* • *Protect and maintain sufficient areas of suitable habitat, including denning and foraging resources and habitat connectivity, to sustain viable subpopulations throughout the species' range.* • *Avoid fragmentation and loss of habitat due to development of new transport corridors. Include consideration of the species in planning processes, and where possible re-locate recreational activities and roads away from habitat.* Vegetation within the Development footprint shows that the site has suffered recent significant fire damage and a review of the Queensland Fire Scar mapping (QG 2025) identified that a large area of vegetation (which includes the Development footprint) was significantly impacted by bushfires in 2022.

	Habitat assessments undertaken across the Project did not identify the presence of any suitable denning habitat (large tree hollows) for this species, and impacts on available foraging habitat are unlikely to contribute to the existing fragmentation already present in the region surrounding the Project. As detailed in **Section 6.2.2.2** , an assessment of the Development footprint against the criteria defining 'habitat critical for survival' for the greater glider determined that the marginal/low value habitat in the Development footprint is unlikely to represent 'habitat critical to the survival of the species' and is instead considered as 'potentially suitable foraging and dispersal habitat' based on the presence of preferred feed tree species. Therefore, the removal of 19.8 ha of habitat is not considered significant, particularly when the abundance of extant habitat in the surrounding landscape is considered, and the Project is unlikely to interfere with the recovery of this species.
It is considered **unlikely** that the Project will have a significant impact on the greater glider.	

9.3 Koala (Endangered)

In February 2022, the koala (combined populations of Queensland, New South Wales, and the Australian Capital Territory) was listed as Endangered under the EPBC Act, being uplisted from its previous status of Vulnerable. According to DCCEEW, this update was due to the impacts of a prolonged drought, followed by the black summer bushfires and the cumulative impacts of disease, urbanisation, and habitat loss over the past 20 years. In conjunction with this status update, the referral guidelines for the koala were also updated (DCCEEW, 2024) to provide proponents with more guidance around what potential impacts are likely to require a referral under the EPBC Act.

In accordance with the referral guidelines for the Endangered koala (DCCEEW, 2024), there are several factors that should be considered before the Significant Impact Guidelines (DOE, 2013) are consulted. An assessment of these factors is included in **Table 9.3**.

Table 9.3: Preliminary Self-Assessment Factors

Factor	Project Response
Consider the scale of the action and its impacts	While consolidated survey efforts across the Development footprint have not detected any locally occurring koala populations, suitable habitat for this species has been identified. The Project will require the removal of approximately 19.8 ha of suitable breeding and foraging habitat, with an additional 10.3 ha of dispersal habitat. When this impact is considered in the context of the broader landscape, this impact is considered to be relatively minor as there is an abundance of suitable habitat in adjoining bushland area (which includes Barakula State Forest).
Consider the intensity of the action and its impacts	The Development footprint is currently being grazed by cattle and is dominated by regrowth vegetation that was significantly impacted by bushfires in 2022 (QG 2025). To facilitate the construction of the Project, the entire Development footprint (30.1 ha) will need to be cleared.
Consider the duration and frequency of the action and its impacts	The solar farm is expected to be in operation for 20 years (estimated from 2027 – 2047), with an option to extend this through refurbishment and replacement of parts.
Consider the environmental context. *E.g. The sensitivity, value, quality and size of the environment. You must also consider the site's connectivity to other*	The Development footprint is currently being grazed by cattle and is dominated by regrowth vegetation that was significantly impacted by bushfires in 2022 (QG 2025). It is situated within a large patch of otherwise contiguous vegetation that also contains Barakula State Forest Whilst no evidence of koalas have been observed within the Development footprint, there are numerous records in the region surrounding the Development

habitats in the broader landscape and its importance in conserving the environment	footprint, the nearest of which being 9 km to the south-east (ALA 1987) with a more contemporary record occurring 26 km to the north-east (ALA 2017). These records along with an abundance of suitable habitat for this species, suggests that a local koala population may utilise habitat values present within the Project.
Consider the nature of the potential impacts that are likely to result from your actions.	The Project will require the removal of approximately 19.8 ha of suitable breeding and foraging habitat, and an additional 10.3 ha of dispersal habitat to facilitate the construction of the solar farm.
Consider whether mitigation measures will avoid or reduce these impacts	As discussed in **Section 8**, Arrow CSG have attempted to avoid, minimise and mitigate impacts to mapped koala habitat during the construction and operation of the Project. Whilst not all impacts are avoidable, impacts to koala habitat will be minimised through these controls.

To determine whether the Project will have a significant impact on the koala, an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for endangered species has been undertaken, the results of which are provided in **Table 9.4.**

Table 9.4: Assessment of significant residual impacts for the Endangered koala

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of a population?	**Possible** Numerous koala records have been recorded in the region surrounding the Development footprint (including Barakula State Forest, Condamine State Forest and in various locations around Wandoan, Miles and Chinchilla), suggesting a local population may occur, however no individuals have been observed during consolidated survey efforts across the Development footprint. The nearest record is approximately 9 km to the south-east (ALA 1987), with a more contemporary record occurring 26 km to the north-east (ALA 2017). The Project will require the removal of approximately 19.8 ha of suitable breeding and foraging habitat for this species in addition to 10.3 ha of suitable dispersal habitat. It is therefore possible that the construction and ongoing operation of the Project could lead to a long-term decrease in the size of a population.
Is there a real chance or possibility that the Project will reduce the area of occupancy of this species?	**Unlikely** The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA, 2024). The area of occupancy for the koala is estimated to be approximately 19,428 km^2 and is believed to be contracting (DAWE, 2022a). Whilst the Project will require the removal of approximately 19.8 ha of suitable breeding and foraging habitat for this species in addition to 10.3 ha of suitable dispersal habitat., there is an abundance of suitable habitat for this species in the region surrounding the Project in which there are no significant barriers to dispersal. It is therefore considered unlikely that the construction and ongoing operation of the Project will reduce the area of occupancy of the koala.
Is there a real chance or possibility that the Project will fragment an existing	**Unlikely** Whilst the Project currently sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest), satellite imagery indicates that the

population into two or more populations?	Project has previously been subjected to historical clearing dating back to at least 1952 (QI 2025). Whilst much of this vegetation has had an opportunity to recover, the surrounding area remains somewhat fragmentated by roads and CSG infrastructure. Several studies have broadly recognised the koala's dispersal capabilities across cleared land (Melzer 1995; White 1999; Dique et al. 2003a; Matthews et al. 2016). In addition to regular movements across the ground between trees within their own home ranges, koalas, particularly subadult males but also females, are known to disperse across distances of 1 to 3 km but sometimes over 10 km. In contrast, the maximum width of the Development footprint is less than 1 km. Furthermore, sufficient vegetation connectivity will remain in the adjacent vegetation to ensure that any locally occurring koala populations will remain relatively unhindered as they move through this landscape. Given the scale of the proposed impact in the context of the surrounding environment and the lack of existing significant barriers to dispersal, it is unlikely that the removal of 19.8 ha of suitable breeding and foraging habitat, and an additional 10.3 ha of dispersal habitat is likely to fragment an existing koala population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Likely** As detailed in **Section 6.2.3.2** , habitat critical for the survival of the koala can be broadly defined as any habitat that supports foraging, breeding and dispersal opportunities for this species. Whilst no koalas have been observed within the Development footprint, habitat assessments undertaken across the Project have confirmed the presence of suitable habitat for this species. The Project will require the removal of 19.8 ha of suitable breeding and foraging habitat in addition to 10.3 ha of dispersal habitat for the koala which is considered habitat critical to the survival of the species.
Is there a real chance or possibility that the Project will disrupt the breeding cycle of a population?	**Unlikely** The Development footprint is located within the known distribution for the koala, which has different breeding seasons for northern (Dec-May) and southern (all year) populations (DAWE, 2022a). Whilst the construction of the Project will require the removal of 19.8 ha of suitable breeding and foraging habitat in addition to 10.3 ha of dispersal habitat, any locally occurring koala population would only infrequently utilise portions of the Development footprint, spending the majority of their time in adjacent, more productive habitats. Research into the average home range of individual koalas suggests that it can vary greatly, both throughout their entire distribution and over time (DAWE 2022b). Typical home ranges have recorded to vary from 2 ha (central Mackay Coast bioregion) to 169.5 ha (Mulga Lands bioregion). The absence of records within the Development footprint suggests that the Development footprint's habitat values are utilised infrequently. It is therefore considered unlikely that the construction and ongoing operation of the Project could disrupt the breeding cycle of a koala population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of	**Unlikely** Whilst the construction of the Project will require the removal of 19.8 ha of suitable breeding and foraging habitat in addition to 10.3 ha of dispersal habitat for the koala, these impacts only represent a fraction of the available habitat for this species in the adjacent landscape. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself

habitat to the extent that the species is likely to decline?	283,000 ha in size), all of which likely provides similar habitat values for this species. It is therefore considered unlikely that the Project would exacerbate the existing modification, removal, fragmentation or decreased availability of suitable habitat for the koala (either locally or regionally) to the extent that the species would be likely to decline.
Is there a real chance or possibility that the Project will result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?	**Unlikely** Ecological surveys undertaken across the Project have confirmed the presence of various weed and pest species. Feral dogs (which have been identified as threatening processes for the koala) have not been recorded to date but they may periodically occur in the Development footprint. Arrow CSG will develop and implement a WPMP. This WPMP will include management and mitigation measures to ensure that invasive species already present within the Project area (particularly the feral dog) are managed appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact the koala.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** The koala retrovirus (KoRV) and Chlamydia (*Chlamydia percorum*) are both diseases known to be prevalent amongst koala populations (DAWE, 2022a). It is currently unknown whether these diseases are present within the locally occurring population. The removal of 19.8 ha of suitable breeding/foraging habitat and 10.3 ha of suitable dispersal habitat is considered unlikely to directly introduce these diseases into the local population or indirectly exacerbate the symptoms or spread of these diseases whether or not they are already present. Another potential mechanism for spreading existing decease in koala is inappropriate handling of animals if relocations of individuals are required during clearing or injured individuals are encountered. As detailed in **Section 8.2.1.1** handling of koala would only be undertaken by a suitably qualify FSC wearing appropriate PPE and following handling protocols which minimise the risk of spreading these diseases. Therefore, the Project is unlikely to introduce or spread diseases that may cause the species to decline.
Is there a real chance or possibility that the Project will interfere with the recovery of the species?	**Unlikely** The National Recovery Plan for the Koala (DAWE 2022b) outlines several objectives that will complement and build upon existing state and territory plans and strategies for the listed koala, including: • *The area of occupancy and estimated size of populations that are declining, suspected to be declining, or predicted to decline are instead stabilised.* • *The area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased.* • *Metapopulation processes are maintained or improved.* • *Partners, communities and individuals have a greater role and capability in listed koala monitoring, conservation and management.*

	To achieve these objectives, they propose several direct and supportive strategies, which includes the improvement and restoration of habitat values for this species. Although the construction of the Project will require the unavoidable removal of 19.8 ha of suitable breeding and foraging habitat in addition to 10.3 ha of dispersal habitat for the koala, the extent of suitable koala habitat that will be retained in adjoining areas and the region mean that the Project is unlikely to interfere with the recovery of the koala.
It is considered **likely** that the Project will have a significant impact on the koala.	

9.4 South-eastern glossy black-cockatoo (Vulnerable)

To determine whether the Project will have a significant impact on the south-eastern glossy black-cockatoo, an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for vulnerable species has been undertaken, the results of which are provided in **Table 9.5**.

Table 9.5: Assessment of significant residual impacts for the Vulnerable south-eastern glossy black-cockatoo

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of an important population?	**Unlikely** Numerous south-eastern glossy black-cockatoos have been recorded in the region surrounding the Development footprint (including Barakula State Forest and Condamine State Forest), suggesting that a local population may occur, however no individuals have been observed during consolidated survey efforts within the Development footprint. The nearest record is approximately 2 km to the south-east (Arrow Energy 2013). Important populations for the south-eastern glossy black-cockatoo have not been explicitly defined in their conservation advice. It is also important to note that the distribution of the south-eastern glossy black-cockatoo (*Calyptorhynchus lathami lathami*) and northern glossy black-cockatoo (*Calyptorhynchus lathami erebus*) "blend" from about Hervey Bay to Carnarvon National Park. Individuals occurring in the vicinity of the Development footprint are far enough away from the "blending zone" and are therefore within the distribution of the C. *lathami lathami* subspecies to not be considered important for maintaining genetic diversity or the range of occurrence of the species. It is therefore unlikely that any locally occurring populations could constitute an 'important population' for this subspecies on the basis of species' range. Whilst the Project will require the removal of approximately 19.8 ha of potential foraging habitat for this subspecies, this is small relative to the extant habitat that is widespread across adjoining areas. Development footprint Based on the above, it is considered unlikely that the construction and ongoing operation of the Project will lead to a long-term decrease in the size of an important population.
Is there a real chance or possibility that the Project will reduce the area of occupancy of an important population?	**Unlikely** As detailed in the previous response, any locally occurring populations are unlikely to constitute an important population. The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary

	which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA 2024). The area of occupancy for this species was estimated to be approximately 40,000 km^2 (DCCEEW 2022a). Further research is needed to determine how far individuals will travel to reach suitable foraging resources, but initial research on the Kangaroo Island subspecies suggests that they may fly up to 14 km between feeding and nesting areas, with most nests occurring within 1 km of preferred food resources (DCCEEW 2022a). Whilst the construction of the Project will require the removal of 19.8 ha of suitable foraging habitat for this species, there is an abundance of suitable contiguous habitat for this species in the region surrounding the Project. It is therefore considered unlikely that the construction and ongoing operation of the Project will reduce the area of occupancy of an important population.
Is there a real chance or possibility that the Project will fragment an existing important population into two or more populations?	**Unlikely** South-eastern glossy black-cockatoo is a highly mobile species known to fly up to 14 km between feeding and nesting areas (DCCEEW 2022a). The Project currently sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest). Satellite imagery indicates that the Project has previously been subjected to historical clearing dating back to at least 1952 (QI 2025). Whilst the construction of the Project will require the removal of 19.8 ha of suitable foraging habitat, this impact is unlikely to significantly affect dispersal capabilities of a highly mobile species such as the south-eastern glossy black-cockatoo. Furthermore, the removal of this habitat is unlikely to significantly alter the level of fragmentation already present in the surrounding landscape. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Possible** Whilst habitat critical to the survival of the south-eastern glossy black-cockatoo has not been explicitly defined for this species, they are known to be reliant on nine species of sheoaks for foraging, with species selection varying depending on the region (DCCEEW 2022a). As detailed in **Section 6.2.4.2** , the Development footprint contains areas of RE 11.5.1 which contain some buloke (*Allocasuarina luehmannii*), an occasional food source for the species and, therefore this foraging habitat has been conservatively considered as potentially being habitat critical to the survival of this subspecies. Whilst the removal of 19.8 ha of habitat critical to the survival of the species is not considered significant when the mobility of the species and abundance of available habitat in the surrounding landscape is considered, this habitat does represent an area that locally occurring south-eastern glossy black-cockatoo population could utilise as foraging habitat. It is therefore considered that the construction and ongoing operation of the Project may possibly adversely affect habitat critical to the survival of the south-eastern glossy black-cockatoo.
Is there a real chance or possibility that the Project will disrupt the breeding cycle of an important population?	**Unlikely** South-eastern glossy black-cockatoo are known to lay eggs between January and late July (DCCEEW 2022a; DAWE 2022c), with the nesting period lasting approximately 90 days.

	Whilst approximately 19.8 ha suitable foraging habitat has been identified within the Development footprint, habitat assessments have identified a lack of mature vegetation with suitable tree hollows and permanent water resources confirming that the Project is unlikely to support any nesting habitat for this species. It is therefore considered unlikely that the construction and ongoing operation of the Project will disrupt the breeding cycle of an important population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?	**Unlikely** Whilst the construction and ongoing operation of the Project will require the removal of 19.8 ha of suitable foraging habitat, these impacts represent a relatively small fraction of the available habitat in the surrounding region. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size), all of which likely provides similar habitat values for this species considering its regional distribution. Also, no nesting habitat is present within the Development footprint indicating that local populations likely reside outside of this area and may only utilise the available foraging habitat on a temporary/seasonal basis. It is therefore considered unlikely that the construction and ongoing operation of the Project will modify, destroy, isolate or decrease the availability or quality of habitat to the extent that south-eastern glossy black-cockatoo is likely to decline.
Is there a real chance or possibility that the Project will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?	**Unlikely** Whilst ecological surveys undertaken across the Development footprint have confirmed the presence of various weed and pests, invasive species are not listed as a key threatening process for the south-eastern glossy black-cockatoo. Regardless of this, Arrow CSG will develop and implement a WPMP. This plan will ensure that vehicles and other equipment entering the Project area have been sufficiently cleaned and are held to the appropriate Queensland Biosecurity standards. This WPMP will also include management and mitigation measures to ensure that the invasive species already present within the Project area are managed appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact the south-eastern glossy black-cockatoo.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** A single disease has been described as a potential threatening process for the south-eastern glossy black-cockatoo, the Psittacine Beak and Feather Disease (PBFD) (DCCEEW 2022a). This is a potentially fatal disease caused psittacine circovirus, typically transferring between adults, nesting and contaminated nest hollows. Although the south-eastern glossy black-cockatoos are susceptible to this disease, the overall threat level is relatively low compared to other threats. The absence of nesting habitat within the Development footprint suggests that the construction and ongoing operation of the Project is unlikely to introduce this disease into local populations or contribute to the spread of this disease within the local population.

Is there a real chance or possibility that the Project will interfere substantially with the recovery of the species?	**Unlikely** There are numerous conservation and management priorities for the south-eastern glossy black-cockatoo (DCCEEW 2022a), with several related to the protection of suitable breeding and foraging habitat. Considering that the Project will require the removal of 19.8 ha of suitable foraging habitat for this species, the construction and ongoing operation of the Project has the potential to interfere with the following management priorities: • *Protect, restore and enhance the quality of known suitable habitat and increase the extent of habitat (both breeding and foraging) for south-eastern glossy black cockatoo across the subspecies' range (both current and future) to maintain viability in response to threats, including climate change.* • *Protect large old trees and smaller trees that contain large hollows, including those affected by fires. Ensure the recruitment of large old trees by retaining medium-sized trees, facilitating regeneration, and undertaking replanting.* However, the Development footprint does not contain any old trees or trees that contain large hollows / suitable breeding habitat. Also, the abundance of undisturbed foraging habitat remaining within the surrounding landscape indicates that this impact is unlikely to interfere substantially with the recovery of the species, especially when considering the distribution of this species and their highly mobile nature.
It is considered **possible** that the Project will have a significant impact on the south-eastern glossy black-cockatoo.	

9.5 Squatter pigeon (southern) (Vulnerable)

To determine whether the Project will have a significant impact on the squatter pigeon (southern), an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for vulnerable species has been undertaken, and results of which are provided in **Table 9.6**.

Table 9.6: Assessment of significant residual impacts for the Vulnerable squatter pigeon (southern)

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of an important population?	**Unlikely** Several squatter pigeon records have been identified in the region surrounding the Development footprint (including Binkey State Forest, Cherwondah State Forest and Barakula State Forest), suggesting that a local population may occur or periodically utilise available habitat within the Development footprint, however no individuals have been observed during consolidated survey efforts. The nearest record is approximately 12 km to the south-east (Arrow 2012). Important populations for this species have been described in the threatened species profile (DoE 2025b) and incorporate all small and sparsely distributed sub-populations south of the Carnarvon Ranges in central Queensland which includes populations occurring in the Condamine River catchment and Darling Downs. Therefore, any squatter pigeon occurring the vicinity of the Development footprint may be part of an important population. Compared with other parts of the species' range where there is often a concentration of records around a particular location, there is a low number of records within 50 km despite a significant increase in survey effort as a result of gas development in the region. The majority of these records have also been associated with 'atypical' habitat (i.e. roadsides) rather than forested areas.

	The low abundance of records suggest that a local population may periodically utilise available habitat. Considering the low abundance of nearby records, their ability to utilise a wide range of woodland habitats, the likelihood that nearby habitat may only be utilised periodically and the fact potential breeding habitat is avoided, it is unlikely that the removal of 30.1 ha of potential foraging habitat will lead to a long-term decrease in the size of an important population.
Is there a real chance or possibility that the Project will reduce the area of occupancy of an important population?	**Unlikely** As detailed above, any squatter pigeon occurring the vicinity of the Development footprint may be part of an important population. The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA 2024). The area of occupancy for this species is estimated to be approximately 10,000 km^2 (DoE 2025b). Whilst the construction of the Project will require the removal of 30.1 ha of potential foraging habitat for this species, there is an abundance of suitable contiguous habitat in the region and immediately surrounding the Project. It is therefore considered unlikely that the construction and ongoing operation of the Project will reduce the area of occupancy of an important population.
Is there a real chance or possibility that the Project will fragment an existing important population into two or more populations?	**Unlikely** As detailed above, any squatter pigeon occurring the vicinity of the Development footprint may be part of an important population. Whilst the Project currently sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest), satellite imagery indicates that the Development footprint has historically been subjected to clearing dating back to at least 1952 (QI 2025). Whilst much of this vegetation has had an opportunity to recover, the surrounding area remains fragmentated by roads and other utility corridors such as high-voltage powerlines and CSG infrastructure. Whilst the construction of the Project will require the removal of 30.1 ha of potential foraging habitat for this species, this impact is unlikely to significantly affect dispersal capabilities of a highly mobile species such as the squatter pigeon. Furthermore, the removal of this habitat is unlikely to significantly alter the level of fragmentation already present in the surrounding landscape. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing important population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Possible** As habitat within the Development footprint retains the characteristics of a suitable foraging resources, it meets the definition of 'habitat critical for survival' as per the Significant impact Guidelines (DOE 2013). As 30.1 ha of this potential foraging habitat is required to be removed, it is possible that the Project will adversely affect habitat critical to the survival of the squatter pigeon (southern). .
Is there a real chance or possibility that the Project will disrupt the breeding	**Unlikely** Whilst locally occurring individuals do meet the requirements of an important population (as discussed above), there is an abundance of retained suitable breeding habitat for this species in the surrounding areas and region the

cycle of an important population?	Development footprint has been sited to avoid all such breeding habitat. Notably, all but one of the records within 50 km involve single birds, with no sightings of pairs or groups that might indicate breeding activity (Mark Sanders, pers. comm., 2024). It is unlikely that the removal of 30.1 ha of potential foraging habitat would have an impact on the breeding cycle of an important population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?	**Unlikely** Whilst the construction and ongoing operation of the Project will require the removal of 30.1 ha of potential foraging habitat, these impacts only represent a relatively small fraction of the available habitat for this species in the surrounding region. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size), all of which likely provides similar habitat values for this species considering its regional distribution. Furthermore, squatter pigeons are known to forage in disturbed areas which maintain sufficient grass cover such as access tracks and stock yards indicating that their habitat requirements are not explicitly linked to vegetation communities like those mapped within the Development footprint. It is therefore considered unlikely that the construction and ongoing operation of the Project will modify, destroy, isolate or decrease the availability or quality of habitat to the extent that squatter pigeon (southern) is likely to decline.
Is there a real chance or possibility that the Project will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?	**Unlikely** Ecological surveys undertaken across the Project have confirmed the presence of numerous weed and pest species, including feral cats and foxes which are listed as known threats for the squatter pigeon. No Buffel grass was observed during survey efforts across the Project. Arrow CSG will develop and implement a WPMP. This plan will ensure that vehicles and other equipment entering the Project area have been sufficiently cleaned and are held to the appropriate Queensland Biosecurity standards. This WPMP will also include management and mitigation measures to ensure that the invasive species already present within the Project area are managed appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact the diamond firetail.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** There are currently no diseases listed as threatening processes for the squatter pigeon (DoE 2025b). It is considered unlikely that the construction and ongoing operation of the Project will introduce any such diseases.
Is there a real chance or possibility that the Project will interfere substantially with the recovery of the species?	**Unlikely** Several conservation and management priorities have been identified for the squatter pigeon (southern) (DoE 2025b, TSSC 2015b), most of which relate to the protection of habitat for important subpopulations along the southern boundary of their distribution and the general reduction of impacts to habitat across their broader distribution. Despite the unavoidable removal of 30.1 ha of potential foraging habitat, the abundance of similar habitat that will be retaining in the surrounding landscape and

	region mean that the construction and operation of the Project is unlikely to substantially interfere with the recovery of this species.
It is considered **possible** that the Project will have a significant impact on the squatter pigeon (southern).	

9.6 Diamond firetail (Vulnerable)

To determine whether the Project will have a significant impact on the diamond firetail, an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for vulnerable species has been undertaken, the results of which are provided in **Table 9.7**.

Table 9.7: Assessment of significant residual impacts for the Vulnerable diamond firetail

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of an important population?	**Unlikely** Several diamond firetail records have been recorded in the region surrounding the Development footprint (including Gurulmundi State Forest, Barakula State Forest and Condamine State Forest), suggesting that a local population may occur, however no individuals have been observed during consolidated survey efforts across the Development footprint. The nearest record is approximately 23 km to the north-west (ALA 2019). Important populations for this species have not been explicitly defined in their conservation advice. The range for this species once extended into northern Queensland, inland from Cardwell, but they now only occur in the very south of the State. When the currently modelled distribution and recent historical records of this species are considered (eBird 2025; DCCEEW 2023a), it appears that records identified in the region surrounding the Project are likely near the edge of this species modern distribution. In accordance with the Significant Impact Guidelines (DoE 2013), populations that are near the limit of a species range are considered 'important populations'. However, the removal of approximately 30.1 ha of potential breeding and foraging habitat is unlikely to significantly affect the local population considering the extensive areas of similar habitat in the region and surrounding the Development footprint that will be retained. Therefore, it is considered unlikely that the construction and ongoing operation of the Project will lead to a long-term decrease in the size of an important population.
Is there a real chance or possibility that the Project will reduce the area of occupancy of an important population?	**Unlikely** The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA 2024). The area of occupancy for this species is estimated to be approximately 25,000 km^2 (DCCEEW 2023a). Whilst the construction of the Project will require the removal of 30.1 ha of potential breeding and foraging habitat for this species, there is an abundance of suitable contiguous habitat in the region and immediately surrounding the Project. It is therefore considered unlikely that the construction and ongoing operation of the Project will reduce the area of occupancy of an important population.
Is there a real chance or possibility that the Project will fragment an existing	**Unlikely** Whilst the Project currently sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest), satellite imagery indicates that the

important population into two or more populations?	Development footprint has historically been subjected to clearing dating back to at least 1952 (QI 2025). Whilst much of this vegetation has had an opportunity to recover, the surrounding area remains fragmentated by roads and other utility corridors such as high-voltage powerlines and CSG infrastructure. Whilst the construction of the Project will require the removal of 30.1 ha of potential breeding and foraging habitat for this species, this impact is unlikely to significantly affect dispersal capabilities of a highly mobile species such as the diamond firetail. Furthermore, the removal of this habitat is unlikely to significantly alter the level of fragmentation already present in the surrounding landscape. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing important population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Possible** Habitat critical to the survival of the diamond firetail has been specifically defined in the conservation advice (DCCEEW 2023a) which has been summarised in **Section 6.2.6.2** Based on this relatively broad definition, all the vegetation mapped within the Development footprint (which includes regrowth 11.5.1 and non-remnant vegetation) has been interpreted as meeting the requirements of habitat critical to the survival of the species. Whilst the practical impacts likely to result from the removal of 30.1 ha of habitat critical to the survival of the species is not considered significant when the mobile nature of the species and abundance of available critical habitat in the surrounding landscape is considered, this habitat does represent an area that the diamond firetail could utilise for foraging, breeding, roosting and dispersal. It is therefore considered that the construction and ongoing operation of the Project could possibly adversely affect habitat critical to the survival of the diamond firetail.
Is there a real chance or possibility that the Project will disrupt the breeding cycle of an important population?	**Unlikely** Diamond firetails are known to separate into small colonies to breed from around August to January (DCCEEW 2023a). They construct bottle shaped nests made from grasses, feathers which are typically secured to the base or larger stick nests of birds of prey to help protect their young. Whilst the construction of the Project will require the removal of 30.1 ha of potential breeding and foraging habitat, the abundance of available habitat in the surrounding landscape and paucity of records of the species in the wider area suggests that this impact is unlikely to disrupt the breeding cycle of an important population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?	**Unlikely** Whilst the construction and ongoing operation of the Project will require the removal of 30.1 ha of potential breeding and foraging habitat, these impacts only represent a fraction of the available habitat for this species in the surrounding region. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size), all of which likely provides similar habitat values for this species considering its regional distribution. Furthermore, as discussed in the conservation advice (DCCEEW 2023a), the diamond firetail is known to actively utilise open forests and other lightly timbered habitats which have low tree densities, few large logs and high grass cover. Their habitat requirements are not explicitly linked to vegetation communities like those mapped

	within the Development footprint, as they can also utilise predominantly cleared pasture areas where suitable foraging resources (grasses) are present. It is therefore considered unlikely that the construction and ongoing operation of the Project will modify, destroy, isolate or decrease the availability or quality of habitat to the extent that diamond firetail is likely to decline.
Is there a real chance or possibility that the Project will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?	**Unlikely** Ecological surveys undertaken across the Project have confirmed the presence of various weed and pest species, however neither African lovegrass nor European rabbits (which have been identified as threatening processes for the diamond firetail) have been identified within the Development footprint. Regardless of this, Arrow CSG will develop and implement a WPMP. This plan will ensure that vehicles and other equipment entering the Project area have been sufficiently cleaned and are held to the appropriate Queensland Biosecurity standards. This WPMP will also include management and mitigation measures to ensure that the invasive species already present within the Project area are managed appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact the diamond firetail.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** There are currently no diseases listed as threatening processes for the diamond firetail (DCCEEW 2023a). It is considered unlikely that the construction and ongoing operation of the Project will introduce any such diseases.
Is there a real chance or possibility that the Project will interfere substantially with the recovery of the species?	**Unlikely** There are several conservation and management priorities identified for the diamond firetail (DCCEEW 2023a), most of which relate to reducing habitat loss. Although the Project will require the removal of 30.1 ha of potential breeding and foraging habitat, the abundance of undisturbed habitat remaining within the surrounding landscape, the broad range of habitats that the diamond firetail utilises, coupled with the paucity of records in the wider area and the mobile nature of the species, indicates that the unavoidable Project impacts are unlikely to interfere substantially with the recovery of the species.
It is considered **possible** that the Project will have a significant impact on the diamond firetail.	

9.7 Dunmall's snake (Vulnerable)

To determine whether the Project will have a significant impact on the Dunmall's snake, an assessment of potential impacts against the EPBC Act Significant Impact Guidelines (DoE, 2013) for vulnerable species has been undertaken, the results of which are provided in **Table 9.8**.

Table 9.8: Assessment of significant residual impacts for the Vulnerable Dunmall's snake

SIA Criteria	Project Response
Is there a real chance or possibility that the Project will lead to a long-term decrease in the size of an important population?	**Possible** Dunmall's snake is very rarely encountered, even in areas of known habitat and has been described as 'extremely secretive, rarely encountered, possibly genuinely scarce' (Wilson 2022). Whilst the Development footprint does not contain any preferred habitat for this species (brigalow on cracking black clay and clay loams), they are known to utilise open forests and woodlands dominated by various blue spotted gum, ironbark, white cypress and buloke which has been identified within the Project (regrowth RE 11.5.1). Habitat assessments through these areas have confirmed the presence of suitable microhabitat features that this species is known to require, including scattered coarse woody debris, soil cracks and termite mounds. Whilst important populations of Dunmall's snake are not defined in the referral guidelines for this species (DCCEEW 2023b), these guidelines advise that important habitat should be used as a surrogate for important populations. As discussed above (**Sections 6.2.7.2** and **Section 6.2.7.3**), the contiguous habitat in the region surrounding the Development footprint suggests that both important habitat and important populations have the potential to occur within the Development footprint. The construction of the Project will require the unavoidable removal of 19.8 ha of potential breeding and foraging for the Dunmall's snake. Therefore, it is possible that the removal of 19.8 ha of potential habitat could lead to a long-term decrease in the size of an important population.
Is there a real chance or possibility that the Project will reduce the area of occupancy of an important population?	**Possible** The area of occupancy for a species is defined as the area within its extent of occurrence (an area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of occurrence) which is occupied by a species, excluding cases of vagrancy (ALA 2024). While the conservation advice for this species does not include an estimated area of occupancy, using the ALA tool, this has been estimated to be approximately 1,816 km^2 (ALA 2025). Whilst the construction of the Project will require the removal of 19.8 ha of potential foraging and breeding habitat for this species, there is an abundance of similar contiguous habitat for this species in the areas surrounding the Project. As detailed in the **Section 6.2.7.3** and the preceding response, suitable habitat for this species should be used as a surrogate for important populations. Considering how difficult it can be to detect this species, and the fact that the Project will require the removal of 19.8 ha of suitable habitat, there is a possibility that the construction and ongoing operation of the Project could reduce the area of occupancy of an important population.
Is there a real chance or possibility that the Project will fragment an existing important population into two or more populations?	**Unlikely** Whilst the Project currently sits within a larger patch of mostly contiguous vegetation (including Barakula State Forest), satellite imagery indicates that the Project has previously been subjected to historical clearing dating back to at least 1952 (QI 2025). Whilst much of this vegetation has had an opportunity to recover, the surrounding area remains fragmentated by roads and other utility corridors such as high-voltage powerlines and CSG infrastructure. Whilst the construction of the Project will require the removal of 19.8 ha of potential breeding and foraging habitat, the limited extent and condensed shape of the

	Development footprint relative to adjoining habitat areas is unlikely to significantly restrict the ability of any locally occurring population to traverse the landscape or affect dispersal capabilities of this species. Furthermore, the removal of this habitat is unlikely to significantly change the level of fragmentation already present in the wider and surrounding landscape. It is therefore considered unlikely that the construction and ongoing operation of the Project will fragment an existing important population into two or more populations.
Is there a real chance or possibility that the Project will adversely affect habitat critical to the survival of a species?	**Possible** As discussed in **Section 6.2.7.2** areas of suitable habitat identified within the Development footprint (patches of regrowth RE 11.5.1) meet the definitions of 'important habitat' and 'habitat critical to the survival of the species' provided in the draft referral guidelines for brigalow reptiles (DCCEEW 2023b). These guidelines (DCCEEW 2023b), also advise that the clearing of four or more hectares of important habitat should be considered to represent a high risk of significant impact upon this species. Therefore,, as the construction and ongoing operation of the Project will require the removal of approximately 19.8 ha of potential important habitat / habitat critical to the survival of the species it is possible that this impact will adversely affect the species.
Is there a real chance or possibility that the Project will disrupt the breeding cycle of an important population?	**Possible** Very little is known about the breeding cycle of the Dunmall's snake (DoE 2025b), but it has been confirmed that they lay eggs as opposed to give birth to live young. As discussed in the previous responses, the contiguous habitat in the region surrounding the Development footprint suggests that both important habitat and important populations could potentially occur within the Development footprint. Considering that the construction and ongoing operation of the Project will require the removal of approximately 19.8 ha of suitable habitat, and how little is known about the reproductive ecology of this species, it is difficult to rule out the possibility that the clearing of this habitat could disrupt the breeding cycle of an important population.
Is there a real chance or possibility that the Project will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?	**Unlikely** Although no preferred habitat was identified for the Dunmall's snake within the Development footprint (i.e. brigalow habitats growing on cracking black clay and clay loams) (DCCEEW 2023b) suitable habitat was confirmed to be present (patches of regrowth RE 11.5.1 with abundance of small-medium sized coarse woody debris). The contiguous nature of the vegetation surrounding the Project suggests that an important population may occur or periodically utilise these habitat values. The Project is located within a large area of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size), all of which likely provides similar habitat values for this species considering its regional distribution. While the construction of the Project will require the removal of approximately 19.8 ha of potential breeding and foraging habitat, these impacts only represent a relatively small proportion of that available in the surrounding areas. Furthermore, the removal of this habitat is unlikely to significantly contribute to the level of fragmentation already present in the surrounding landscape. It is therefore considered unlikely that the construction and ongoing operation of the Project will modify, destroy, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Is there a real chance or possibility that the Project will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?	**Unlikely** Predation by feral animals has been identified as a potential threat for this species (particularly cane toads, feral cats and feral pigs) (DCCEEW 2023b), all of which have been confirmed as present within the Development footprint. Several weed species have also been identified in the vicinity. However, Arrow CSG will develop and implement a WPMP and/or Weed and Pest Management Section within the CEMP and OEMP. This plan/section will ensure that vehicles and other equipment entering the Project area are sufficiently cleaned and maintained to the appropriate Queensland Biosecurity standards. This WPMP/Section will also include management and mitigation measures to ensure that the invasive species already present within the Project area are managed appropriately to ensure that their presence is not exacerbated by the construction and ongoing operation of the Project, and no new invasive species become established. With these measures in place, it is considered unlikely that the Project will lead to any new invasive species becoming established within the Project area that could impact Dunmall's snake.
Is there a real chance or possibility that the Project will introduce disease(s) that may cause the species to decline?	**Unlikely** There are currently no diseases listed as threatening processes for the Dunmall's snake (DoE 2025b). It is considered unlikely that the construction and ongoing operation of the Project will introduce any such diseases into locally occurring populations.
Is there a real chance or possibility that the Project will interfere substantially with the recovery of the species?	**Unlikely** There are numerous conservation and management actions listed for the Dunmall's snake within the conservation advice (DoE 2025b), however none of these are relevant to the Project or Development footprint. As detailed in previous sections, the Development footprint is situated within a large patch of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size) that constitutes both important habitat and an important population for the Dunmall's snake. Patches of regrowth RE 11.5.1 mapped within the Development footprint represent suitable habitat for this species and contain abundant microhabitat features including small-medium sized coarse woody debris, soil cracks and termite mounds. Development footprintWhile the construction of the Project will require the removal of approximately 19.8 ha of potential breeding and foraging, these impacts only represent a fraction of the available habitat for this species in the surrounding areas. Furthermore, the removal of this habitat is unlikely to significantly contribute to the level of fragmentation already present in the surrounding landscape. Additionally, Arrow CSG will develop and implement a WPMP to help manage feral pest species present within the Project area. It is therefore considered unlikely that the Project will substantially interfere with the recovery of this species.
It is considered possible that the Project will have a significant impact on the Dunmall's snake.	

9.8 MNES Significant Impact assessment conclusion

As detailed in **Section 9.1** to **Section 9.7**., the Project is *likely to have a significant residual impact* on:

- Koala

The Project may also *possibly have a significant residual impact* on:

- Corben's long-eared bat
- South-eastern glossy black-cockatoo
- Squatter pigeon
- Diamond firetail
- Dunmall's snake.

The significant residual impact relates to the direct unavoidable removal of:

- 19.8 ha of potential Corben's long-eared bat roosting and foraging habitat and 10.3 ha of potential foraging only habitat
- 19.8 ha of potential koala breeding and foraging habitat and 10.3 ha of dispersal habitat
- 19.8 ha of potential South-eastern glossy black-cockatoo foraging habitat
- 30.1 ha of potential squatter pigeon foraging habitat
- 30.1 ha of potential diamond firetail breeding and foraging habitat
- 19.8 ha of potential Dunmall's snake breeding and foraging habitat.

Section 10 addresses the offsets that are proposed to compensate for these unavoidable impacts.

10. Proposed offsets

An Offset Proposal and an Offset Management Plan has been developed to compensate for the Project's unavoidable impacts and achieve conservation gains consistent with the EPBC Act Environmental Offsets Policy (2012) for all potentially impacted MNES matters. These are presented as **Appendix C** and **Appendix D** respectively.

11. Economic and Social Matters

11.1 Project costs and benefits

The Project is only a small component of the overall SGP North development and discrete in comparison to major solar developments occurring elsewhere in the Miles region. The Project will contribute to Arrow's greater presence in the Surat Basin, through which Arrow provides more than $1.5million in social and community investment, and around $50million in local spend, each year.

The Project will operate under a build, own and operate model, whereby the power supply entity assumes responsibility for the capital investment, construction, and ongoing operation of the facility. Arrow CSG gains benefits from predictable and potentially lower energy costs through a structured monthly tariff, without incurring upfront capital expenditure. Economic benefits include reduced exposure to wholesale electricity price volatility, improved budget certainty, and alignment with sustainability objectives. Costs are limited to the agreed tariff payments, which are indexed and structured to energy consumption.

11.1.1 Employment

The Project is expected to generate meaningful employment opportunities across various phases of development, construction, and ongoing operations. During the construction phase, the power supply entity will engage a range of skilled and semi-skilled workers including electricians, civil contractors, equipment operators, and project managers. Post-construction, ongoing roles will include site maintenance, monitoring, and administrative support. The power supply entity has committed to adhere to local content requirements by prioritising local workforce participation, contributing to regional job creation and skills development. This supports economic development within the local community, strengthens regional supply chains, and fosters long-term stakeholder engagement.

It is estimated that the construction workforce of approximately 50 FTE equivalent personnel will be required. Employment within the local region is preferred, with workers ideally accommodated locally in townships. Where workers cannot be sourced locally, they will be housed in an existing accommodation camp located within Miles.

Operationally, it is expected that the project will support up to either direct or indirect jobs through the operational life of the project. While the operational roles will require expertise, the preference is to hire locally and provide appropriate training. If the operational workforce cannot be sourced from the local area, a rostered FIFO rotational basis would occur.

The Project will utilise local resources for site maintenance, including weed management, for approximately 72 hours per month. It is estimated that approximately 120 hours per year would be required from other local contractors (e.g. mechanical, electrical, refrigeration) for Project maintenance.

If the Project were not the proceed, the additional workforce opportunities described above would not be available.

11.2 Stakeholder consultation

Public consultation has been conducted under the Queensland EP Act for the broader SGP North development as part of Arrow CSG's request to amend EA0001399. The Project falls with the SGP North development area. Local consultation will occur as part of the State approval process described in **Section 2.2**.

Arrow CSG has communicated widely about its SGP North development which has included engagement with key stakeholders with respect to the Project. Broader consultation activities for SGP North include:

- A media announcement on 12 August 2024 with media coverage reaching a potential audience of 4.3 million people.
- Email/Letters to stakeholders currently engaged for SGP North development (2 August 2024)
- An information session presentation for the Western Downs Regional Council (2 August 2024)
- The publication of a notice in the local newspaper, Western Downs Today between 2-31 August 2024 as required by Section 152 of the EP Act.

- Direct neighbour engagement (from November 2024)
- Various information session presentations to the Miles & District Chamber of Commerce provided information updates on SGP North including construction of a Field Compression Station including the associated solar farm project (across 2004 and 2025).
- Various email updates to the Miles Chamber of Commerce including 23 January 2025 notification of Arrow's EPBC application for the solar Farm in referral stage..
- Letters to landholders in the area.
- Meetings with various stakeholder groups.

Copies of communications were provided with the original referral. Feedback on the solar farm from these forums has been limited to questions of general interest only, i.e. to enquire about the purpose of the solar farm with no concerns raised about its development.

Where appropriate, Arrow CSG will continue to engage with the community regarding the SGP North Solar Farm Project as part of broader conversations relating to the SGP North development and respond to any stakeholder enquiries. In addition, Arrow CSG has plans to provide ongoing community updates relevant to stakeholders relating to the SGP North development which will include the Project where relevant.

11.2.1 Indigenous engagement

The current registered Native Title claimants for the land containing the Development footprint, the Iman People #4, were contacted in February 2023 regarding the SGP North Solar Farm Project. Arrow CSG has an established and ongoing relationship with the Iman #4 People regarding the care and protection of cultural heritage values.

A cultural heritage assessment of the land containing Development footprint was undertaken on 28 February 2023 with four representatives of the Iman People #4. No tangible or intangible Indigenous heritage values were identified however, the Iman People still manage the indigenous cultural landscape of this area and its surrounds with Arrow CSG to ensure that impacts to heritage values are minimised.

The findings of these assessments are included in the Cultural Heritage Field Assessment 2021 however, the unredacted version of this document cannot be made publicly available as it contains the names and signatures of Iman People and Arrow CSG staff. Furthermore, the presence or absence of indigenous cultural heritage should not be made public. As redacted version of the Cultural Heritage Field Assessment for the Project is provided as **Appendix N**.

If any new heritage values are found during construction, there are mechanisms in place to further involve the Iman People to manage any impacts.

12. Ecologically Sustainable Development

The EPBC Act (s 3A) sets out the principles of ecologically sustainable development (ESD) that apply where MNES may be impacted by a proposal. How Arrow CSG has, and will have, regard for these principles is detailed below.

Principle 1: Decision-making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations.

The Project balances long and short-term economic, environmental, social and equitable considerations by:

- adopting a hybrid power solution which combines gas and renewable technologies to meet the electricity demand generated by the FCS, thereby reducing the greenhouse gas emissions associated with gasfield operations by up to 21,000 tonnes $CO_{2\text{-}e}$ per annum
- locating the solar farm in close proximity to the demand source (the FCS) and co-locating infrastructure required for site access and electricity transmission with approved clearing corridors to minimise unnecessary clearing of native vegetation and habitat;
- prioritising the use of existing cleared areas for development which minimise impacts on MNES and their habitat; and
- minimising interaction with adjoining areas of remnant vegetation and habitat and incorporating adequate APZs to minimise ignition risk from on-site operations, while also protecting the facility from unmanaged bushfire.

Principle 2: If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The proposed action is not expected to result in serious and irreversible environmental damage to the receiving environment. Throughout the design process for the Project, Arrow CSG have followed the avoid, minimise, mitigate, and offset hierarchy to ensure the proposed action does not lead to serious and / or irreversible environmental damage. Arrow CSG understands and has committed to implementing the necessary management plans to ensure any potential indirect impacts to species are minimised, and avoided where practicable, for the duration of the Project.

Principle 3: The principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The Project has considered the principle of inter-generational equity by committing to maintaining, and where possible, improving the ecological and safety outcomes of the Project. The adoption of renewable energy technology as part of its overall gasfield operations demonstrates Arrow CSG's commitment to Australia's ambition to transition to a low-carbon future. Arrow CSG is committing to adopting a suite of management measures to be implemented during the construction and throughout the use of the proposed development to ensure there are no further adverse impacts to MNES.

Principle 4: The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making.

The conservation of biological diversity and ecological integrity has been a fundamental part of the decision-making process throughout the development of the Project. As described above, throughout the design phase, Iberdrola has demonstrated the mitigation hierarchy has been central to its design making with regard to the design of the Project. In the first instance, Arrow CSG identified the Development footprint based on its historical land use which has resulted in reduced ecological values compared with adjoining remnant areas.

Arrow CSG has also demonstrated its commitment to minimising impacts on MNES, progressively refining the Development footprint to avoid higher-ecological value remnant areas to the north and east. Further, a suite of measures to minimise and mitigate impacts to species that may be present or utilise the Site have been developed for implementation through the construction and use phases of the proposed development.

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