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Melbourne Airport Business Park (MABP) – Sky Road West Warehouses

6 August 2026

Preliminary Documentation EPBC 2023/09633



Document Information

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Melbourne Airport Business Park (MABP) – Sky Road West Warehouses

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Senversa acknowledges the traditional custodians of the land on which this work was created and pay our respect to Elders past and present.

Contents

Document Information ..... **i**

Contents ..... **iii**

List of Acronyms ..... **vii**

1.0 Introduction **1**

2.0 Regulatory Framework **8**

2.1 Airports Act 8

2.1.1 Airports (Building Control) Regulations 1996 8

2.1.2 Airports (Environment Protection) Regulations 1997 8

2.1.3 Melbourne Airport Master Plan 9

2.2 EPBC Act 9

3.0 Description of the Action **10**

3.1 Project Need 10

3.2 Project Description 10

3.2.1 Pre-construction 11

3.2.2 Construction 11

3.2.3 Operations and Maintenance 12

4.0 Habitat Assessments **13**

4.1 Habitat Assessment 13

4.1.1 Threatened Ecological Communities 13

4.1.2 Threatened Species 13

4.1.2.1 Golden Sun Moth 14

4.1.2.2 Striped Legless Lizard 14

4.1.2.3 Victorian Grassland Earless Dragon 14

4.1.2.4 Growling Grass Frog 15

4.1.2.5 Other Species 15

4.1.3 Migratory Species 15

4.1.3.1 Summary of Habitat Assessments and Targeted Surveys for Threatened Species 16

4.1.4 Golden Sun Moth 16

4.1.5 Striped Legless Lizard 17

4.1.6 Growling Grass Frog 17

4.1.7 Victorian Grassland Earless Dragon 17

4.2 Review of Adequacy of Surveys 18

4.2.1 Vegetation 18

4.2.2 Fauna 19

4.2.2.1 Land Management and Disturbance History 20

4.2.2.2 Dispersal 20

4.3 Landscape Context 21

5.0 Impacts 22

5.1 Listed Threatened Species and Ecological Communities 22
5.1.1 General Information on Impacts 22
5.1.2 Golden Sun Moth (Critically Endangered) 22
5.1.3 Striped Legless Lizard (Vulnerable) 22
5.1.4 NTGVVP (Critically Endangered) 22
5.1.5 Victorian Grassland Earless Dragon 23
5.1.6 Growling Grass Frog 23
5.2 Commonwealth Land 23
5.2.1 Impacts on Landscapes and Soils 24
5.2.2 Impacts on Coastal Landscapes and Process 24
5.2.3 Impacts on Ocean Forms, Ocean Processes and Ocean Life 24
5.2.4 Impacts on Water Resources 25
5.2.5 Pollutants, Chemicals, and Toxic Substances 25
5.2.6 Impacts on Plants 25
5.2.7 Impacts on Animals 26
5.2.8 Impacts on People and Communities 27
5.2.9 Impacts on Heritage 27
5.2.10 Site Contamination 28
5.3 Cumulative Impacts 30
5.3.1 Residual Impacts of the Proposed Action 30
5.3.2 Potential for Cumulative Impacts 30
5.3.3 Potential for Existing Pressures and Threats to be Exacerbated 30

6.0 Avoidance, Mitigation and Management Measures 31

6.1 Avoidance Measures 31
6.2 Construction Phase Management and Mitigation Measures 31
6.3 Retained Vegetation 32
6.4 Summary of Avoidance, Mitigation and Management Measures 32

7.0 Offsets 33

7.1 Likelihood of Residual Significant Impacts on MNES 33
7.2 Proposed Offset Strategy 33
7.2.1 Habitat Quality Scoring System for NTGVVP 34
7.3 Offset Management Plan 35

8.0 Ecologically Sustainability Development (ESD) 36

9.0 Economic and Social Matters 39

9.1 Economic and Social Impacts 39
9.2 Stakeholder Consultation 40
9.2.1 Public Consultation 40

9.2.2 Indigenous Consultation 40
9.3 Projected Economic Costs and Benefits 40
9.4 Employment Opportunities 40
10.0 Environmental Record of the Person Proposing to Take the Action 41
10.1 History of Responsible Environmental Management 41
10.2 Environmental Management Framework 41
11.0 Conclusion 42
12.0 References 44
13.0 Principles and Limitations 46

Tables in Text

Table 1-1: DCCEEW's RFI and Where this Information is Provided within this Document 1
Table 5-1: Significant Impact Assessment for NTGVVP 22
Table 5-2: Environmental Settings 28
Table 6-1: Avoidance, Mitigation and Management Measures 32
Table 7-1: Impact Calculator (Biosis 2026c) 35
Table 8-1: Principles of ESD 37
Table 13-1: Principles and Limitations 46

Figures

Figure 1: Proposed Warehouse Locations 47
Figure 2: Business Park Master Plan 47
Figure 3: Existing Infrastructure 47
Figure 4: EPBC Listed Species within Melbourne Airport 47
Figure 5: Previous GSM Surveys 47
Figure 6: Previous SLL Survey 47
Figure 7: Previous GGF Surveys 47
Figure 8: NTGVVP to be Removed 47
Figure 9: Heritage Places 47
Figure 10: Long Term Development Concept Plan 47

Appendices

Appendix A: DCCEEW Request for Further Information (Letter Reference 306 v3.2, 22 January 2024) – Submission Reference EPBC 2023/09633

Appendix B : EPBC Protected Matters Search Tool

Appendix C: Grassland Mapping at Sky Road West, Melbourne Airport (Biosis 2023)

Appendix D: Victorian Grassland Earless Dragon Survey (Biosis 2024)

Appendix E: DCCEEW Response to Preliminary Documentation – Melbourne Airport Business Park (2023/09633) (27 May 2025)

Appendix F: DCCEEW Request for Further Information (Letter Reference 306 v4.6, 30 October 2025) – Submission Reference EPBC 2023/09633

Appendix G: Sky Road West Preliminary Documentation: Targeted survey results (Biosis 2026a)

Appendix H: Melbourne Airport PFAS Investigation Results (Cardno 2018)

Appendix I: Sky Road Extension Soil Investigation Report (Aurecon 2021)

Appendix J: Soil Contamination Assessment: Proposed Warehouse, Lot 7, Sky Road, Melbourne Airport, Victoria 3045 (A.S.James 2023)

Appendix K: Eastern Extension Project: Baseline Assessment of Natural Temperate Grassland at 379 Bullarook Road, Weerite (Biosis 2026b)

Appendix L: Offsets Assessment Guide Calculator (Biosis 2026c)

List of Acronyms

Acronym	Definition
ABC	Airport Building Controller
AEO	Airport Environment Officer
Airports Act	*Airports Act 1996* (Cth)
APAM	Australia Pacific Airports (Melbourne) Pty Ltd
ASC	Assessment of Site Contamination
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CoPC	Contaminant of Potential Concern (CoPC)
CSM	Conceptual Site Model
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEECA	Department of Energy, Environment and Climate Action
DEWHA	Department of Environment, Water, Heritage and the Arts (now DCCEEW)
DITRDCSA	Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts
DoE	Department of the Environment (now DCCEEW)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DCCEEW)
DSI	Detailed Site Investigation
EMP	Environmental Management Plan
EMS	Environmental Management System
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ESG	Environment, Social and Governance
EVC	Ecological Vegetation Class
ESD	Ecologically Sustainability Development
GGF	Growling Grass Frog

Acronym	Definition
GSM	Golden Sun Moth
ha	Hectare
IUCN	International Union for Conservation of Nature
km	Kilometre
LET	Local Employment Target
m	Metre
m bgl	Metres Below Ground Level
MABP	Melbourne Airport Business Park
M3R	Melbourne Airport Third Runway
MDP	Major Development Plan
MNES	Matters of National Environmental Significance
NEMP	National Environmental Management Plan
NTGVVP	Natural Temperate Grassland of the Victorian Volcanic Plain
NWQMS	National Water Quality Management Strategy
OMP	Offset Management Plan
PD	Preliminary Documentation
PFAS	Per- and polyfluoroalkyl substances
PSI	Preliminary Site Investigation
RAP	Registered Aboriginal Party
RFI	Request For Information
SLL	Striped Legless Lizard
TEC	Threatened Ecological Community
UFP	Unexpected Finds Protocol
VAHR	Victorian Aboriginal Heritage Register
VGED	Victorian Grassland Earless Dragon
VQA	Vegetation Quality Assessment
VVP	Victorian Volcanic Plain

1.0 Introduction

Senversa Pty Ltd (Senversa) has been engaged by Australia Pacific Airports (Melbourne) Pty Ltd (APAM) to prepare this Preliminary Documentation (PD) in support of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval for impacts on the Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) ecological community associated with the Melbourne Airport Business Park (MABP) – Sky Road West Warehouses (" the project" / "the proposed action").

The EPBC Act referral application for the proposed action was submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for assessment on 24 August 2023 (application reference EPBC 2023/09633).

The referral decision, issued by DCCEEW via letter (reference 2023/09633) dated 14 November 2023, was that the proposed action is a controlled action requiring assessment by PD and approval under the EPBC Act before it can proceed.

This PD has been prepared with consideration to further information requested by the DCCEEW request for information (RFI) via letter dated 22 January 2024 (**Appendix A**), and subsequently updated to address DCCEEW's response to the PD review issued via email on 27 May 2025 (**Appendix E**) and further correspondence via letter dated 30 October 2025 (**Appendix F)**. In response to the matters raised during DCCEEW's review, additional ecological investigations were undertaken by Biosis (2026), including updated vegetation assessments and targeted surveys for Golden Sun Moth (*Synemon plana*), Striped Legless Lizard (*Delma impar*) and Growling Grass Frog (*Litoria raniformis*). The results of these investigations are provided in **Appendix G** and have been incorporated into the assessment presented in this PD.

Table 1-1 summarises DCCEEW's information requests and review comments, and references the relevant sections of this PD where these matters have been addressed.

Table 1-1: DCCEEW's RFI and Where this Information is Provided within this Document

Item	Information Required	Section in this Document
	Description of the Action	
1.1	The location, boundaries and size (in hectares) of the area of the proposed action and the proposed disturbance footprint (if different to the area of the proposed action). Include mapping and coordinates as per the *Guide to providing maps and boundary data for EPBC Act Projects (https://www.dcceew.gov.au/sites/default/files/documents/epbca-maps-data-guidelines.pdf)*. Mapping should include any adjoining areas which may be directly or indirectly impacted by the proposal, including nearby vegetation, as well as listed species habitat.	**3.2** **Figure 1** **Figure 4** **Figure 5** **Figure 6** **Figure 7** **Figure 8**
1.2	A description of all components of the project and how they relate to the broader maintenance and operations at Melbourne Airport, including the anticipated timing and duration (including start and completion dates) of each component of the project including: i. The proposed construction activities associated with each stage (pre-construction, construction, and operations). ii. The excavation techniques to be used during the proposed works. iii. The plans for earth works and road surfacing. iv. The surface water management designs.	**3.0**
1.3	A description of the operational requirements of the action including any anticipated ongoing maintenance works and the construction environmental management plan.	**3.2.2** **3.2.3**
1.4	An indicative layout plan for the proposed action, including the location and type of land use, key infrastructure, and stormwater management. Include mapping and coordinates for each of the above maps as per the *Guide to providing maps and boundary data for EPBC Act Projects (https://www.dcceew.gov.au/sites/default/files/documents/epbca-maps-data-guidelines.pdf)*.	**3.2** **Figure 1** **Figure 2** **Figure 3**

Item	Information Required	Section in this Document
	Habitat Assessments	
2.1.1	Provide a recently updated summary of the habitat assessment for listed threatened species and communities in the area of the proposed action and the disturbance footprint that includes a summary of patches of **species habitat** and **buffer zones**, as described in Appendix C [of DCCEEW's RFI].	**4.0**
2.1.2	Identify and describe records of the listed threatened species and ecological communities in the broader region. All known records must be supported by an appropriate source (i.e., Commonwealth and State databases, published research, publicly available survey reports, etc.), the year of the record and a description of the habitat in which the record was identified.	**4.1** **Appendix C**
2.1.3	Provide detailed mapping of suitable habitat within, adjacent to and downstream of the area of the proposed action for all listed threatened species and communities, which: • Is specific to the habitat assessment undertaken for each listed threatened species and ecological community; • Includes an overlay of the project disturbance footprint and the area of the proposed action (from 1.1); • Includes known records of individuals derived from the desktop analysis (from 2.1.1 and 2.1.2) and any additional field surveys; and • Is provided separately as attachments in PDF and Shapefile(s).	**4.0** **Figure 4** **Figure 5** **Figure 6** **Figure 7** **Figure 8**
2.1.4	Results of targeted surveys to confirm the presence, status and extent of listed threatened species and communities within the area of the proposed action, undertaken in accordance with the guidance outlined in the Species Profile and Threats Database, if applicable.	**4.2** **Appendix C** **Appendix D**
2.1.5	An assessment of the adequacy of any surveys undertaken (including survey effort and timing). In particular, the extent to which these surveys were appropriate for the listed species or community and undertaken in accordance with relevant departmental survey guidelines.	**4.3** **Appendix C**
2.1.6	An assessment of the landscape (airport wide) context of threatened species habitat and ecological communities including connectivity between patches of habitat or ecological community, condition, sizes of patches, and approximate size of threatened species populations (if present) to inform a consideration of cumulative impacts across the airport.	**4.4**
	Relevant Impacts - Listed Threatened Species and Communities: General Information on Impacts	
3.1.1	Consideration of impacts must include direct, indirect and facilitated impacts occurring as a result of the action, including consideration of the nature, likelihood and severity of the impacts.	**5.1.1**
3.1.2	A discussion of whether the impacts are likely to be repeated, for example as part of maintenance.	**5.1.1**
3.1.3	A discussion of whether any impacts are likely to be unknown, unpredictable or irreversible.	**5.1.1**
3.1.4	Justification, with supporting evidence, on how the proposed action will not be inconsistent with relevant conservation advice, recovery plans or threat abatement plans.	**5.0**

Item	Information Required	Section in this Document
	Relevant Impacts - Listed Threatened Species and Communities: Golden Sun Moth *Synemon plana* – Vulnerable.	
3.1.5	Provide mapping which includes an overlay of the project footprint and known records and habitat of Golden Sun Moth (GSM) derived from desktop analysis and field surveys.	**4.2.1** **Figure 5**
3.1.6	Results from targeted surveys to confirm the status and extent of GSM habitat within and adjacent to the area of the proposed action, undertaken in accordance with the survey guidelines outlined in the *Significant impact guidelines for the critically endangered golden sun moth (Synemon plana).* Provide the scientific reasoning for how the extent of potential habitat for the Golden Sun Moth was derived.	**4.2.1** **4.3.2** **Figure 5** **Appendix G**
3.1.7	The total area (in hectares) and quality of habitat to be impacted, and the science informing these areas and impacts.	**4.2.1** **5.1.2** **Appendix G**
3.1.8	Provide the scientific reasoning for how the extent of potential habitat for the GSM was derived.	**4.1.2.1** **4.2.1** **5.1.2** **Appendix G**
	Relevant Impacts - Listed Threatened Species and Communities: Striped Legless Lizard Delma impar - Vulnerable	
3.1.9	Provide mapping which includes an overlay of the project footprint and potential habitat of Striped Legless Lizard (SLL) derived from desktop analysis and field surveys.	**4.2.2** **Figure 6**
3.1.10	Results from targeted surveys to confirm the status and extent of SLL habitat within and adjacent to the area of the proposed action, undertaken in accordance with the survey guidelines in *Survey guidelines for Australia's threatened reptiles*. Provide the scientific reasoning for how the extent of potential habitat for the Striped Legless Lizard was derived.	**4.1.2.2** **4.2.2** **4.3.2** **Figure 6** **Appendix G**
3.1.11	The total area (in hectares) and quality of habitat to be impacted, and the science informing these areas and impacts.	**4.2.2** **5.1.3** **Appendix G**
3.1.12	An assessment of the adequacy of any surveys undertaken (including survey effort, timing and accordance with department's relevant scientific and policy guidance).	**4.2.2** **5.1.3** **Appendix G**
	Relevant Impacts - Listed Threatened Species and Communities: Natural Temperate Grassland of the Victorian Volcanic Plain – Critically Endangered	
3.1.13	Assessment of all habitat's specific features available in the area of the proposed action as per the habitat described in the *Approved Conservation Advice for Natural Temperate Grassland of the Victorian Volcanic Plain*.	**4.1.1** **4.3.1** **5.1.4** **Appendix G**
3.1.14	Provide the scientific reasoning for how the extent of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) is derived.	**4.1.1** **4.3.1** **5.1.4** **Appendix G**
3.1.15	The total area (in hectares) and quality of NTGVVP to be impacted, and the science informing these areas and impacts.	**4.1.1** **4.3.1** **5.1.4** **Figure 8** **Appendix C** **Appendix G**
3.1.16	Substantiated evidence that 'no-go zones' and buffer zones would protect areas of NTGVVP outside the area of the proposed action.	**5.1.4** **6.2**

Item	Information Required	Section in this Document
	Relevant Impacts - Listed Threatened Species and Communities: Victorian Grassland Earless Dragon *Tympanocryptis pinguicolla* – Critically Endangered	
3.1.17	Assessment of all the habitat's specific features available in the area of the proposed action as per the habitat described in the *Approved Conservation Advice for Tympanocryptis pinguicolla* (*Victorian grassland earless dragon*) and in line with the habitat and diet requirements from the *Draft National Recovery Plan for Four Grassland Earless Dragons (Tympanocryptis spp.) of Southeast Australia*.	**4.2.4** **4.3.2** **Appendix D**
3.1.18	Provide the scientific reasoning for how the extent of known and unknown potential habitat for the Victorian Grassland Earless Dragon were derived.	**4.1.2.3** **4.2.4** **4.3.2** **Appendix D**
3.1.19	Provide an assessment of the likely impacts to the Victorian Grassland Earless Dragon.	**5.1.5** **Appendix D**
	Relevant Impacts - Listed Threatened Species and Communities: Growling Grass Frog *Litoria raniformis* – Vulnerable	
3.1.20	Provide mapping which includes an overlay of the project footprint and potential habitat of Growling Grass Frog derived from desktop analysis and field surveys.	**4.2.3** **Figure 7**
3.1.21	An assessment of the potential direct or indirect impacts (including downstream impacts), and the science informing these areas and impacts.	**4.1.2.4** **Appendix G**
	The Environment of Commonwealth Land: Impacts to the Environment of Commonwealth Land	
3.2.1	For actions impacting on Commonwealth land, the preliminary documentation will need to identify and evaluate impacts to the environment as described under section 526 of the EPBC Act (Appendix C [of DCCEEW's RFI]).	**5.2**
3.2.2	Information regarding characterisation of site contamination. This should be in the form of a preliminary site investigation (PSI) and, if considered necessary, a detailed site investigation (DSI), undertaken in accordance with *National Environment Protection (Assessment of Site Contamination) 1999* ("the ASC NEPM"), the PFAS National Environmental Management Plan 2.0 (as amended from time to time) (PFAS NEMP), and the National Water Quality Management Strategy (NWQMS). The assessments should include but not be limited to: • Site history, physical setting, and site conditions. • A conceptual site model (CSM) regarding contamination sources, receptors and exposure pathways between those sources and receptors. • Characterisation of chemical contamination at the area of the proposed action. • Analytical results of laboratory analysis should also be provided in an ESdat compatible format. Information and data regarding the proposed works, with emphasis on those with the potential to disturb and/or remobilise contamination. This should include, but not be limited to, the following: • The locations and depths of any earthworks, including whether groundwater is expected to be intersected. • The expected volumes of potential contaminated materials, if any, to be produced including soil, water and hardstand material, and the fate of such material. • The expected duration of excavations / bare earth being exposed. • Assessment of environmental suitability of any fill material proposed to be imported onto the site. Mitigation measures and management protocols proposed to be implemented to protect the environment during the proposed action. This should include, but not be limited to, the following: • Measures to prevent and / or manage any potential for mobilisation of PFAS and other contaminants. • Known / likely trenching operations, stockpile sites, laydown / cleared areas, access areas, disturbed soil areas, etc. • A commitment to ensuring that the vehicle hygiene, risk-based management, on-site stockpiling, storage and containment, transport of PFAS contaminated materials is consistent with the guidance in the PFAS NEMP 2.0 (HEPA 2020: 46-60), as updated from time to time.	**5.2.10**

Item	Information Required	Section in this Document
	Further, consideration could be given to the need for: • A Construction Environmental Management Plan (CEMP), including an unexpected finds protocol (UFP). • Airport Environment Officer (AEO) review of Melbourne Airport's PFAS Management Framework.	
	Cumulative Impacts	
3.3.1	Review and analysis of residual impacts of the proposed action, and of other known proposals within the larger Melbourne Airport site.	**5.3**
3.3.2	Consideration of the potential for cumulative impacts on the resilience of any threatened species and ecological communities in the airport, and on overall habitat quality and availability.	**5.3**
3.3.3	Discussion of the potential for existing pressures and threats to be exacerbated by the project.	**5.3**
	Avoidance, Mitigation and Management Measures	
4.1	A detailed summary of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of the proposed action. This should include for each measure: • A statement of the objectives, ongoing management and monitoring, locations and timing • The party responsible. • The policy basis, for instance, consideration of the *PFAS National Environment Management Plan 2.0.*	**6.0**
4.2	The proposed measures must be based on best available practices, appropriate standards, evidence of success for other similar actions and supported by published scientific evidence.	**6.0**
4.3	All proposed measures to manage impacts must be drafted to meet the 'S.M.A.R.T' principle: S – Specific (what and how). M – Measurable (baseline information, number/value, auditable). A – Achievable (timeframe, money, personnel). R – Relevant (conservation advice, recovery plans, threat abatement plans). T – Time-bound (specific timeframe to complete).	**6.0**
4.4	The details of the vegetation and species habitat to be retained and an associated map showing the retained vegetation and habitat. The information and mapping must include the location and quantification of the total area of retained vegetation and species habitat when acting in combination with past, present, and reasonably foreseeable projects at the Airport.	**6.2** **6.3** **Figure 4**
	Offsets	
5.1	An assessment of the likelihood of residual significant impacts occurring on relevant MNES, after avoidance, mitigation and management measures have been applied.	**7.0**
5.2	If residual impacts are likely to be significant, please provide details of an offset strategy proposed to be implemented to compensate for the residual significant impacts of the project.	**7.0**
5.3	Where offset area/s have been nominated to compensate for the residual significant impacts, provide an Offset Management Plan (OMP) as an appendix to the PD. You may wish to propose an advanced offset for the project plus the cumulative impacts of reasonably foreseeable projects across the airport. The OMP must meet the information requirements set out in Appendix B, and must be prepared by a suitably qualified ecologist and in accordance with the department's *Environmental Management Plan Guidelines* (2024), available at: www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines.	**7.0**

Item	Information Required	Section in this Document
	Ecologically Sustainable Development (ESD)	
6.1	A description of how the proposed action meets the principles of ESD, as defined in section 3A of the EPBC Act. The following principles are ***principles of ecologically sustainable development***: • decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations. • 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 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 conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making. • improved valuation, pricing and incentive mechanisms should be promoted.	**8.0**
	Economic and Social Matters	
7.1	An analysis of the economic and social impacts of the action, both positive and negative.	**3.1** **9.1**
7.2	Details of any public consultation activities undertaken and their outcomes.	**9.2.1**
7.3	Details of any consultation with Indigenous stakeholders. **Indigenous engagement** Identify existing or potential native title rights and interests, including any areas and objects that are of particular significance to Indigenous peoples and communities, possibly impacted by the proposed action and the potential for managing those impacts. Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. The department considers that best practice consultation, in accordance with the Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999 (dcceew.gov.au) includes: • Identifying and acknowledging all relevant affected Indigenous peoples and communities. • Committing to early engagement. • Building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management. • Setting appropriate timeframes for consultation; and • Demonstrating cultural awareness. Describe any state requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regards to Indigenous peoples and communities.	**9.2.2**
7.4	Projected economic costs and benefits of the project, including the basis for their estimate through cost/benefit analysis or similar studies.	**9.3**
7.5	Employment opportunities expected to be generated by the project (including construction and operational phases).	**9.4**

Item	Information Required	Section in this Document
	Environmental Record of the Person Proposing to Take the Action	
8.1	Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:	
8.1.1	• The person proposing to take the action;	**10.0**
8.1.2	• For an action for which a person has applied for a permit, the person making the application;	**10.0**
8.1.3	• If the person is a body corporate—the history of its executive officers in relation to environmental matters; and	**10.0**
8.1.4	• If the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers.	**10.0**
	Conclusion	
9.1	Please provide an overall conclusion as to the environmental acceptability of the proposal with regards to the objects and requirements of the EPBC Act including the principles of Ecologically Sustainable Development (ESD). You may wish to include a statement as to whether or not the controlled action should be approved and may recommend conditions pertaining to an approval. This should include justification for undertaking the proposed action in the manner proposed.	**11.0**

2.0 Regulatory Framework

Melbourne Airport is located on Commonwealth land and as such is subject to Commonwealth legislation, primarily the *Airports Act 1996* (Airports Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The relevant regulatory requirements, planning framework and policy documents for the proposed action are outlined below.

2.1 Airports Act

The Airports Act is administered by the Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts (DITRDCSA) and is the primary piece of Commonwealth legislation applicable to Melbourne Airport.

Section 89(1) of the Airports Act classifies certain types of airport development as 'major airport developments' for which an airport lessee company is required to seek approval through a Major Development Plan (MDP). These developments include:

> *(m) a development of a kind that is likely to have significant environmental or ecological impact; or*
>
> *(n) a development which affects an area identified as environmentally significant in the environment strategy;*

Section 98(1) of the Airports Act sets out certain building activities which must not be carried out unless an approval has been obtained under the *Airports (Building Control) Regulations 1996*. These activities include:

> *(a) constructing buildings or other structures; […]*
>
> *(c) undertaking, constructing or altering earthworks (whether or not in relation to buildings or other structures);*
>
> *(d) undertaking, constructing or altering engineering works, electrical works or hydraulic works (whether or not in relation to buildings or other structures); […]*
>
> *(f) undertaking land clearing;*

The relevant requirements of the *Airports (Building Control) Regulations 1996* are discussed further in **Section 2.1.1**.

2.1.1 Airports (Building Control) Regulations 1996

The project is subject to airport lessee consent from APAM and a building approval from the appointed Airport Building Controller (ABC) as required under the *Airports (Building Control) Regulations 1996*. The building approval cannot be issued by the ABC without written consent from APAM, confirming that the project is consistent with:

- Melbourne Airport Master Plan 2022;
- Airport Environment Strategy; and
- Planning objectives for the Melbourne Airport.

2.1.2 Airports (Environment Protection) Regulations 1997

The *Airports (Environment Protection) Regulations 1997* cover the full range of airport environmental management matters. While an approval is not required for the project under these regulations, they impose obligations relating to the management of the environment across the airport site and require assessment, monitoring and reporting in relation to biodiversity, heritage, air, water and soil pollution, and noise levels.

2.1.3 Melbourne Airport Master Plan

In line with the Airports Act, APAM must submit a draft master plan to the Commonwealth Minister for Infrastructure, Transport, Regional Development, Communications, Sport and the Arts for approval every five years. The purpose of the master plan is to provide detailed plans for the continued development of the airport over the next five years. These plans must align with the Master Plan's 20-year strategic direction for the airport that considers the changes needed to aviation facilities, ground transport, utilities infrastructure, non-aviation development and environmental measures.

The current Melbourne Airport Master Plan 2022 (APAM, 2022) sets out land use requirements for the different precincts across the airport. In particular, for the Landside Business Precinct and the Activity Centre Zone (where the project is located), the following objectives are of relevance to the project:

- To provide for non-aviation uses including industrial, commercial, retail, office, recreational, manufacturing, warehousing and associated activities.
- To provide for ground transport facilities and services for efficient access to the airport, including Melbourne Airport Rail.
- To advance Melbourne Airport as one of the state's key activity centres and transport gateways.
- To provide for the long-term and sustainable growth of Melbourne Airport.
- To encourage a mix of uses and the development of the Activity Centre Zone:
  - As a focus for airport activities, complementary business, commercial and shopping activities, working, travellers' accommodation, leisure, transport and community facilities.
  - To support sustainable urban outcomes that optimise the use of infrastructure.
- To create an attractive, pleasant, safe, secure and stimulating environment through good urban design.
- To facilitate the use and development of land in accordance with the Melbourne Airport Framework Plan (Land Use Precincts Plan and Zoning Plan).

The Melbourne Airport Master Plan 2022 also includes the current Airport Environment Strategy, which identifies environmental objectives and targets to be achieved alongside implementation of the airport development plan. These objectives and targets have been taken into account when conducting relevant environmental assessments for the project and identifying suitable mitigation measures.

2.2 EPBC Act

The EPBC Act includes triggers for formal assessment associated with impacts to Matters of National Environmental Significance (MNES) and actions on, or impacting upon, Commonwealth land. On the basis of potential for significant impacts on MNES, APAM submitted an EPBC referral application (EPBC 2023/09633) in relation to the proposed action on 24 August 2023.

On 14 November 2023, the delegate of the Minister for the Environment determined that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- Listed threatened species and communities (section 18 and section 18A); and
- Commonwealth land (sections 26 and section 27A).

It was determined that the proposed action is a controlled action to be assessed by PD.

3.0 Description of the Action

3.1 Project Need

All Melbourne Airport developments are based on a robust and flexible framework in accordance with the Melbourne Airport Master Plan 2022. Melbourne Airport's development footprint and associated safeguarding of the long-term concept plan are strongly influenced by the growth of the airport, the need for increased operational and logistical capacity, and the objective to achieve and retain the highest standards of quality, sustainability, safety, and security.

The project is part of the continued non-aviation development required to support the airport's economic versatility and complement its key aviation functions, and it is located on the southern side of the Landside Business Precinct of Melbourne Airport. The precinct is zoned as an Activity Centre Zone providing for complementary industrial, commercial, retail, office, recreational, manufacturing, warehousing and associated activities on land not required for aviation uses - in accordance with the Airports Act and the Melbourne Airport Master Plan 2022.

The project is complementary to other activities and facilities within and near the Landside Business Precinct, making good use of available infrastructure. Its location and design is such that freight movements and other commercial traffic will benefit from the road network connectivity, providing access to facilities in both airside and landside of the airport. In this regard, the project is consistent with the Melbourne Airport Master Plan 2022 and is required in order to support Melbourne Airport to advance as one the State's key activity centres and transport gateways, provide for the long-term and sustainable growth of the airport, and facilitate ground transport facilities and services for efficient access to the airport.

3.2 Project Description

The project is referred to as the MABP – Sky Road West Warehouses. It involves developing land within the MABP, west of the existing Sky Road area to construct large manufacturing, logistics and industrial warehouse units that will provide industrial and office facilities for aviation and non-aviation uses, in line with the Melbourne Airport Master Plan 2022 objectives.

APAM has previously been granted an EPBC Act Part 13 Permit (E2022-0207) for works relating to the development of land for warehousing and the extension of Sky Road to the west, which will open up the warehouse lots that are subject to the proposed action. Noting that the area related to the Part 13 Permit (E2022-0207) is located within the current proposed project area, the proposed action will occur subsequent to the action approved under the existing Permit.

Project timing will depend on the market and tenant requirements – held for pre-leased warehouses. It is expected that all warehouses covered by the project will be delivered over the next five years. **Figure 1** shows the land subject to this project and **Figure 2** shows the developable land in the Business Park as included in the Melbourne Airport Master Plan 2022. This map provides the location and type of land use, key infrastructure in terms of lots and warehouse sizes (i.e. Plot 10 – 13, 15-A and 15-B) and drainage plan. Built area of the sites will generally achieve 50% site coverage, including warehouse and office, with the remaining area to be hardstand for heavy vehicles and storage, carparking, and landscaping.

Proposed construction activities will vary slightly depending on the topography of each project site, and will generally require cut and fill works, including imported fill to bring to the required finished floor level to align with existing infrastructure. Earthworks will be managed by APAM contractors via an approved Construction Environmental Management Plan (CEMP). No road surfacing works will be required to external roads as the existing road (i.e. Sky Road West) is already asphalted. The proposed construction activities associated with each stage (pre-construction, construction and operations) are summarised in **Section 3.2.1**, **Section 3.2.2** and **Section 3.2.3**.

The project area comprises approximately 24 hectares (ha) and supports 3.32 ha of NTGVVP. The proposed disturbance footprint (including earthworks, site access and laydown areas) will comprise the entirety of the project area.

Figure 3 shows the location of the project, proposed project footprint, and key existing infrastructure and stormwater management within and adjacent to the project area. **Figure 4** shows the location of ecological values across the entirety of the Melbourne Airport estate.

3.2.1 Pre-construction

The selected contractor will look to establish their site compound and work laydown areas as part of their pre-construction activities. The location of the site compound is still to be determined but will be located within the project area. Access to this location will be via the internal airport road network.

Before commencing construction works, the project area boundary will be established and it will be clearly communicated to all personnel working on the project that areas beyond the project area boundary are a “No-go Zone.” No works will be permitted in these areas to prevent unintended impacts to native vegetation and other potential sensitive receptors located outside of the project area.

3.2.2 Construction

During construction, the following activities will be undertaken:

- Vegetation clearing and grubbing, including removal of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP).
- Excavation of topsoil and upper natural soil profile as part of preparatory works.
- Subgrade and pavement preparation works.
- Construction of large manufacturing, logistics and industrial warehouse units.
- Construction of internal road network (roads internal to each lot boundary) and upgrades / connection to existing road network.
- Installation of supporting utility services (i.e. communications, electrical, stormwater).

The design plans for earthworks, warehouse units, road network upgrades and surface water management will be developed by APAM contractors.

Overall, standard methodology and plant / equipment for construction of industrial / commercial parks and road construction projects will be implemented / used including excavators, graders, rollers, and truck and trailers. Services will be installed via open cut trenches.

All works will be completed in accordance with the minimum environmental requirements of the Melbourne Airport Environmental Management Plan (Sep 2021).

Equipment and vehicles will be cleaned and freed of foreign material (e.g. weed propagules or material containing pathogens) prior to leaving the project area.

Excavation techniques to be used during construction include:

- Excavation of soil, subgrade and former asphalt using various excavator sizes.
- Trenching using a excavators.
- Non-destructive digging via water jetting.
- Pavement coring via attachment on a skid-steer.

Any excavated material requiring on-site stockpiling will occur within defined areas away from vegetation to be protected, waterways, catch drains and heritage places to minimise impacts to sensitive receptors. Topsoil and subgrade soils will be managed separately to maximise potential future reuse. Any material that is surplus to requirements will be transported to a temporary per- and polyfluoroalkyl substances (PFAS) Storage Facility or other temporary stockpile locations via truck for future on-site reuse with the Melbourne Airport estate in accordance with Melbourne Airport's PFAS Management Framework and the PFAS National Environmental Management Plan (PFAS NEMP) Version 3.1 (HEPA 2025).

Sediment and erosion controls will be implemented, including installation of silt fencing and stockpile management controls.

Each lot within the project area will manage its own surface water and drainage connected to a single legal point of discharge discharging back into existing stormwater infrastructure within the MABP.

The project area is subject to a Cultural Heritage Management Plan (CHMP 12498) approved by the Registered Aboriginal Party (RAP). CHMP 12498 outlines the requirements and conditions to manage and mitigate potential impacts to a Registered Aboriginal place (Victorian Aboriginal Heritage Register, VAHR 7822-1333 Melbourne Airport 1) recorded within the south-west corner of the project area. Construction works will be conducted in accordance with the relevant CHMP 12498 requirements and conditions. The CHMP 12498 will not be made publicly available due to cultural sensitivity reasons.

A project-specific CEMP will be prepared for each warehouse and will detail the environmental measures to be implemented during delivery of the project, including soil, water, flora and fauna, vegetation, heritage and waste management measures, emergency response procedures, and environmental induction and training requirements to prevent and minimise environmental impacts and protect the surrounding land from potential impacts associated with the project. The CEMP must meet Melbourne Airport's minimum requirements, as outlined in the Melbourne Airport Master Plan 2022 and the Melbourne Airport Environmental Management Plan (2021) and must be approved by the APAM Environment and Sustainability Team and reviewed by the Airport Environment Officer before commencement of the project.

3.2.3 Operations and Maintenance

Following completion of each warehouse, operational and maintenance works would be limited to the project area and includes general repair and maintenance of roads, drainage, grass and fences to be implemented by APAM tenants and contractors.

4.0 Habitat Assessments

4.1 Habitat Assessment

The project area consists of vegetation that is highly modified due to previous land clearing and current land management including cattle grazing and intensive mowing/slashing. Patches of native vegetation persist and are dominated by native grasses. A vegetated swale (Steele Creek) runs down the eastern boundary of the project area and culminates in a retarding and biofiltration basin, before leaving the airport estate.

Considering the ecological values within the project area and surrounds, and utilising the EPBC Protected Matters Search Tool (DCCEEW 2024a) (**Appendix C**), habitat assessments, vegetation assessments and targeted ecological investigations undertaken by Biosis between 2022 and 2025 were reviewed to assess the presence and extent of listed threatened species habitat and threatened ecological communities within the project area.

4.1.1 Threatened Ecological Communities

Four listed threatened ecological communities were identified as potentially occurring within the search area (search was undertaken with a two km buffer). Vegetation assessments were undertaken by Biosis in December 2022 (Biosis 2023) (**Appendix C**) and in December 2025 (Biosis 2026a) (**Appendix G**) to identify and assess the occurrence of NTGVVP within the project area. The 2025 assessment included additional field verification and vegetation quality assessments within the northern portion of the project area and refined the mapping and delineation of NTGVVP. The updated assessment incorporated vegetation quality assessments and application of the relevant key diagnostic characteristics and condition thresholds for NTGVVP, refining the extent of the ecological community identified within the project area. The assessments identified patches that met the criteria of NTGVVP, totalling 4.09 ha within the project area. The ecological community is primarily associated with remnant Plains Grassland (Ecological Vegetation Class - EVC 132) vegetation occurring within undeveloped portions of the project area. The findings of the updated assessment have been incorporated into this PD and form the basis of the impact assessment presented in **Section 5.1.4** and the offset strategy described in **Section 7.0**.

No other listed threatened ecological communities were identified within the project area during the surveys.

4.1.2 Threatened Species

A total of 44 listed threatened species were identified in the search as potentially occurring within the project area (and/or within one km of the project area). Habitat assessments undertaken by Biosis in 2022 and 2025 identified that the project area contains native grassland vegetation and other habitat features that may provide habitat for a subset of these species. Based on the ecological values (native grasses) present within the project area and the known habitat requirements of listed species, potential habitat was identified for the following species.

4.1.2.1 Golden Sun Moth

Potential habitat for the Golden Sun Moth (GSM) includes, and it is not limited to, NTGVVP (Commonwealth of Australia 2009). The species has been recorded outside the project area, including at Woodlands Historic Park to the north and east and along the Moonee Ponds Creek corridor to the east. Potential GSM habitat within the project area is associated with grassy vegetation supporting suitable larval food plants, including Spear Grasses (*Austrostipa* spp.), Wallaby Grasses (*Rytidosperma* spp.), and the introduced Chilean Needle-grass (*Nassella neesiana*) and Serrated Tussock (*Nassella trichotoma*) (Biosis 2023, 2025). Although areas of potential habitat occur within the project area, targeted surveys undertaken in November and December 2025 (during the 2025 GSM flight season) did not record the species (Biosis 2026a).

Further information regarding targeted surveys undertaken within the project area is provided in **Appendix G**.

4.1.2.2 Striped Legless Lizard

Potential habitat for the Striped Legless Lizard (SLL) includes areas of native grassland and grassy woodland vegetation (DCCEEW 2024b). Potential SLL habitat is present within the project area and is primarily associated with remnant native grassland vegetation, including areas of Plains Grassland (EVC 132) and NTGVVP. Past targeted surveys have not detected the species within Melbourne Airport, and there are no known database records of the species within a five kilometre (km) radius of the airport, although they have been detected just beyond that radius. Targeted surveys undertaken over spring and summer 2025 by Biosis did not record the species within the project area (Biosis 2026a). While areas of potential habitat occur within the project area, the survey results, together with historical survey effort and the absence of local records, indicate that the species is unlikely to occur within the study area.

Further information regarding targeted surveys undertaken within the project area is provided in **Appendix G**.

4.1.2.3 Victorian Grassland Earless Dragon

The Victorian Grassland Earless Dragon (VGED) (*Tympanocryptis pinguicolla*) is a native grassland species inhabiting natural temperate grasslands (DCCEEW, 2024b). The VGED had been presumed extinct in Victoria, with the last confirmed sighting in 1969, prior to the species being rediscovered in Western Melbourne in 2023 (Biosis 2024).

Only one record has been documented within the vicinity of Melbourne Airport, which occurs approximately 13 km north-west of the project area within the Holden Flora Reserve, south of Sunbury (Biosis, 2024). While this sighting from 1990 is documented in the Victorian Biodiversity Atlas as having an ‘acceptable’ reliability, the Conservation Advice for VGED states that this and four other records remain unvalidated, despite intensive survey effort immediately following the sightings and during subsequent years (DCCEEW 2023). The Conservation Advice also states that further targeted surveys have been undertaken in the Melbourne Airport area and have not detected the species (DCCEEW 2023). The project area overlaps with the modelled distribution for the species (DCCEEW 2024d).

4.1.2.4 Growling Grass Frog

The Growling Grass Frog (GGF) is dependent upon permanent freshwater lagoons for breeding. Refuge habitat includes soil cracks, fallen timber, debris and dense vegetation on low, frequently inundated floodplains (DCCEEW 2024b).

The GGF has been recorded in the broader Melbourne Airport area, including Arundel Creek, Moonee Ponds Creek, Deep Creek and the Maribyrnong River. Breeding, aquatic and terrestrial habitat for the species has been previously identified in parts of the Melbourne Airport estate (Biosis 2023). An updated habitat assessment undertaken by Biosis in December 2025 identified limited potential habitat for GGF within the project area (Biosis 2026a). While the project area contains some vegetation and habitat features that may be utilised by dispersing individuals, it does not contain suitable breeding habitat and is considered unlikely to support a resident population of the species. Targeted surveys undertaken within and adjacent to the project area did not record the species (Biosis 2026a).

Further information regarding the habitat assessment and targeted surveys is provided in **Appendix G**.

4.1.2.5 Other Species

Several bird species were identified in the search (DCCEEW 2024a), though none are expected to make regular or significant use of the area due to lack of suitable habitat resources for many of these species. Some bird species may fly over on occasion as part of broader movements between areas of suitable habitat located in the broader landscape. No impacts on threatened bird species are expected to occur as a result of the proposed action and these species have therefore not been considered further.

There were also several flora species identified in the search (DCCEEW 2024a). The grassland survey did not identify the presence of or habitat for any of these flora species. Therefore, impacts to these species have not been considered further.

4.1.3 Migratory Species

A total of 13 listed migratory species has been recorded or are predicted to occur within the project area (and/or within two km of the project area), though none are expected to make regular or significant use of the area due to its relatively small size and lack of suitable habitat. Furthermore, the project area is unlikely to support an ecologically significant proportion of any migratory species. No impacts on migratory species are expected to occur as a result of the proposed action and these species have therefore not been considered further.

4.1.3.1 Summary of Habitat Assessments and Targeted Surveys for Threatened Species

Species considered to occur within the project area have been assessed through a range of ecological investigations undertaken at Melbourne Airport. These include a range of ecological investigations undertaken at Melbourne Airport over the past two decades, including habitat assessments, targeted surveys and broader ecological studies. Ecological consultants have monitored and continue to monitor and assess Melbourne Airport's flora and fauna, both terrestrial and aquatic. As a result, a number of surveys have been carried out in the project area and surrounds. The following surveys have been undertaken and have informed the assessment of the presence of MNES in the project area:

- *Habitat Assessment and Presence of Synemon plana (Golden Sun Moth) – Melbourne Airport, Tullamarine*, January 2008 (Gagin 2008).
- *Second Report - Presence of the Golden Sun Moth Synemon plana – Melbourne Airport,* January 2009 (Gagin 2009).
- *Survey for the Presence of the Golden Sun Moth Synemon plana – Melbourne Airport, Tullamarine*, February 2010 (Gagin 2010).
- *Melbourne Airport, Tullamarine: Targeted Golden Sun Moth Survey*, January 2013 (Brett Lane & Associates 2013).
- *Grassland mapping at Sky Road West*, Melbourne Airport, 1 February 2023 (Biosis 2023) (**Appendix C**).
- *Melbourne Airport's Third Runway Project Ecology Technical Report,* 31 March 2023 (Biosis, 2023).
- *Sky Road Business Park – Victorian Grassland Earless Dragon Tympanocryptis pinguicolla habitat assessment, July 2024* (Biosis 2024) (**Appendix D**).
- *Sky Road West Preliminary Documentation: Targeted survey results*, 7 May 2026 (Biosis 2026a) (**Appendix G**). This includes targeted surveys for Golden Sun Moth (GSM), Striped Legless Lizard (SLL) and Growling Grass Frog (GGF), and an updated vegetation assessment for the northern portion of the project area.

The proposed Melbourne Airport's Third Runway (M3R) project involved thorough ecological assessments to inform the project's MDP. These assessments documented the ecological values present within the majority of the Melbourne Airport area, including areas in the MABP adjacent to the project area.

Figure 4 shows the EPBC listed species habitat based on previous assessments at Melbourne Airport.

4.1.4 Golden Sun Moth

Several targeted surveys for GSM have been undertaken in the previous 15 years at Melbourne Airport, including airport-wide investigations undertaken as part of the Melbourne Airport Third Runway (M3R) project (Biosis 2023). Only one of the targeted survey programs confirmed the presence of GSM within the broader Melbourne Airport estate. This is in the northern portion of the estate, over four km away from the project area. This GSM habitat identified is bounded by Sunbury Road to the north and the Grey Box Woodland to the south, east and west. The north-west of the GSM habitat is bounded by a pasture improved paddock. Given the absence of records within the project area and surrounding areas, the considerable distance from the nearest known population, the lack of habitat connectivity between known habitat and the project area, and the limited dispersal capability of female GSM (DAWE 2021), it is considered unlikely that a population of GSM occurs within the project area or adjacent areas.

4.1.5 Striped Legless Lizard

Several targeted surveys for SLL have been undertaken in the previous 15 years at Melbourne Airport, including airport-wide investigations undertaken as part of the M3R project (Biosis 2023). In addition, targeted surveys for SLL were undertaken within the project area over spring and summer 2025 (Biosis 2026a) (**Appendix G**). SLL was not detected within the project area during targeted surveys, despite the substantial survey effort within suitable habitat during the period when known nearby populations were observed to be active. The 2025 survey results are consistent with previous investigations across Melbourne Airport, which have not recorded the species despite substantial survey effort within suitable habitat. There has been a substantial survey effort for SLL at Melbourne Airport as can be seen in **Figure 6**. A total of 62 tile grids and 52 pit fall traps have been surveyed over approximately 840 ha of potential habitat to date with no record of the species being detected. It is therefore considered unlikely that the species is present within the project area.

With records of the species occurring within five km south of Melbourne Airport, and more recently recorded within five km north of Melbourne Airport (Biosis, 2020 - unpublished), it is probable that potential habitat at Melbourne Airport would have once been colonised by the species. It is possible that the bulk earth works required to establish both the airfield and MABP at Melbourne Airport has rendered that particular area unsuitable for the species. It is also possible that the long history of the land utilised for farming purposes including pasture improvement, cropping, stocking, and recently small block farming (Barbiston Road area) have caused a local extinction of the species in the area, or even that the species was never historically present within the area. Based on the absence of records from historical and recent targeted surveys, SLL is considered unlikely to occur within the project area or adjacent areas.

4.1.6 Growling Grass Frog

Several targeted surveys for GGF have been undertaken in the previous 15 years at Melbourne Airport, including airport-wide investigations undertaken as part of the M3R project (Biosis 2023).

Waterways and adjacent farm dams, quarries and drainage lines have been assessed for habitat values for GGF. **Figure 7** shows previous survey efforts for GGF. An updated habitat assessment undertaken in December 2025 confirmed that there is no suitable breeding habitat for GGF within the project area (Biosis 2026a) (**Appendix G**).

Some drainage lines across the Melbourne Airport estate had been mapped as ‘Potential dispersal and ephemeral aquatic habitat’. Impacts to these areas had been considered for the possibility for indirect impacts to GGF further downstream (i.e. as the result of sedimentation and altered hydrology). This included Steele Creek immediately east of the project area, and an area within the project area that previously was a swale connecting to Steele Creek. This swale has since been filled in so there is no longer any potential GGF habitat within the project area. Steele Creek is an artificial swale which leads to a retarding basin and biofiltration basin that represents low quality potential dispersal and ephemeral aquatic habitat for GGF. The 2025 targeted surveys undertaken within and adjacent to the project area did not record GGF (Biosis 2026a) (**Appendix G**). Based on the absence of suitable breeding habitat and the results of previous and recent targeted surveys, GGF is considered unlikely to occur within the project area.

4.1.7 Victorian Grassland Earless Dragon

A habitat assessment for the Critically Endangered VGED was undertaken by Biosis, including a site survey in May 2024 (**Appendix D**). The assessment concluded that a population of VGED is unlikely to persist within the study area due to the evidence of historical ploughing, ongoing disturbance (intensive cattle grazing and surrounding road and industrial development), lack of appropriate refugia and high cover of weeds.

4.2 Review of Adequacy of Surveys

The survey methods adopted to identify and assess threatened ecological communities and listed threatened species within the proposed action area (i.e. the project area) are considered sufficient to ensure all species with potential to occur within the project area were considered.

The assessment of the presence of, and potential impacts on, NTGVVP and the VGED was informed by recent field-based assessments of the project area (Biosis 2023, 2024). An updated vegetation assessment undertaken in December 2025 further refined the mapping and condition assessment of NTGVVP within the project area (Biosis 2026a) (**Appendix G**). The assessment of potential presence for GSM, SLL and GGF was informed by targeted surveys undertaken within the project area during 2025 (Biosis 2026a) (**Appendix G**), together with previous survey effort, habitat assessments, land management history, disturbance history and broader ecological investigations undertaken across Melbourne Airport estate.

In summary, the assessment of the potential for EPBC Act-listed species and ecological communities to occur within the project area has drawn from a broad range of information, including targeted surveys undertaken within the project area, previous surveys completed across Melbourne Airport, habitat assessments, current and historical land management, disturbance history, and species ecology and dispersal characteristics. Collectively, this information provides a robust basis for assessing the likelihood of occurrence of listed threatened species and ecological communities within the project area and the potential impacts associated with the proposed action.

4.2.1 Vegetation

Vegetation assessments were undertaken by Biosis in December 2022 (**Appendix C**) and December 2025 (**Appendix G**) to establish the presence, extent and condition of the NTGVVP ecological community within the project area. Vegetation within the study area was assessed and mapped by experienced botanists, with the 2025 assessment including additional field verification and vegetation quality assessments within the northern portion of the project area. Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01). Patches of native vegetation were identified and classified under the Guidelines as an area of native vegetation, with or without trees, where at least 25% of the total perennial understorey cover is native plants. An EVC was then assigned to each patch of native vegetation.

Patches of Plains Grassland (EVC 132) were assessed against the key diagnostic characteristics and condition thresholds for NTGVVP as described in the ecological community listing advice (DCCEEW 2008). The *Description* and *Condition Thresholds* contained within the listing advice provide the basis for identifying patches of the ecological community. Following the 2025 assessment, which refined the mapping and delineation of NTGVVP within the northern portion of the project area, NTGVVP is confirmed to comprise 4.09 ha within the project area.

The vegetation assessments undertaken in 2022 and 2025 are considered sufficient to accurately identify, map and assess the condition of NTGVVP within the project area and provide an adequate basis for assessing potential impacts to the ecological community.

4.2.2 Fauna

Previous fauna surveys undertaken at the airport were reviewed and additional targeted surveys for GSM, SLL and GGF were undertaken in 2025 (Biosis 2026a) (**Appendix G**), while a dedicated habitat assessment for VGED was completed in 2024 (Biosis 2024) (**Appendix D**). The targeted fauna surveys and habitat assessments undertaken were completed in accordance and consultation with the following guidance:

- GSM surveys were undertaken during GSM flight season under appropriate weather conditions as set out in the survey guidelines within the *Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)* (DEWHA 2009a).
- GGF surveys were undertaken in accordance with the survey protocols described in the *Survey guidelines for Australia's threatened frogs – Guidelines for detecting frogs listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2010).
- SLL surveys were undertaken using the artificial shelter (tile surveys) technique in accordance with *Survey guidelines for Australia's threatened reptiles* (DSEWPaC 2011).
- VGED habitat assessments were undertaken considering the *Draft National Recovery Plan for Four Grassland Earless Dragons (Tympanocryptis spp.) of Southeast Australia* (DCCEEW 2023).

The project area and broader Melbourne Airport estate have been subject to numerous ecological assessments over the past 15 years, including targeted surveys for GSM undertaken by Biosis and Gagin. Gagin undertook surveys for GSM from 2007 to 2010 across suitable grassland habitat located on Melbourne Airport land to the south of the active airfield, including areas within and adjacent to the project area, with no GSM recorded (Gagin 2008, 2009, 2010). Biosis subsequently conducted targeted GSM surveys across substantial portions of the Melbourne Airport estate in 2013, 2014 and 2019. No GSM were not recorded during surveys in 2013 and 2014. A small number of male GSM was recorded in 2019 within the northern section of the Melbourne Airport estate, more than four km from the project area. No GSMs were recorded within the central or southern portions of Melbourne Airport estate, which are closer to the project area. Targeted surveys undertaken within the project area during the 2025 GSM flight season were consistent with previous investigations and provided further confidence in the conclusion that GSM is unlikely to occur within the project area (Biosis 2026a) (**Appendix G**).

Similarly, a substantial survey effort has been undertaken within the broader Melbourne Airport estate for SLL. Previous targeted surveys undertaken within suitable grassland habitat at Melbourne Airport estate did not record the species. More broadly, a total of 62 tile grids and 52 pitfall traps have been surveyed over approximately 840 ha of potential habitat with no records of SLL (Biosis 2023). Additional targeted surveys were undertaken within the project area in 2025, comprising eight artificial shelter (tile) arrays deployed within areas of potentially suitable habitat and inspected over ten survey occasions between September and December 2025 (Biosis 2026a) (**Appendix G**). The survey effort undertaken in 2025 was consistent with relevant Commonwealth survey guidelines and provides additional confidence in the conclusion that SLL is unlikely to occur within the project area (Biosis 2026a) (**Appendix G**).

Targeted surveys for GGF were undertaken within and adjacent to the project area during 2025 in accordance with the relevant Commonwealth survey guidelines (Biosis 2026a) (**Appendix G**). The surveys confirmed the absence of suitable breeding habitat within the project area and did not identify evidence indicating the presence of a resident population. These findings are consistent with previous assessments undertaken across Melbourne Airport estate, which concluded that the project area is unlikely to support the species.

The potential occurrence of VGED within the project area was assessed through a dedicated habitat assessment undertaken by Biosis in 2024 (Biosis 2024) (**Appendix D**). The assessment was completed having regard to the *Draft National Recovery Plan for Four Grassland Earless Dragons (Tympanocryptis spp.) of Southeast Australia* (DCCEEW 2023) and considered vegetation composition, habitat structure, disturbance history and landscape context. The assessment concluded that the project area was unlikely to support suitable habitat for VGED and, consequently, targeted surveys were not considered necessary. The habitat assessment was considered sufficient to assess the likelihood of occurrence of the species within the project area.

Collectively, the historical and recent survey effort undertaken within the project area and broader Melbourne Airport estate, together with targeted habitat assessments and species-specific investigations, provides an adequate basis for assessing the likelihood of occurrence of listed threatened species within the project area. The available information supports the conclusion that GSM, SLL and GGF are unlikely to occur within the project area or immediate surrounds, while the dedicated habitat assessment undertaken for VGED concluded that the project area is unlikely to support suitable habitat for the species.

4.2.2.1 Land Management and Disturbance History

In addition to the previous survey work undertaken, past land management and disturbance were also considered in the assessment of the likelihood of threatened fauna being present within the project area, and knowledge on species capacity to colonise areas of suitable habitat. The broader Melbourne Airport area has been subject to extensive historical disturbance associated with the construction of a level airfield and related infrastructure. This would have resulted in the removal of topsoil from areas immediately adjacent to existing airport infrastructure.

Biosis undertook a habitat assessment of the project area in 2024 to assess the potential presence of VGED. The habitat assessment noted that grassland habitat within the project area has been subjected to significant previous disturbance including ploughing, de-rocking, intensive cattle grazing and disturbance from adjacent development activities (Biosis 2024) (**Appendix D**).

Some patches of native grassland vegetation occur in areas that have been subject to previous soil disturbance and are dominated by colonising species, such as Wallaby Grasses *Rytidosperma* spp. Consequently, these areas of native grassland have been previously assessed by Biosis as secondary. They have also been assessed as unlikely to support threatened flora and fauna species (Biosis 2023).

The use of any broad-scale insecticide, which is often used for airfield management, would also not be consistent with GSM persisting. This is also relevant to SLL and VGED, which feed on a diverse range of invertebrates. Previous assessments by both Gagin (2008) and Biosis (2024) have made anecdotal observations on the lack of insect diversity present within this area of the Melbourne Airport estate, which further supports the conclusion that these threatened species are unlikely to be persisting within the project area.

The findings of the 2024 and 2025 habitat assessments and targeted surveys are consistent with this disturbance history and support the conclusions regarding species likelihood of occurrence presented above.

4.2.2.2 Dispersal

While the project area supports areas of native and secondary grassland vegetation with some habitat characteristics suitable for GSM and SLL, the potential for recent colonisation by either species is considered low. This conclusion is supported by the absence of records from both historical and recent targeted surveys undertaken within the project area and broader Melbourne Airport estate, the considerable distance to known populations, the limited dispersal capability of GSM (DAWE 2021), and the fragmented nature of the surrounding landscape. As discussed in **Section 4.3**, the project area is separated from larger areas of native vegetation and known populations by existing airport infrastructure, roads and developed land, reducing the likelihood of natural recolonisation and persistence of these species within the project area.

4.3 Landscape Context

The Melbourne Airport estate is located in Melbourne's northern suburbs. Native vegetation has been cleared or become degraded on most land within five km of the airport area, either due to agricultural activities – mostly livestock grazing – or industrial and residential development.

Nearby waterways – Arundel Creek and Steele Creek – provide the most intact dispersal corridors for fauna. The largest and most intact areas of native vegetation, outside the airport area and within the local area, are Maribyrnong Valley Parklands to the south-west and Broadmeadows Valley Park to the east.

Due to continued development, although patches of native vegetation exist, connectivity is limited. The proposed project area is constrained by existing development to the north, east and south. The area to the west is designated in the Melbourne Airport Master Plan 2022 as a conservation area, and therefore will be managed in accordance with the environmental strategies and targets developed to maintain and enhance the quality of high value ecological areas.

5.0 Impacts

5.1 Listed Threatened Species and Ecological Communities

5.1.1 General Information on Impacts

The impacts associated with the proposed action are due to the clearing of vegetation. Therefore, the nature and likelihood of impacts are well known, and will not be repeated. There will be direct and permanent impacts to NTGVVP as a result of clearing. Investigations indicate it is unlikely any listed threatened species would use the area as habitat, and therefore direct or indirect impacts on listed threatened species are unlikely.

The identified impacts will occur during the construction period only. The construction of the works is expected to take approximately 5 years.

The proposed action has taken into account relevant conservation advice, recovery plans or threat abatement plans into the significant impact assessment for species identified in the following sections.

5.1.2 Golden Sun Moth (Critically Endangered)

The results from targeted surveys presented in **Section 4.2** indicate that the project area and boundaries do not contain a population of the species. Therefore, it is unlikely that the action will adversely affect habitat critical to the survival of the species and a significant impact is unlikely.

5.1.3 Striped Legless Lizard (Vulnerable)

The results from surveys presented in **Section 4.2** indicate that an important population of SLL is not present in the project area or surrounds. Therefore, the action is unlikely to lead to a long-term decrease in the size of an important population of a species or reduce the area of occupancy of an important population.

5.1.4 NTGVVP (Critically Endangered)

As it has been determined that there is NTGVVP present in the project area, **Table 5-1** includes an assessment on the significance of the impacts associated with the proposed action, in accordance with the Significant Impact Guidelines 1.1 (DoE 2013).

Table 5-1: Significant Impact Assessment for NTGVVP

Significant Impact Criteria	Assessment
Is there a real chance or possibility that the proposed action will:	
Reduce the extent of an ecological community;	**Possible.** All 4.09 ha of NTGVVP in the project area will be cleared as a result of the project and will be directly impacted. Removal of 4.09 ha of NTGVVP from the project area amounts to removal of approximately 0.07% of the estimated remaining extent of this threatened ecological community (TEC), near the eastern limit of the TEC's distribution. Due to the historical decline in the amount of NTGVVP, it is possible that this impact could be considered significant.
Fragment or increase fragmentation of an ecological community;	**Unlikely.** It is estimated that more than 95% of known patches of NTGVVP are less than 10 ha in size, as a result of fragmentation by clearing and modification of the TEC over time (DCCEEW 2008). The project would impact a number of patches of NTGVVP that are each less than 10 ha in size. In the broader context of the Melbourne Airport estate, patches of NTGVVP remain to the north and west of the project area and therefore project is considered unlikely to cause any significant fragmentation of a TEC.

Significant Impact Criteria	Assessment
Adversely affect habitat critical to the survival of an ecological community;	**Unlikely**. No Recovery Plan has been prepared or adopted for this TEC and no critical habitats have been formerly identified by the Australian Government. However, given that less than 2% of the TEC is estimated to still exist, most areas that continue to support the TEC are likely to be considered critical habitat, particularly if those areas support moderate to high quality examples of the TEC. Melbourne Airport supports a broader area of grassland covering approximately 270 ha. Given the broader context, the removal of 4.09 ha is considered unlikely to have a significant impact on the ability of this TEC to persist in the airport or in the broader context.
Modify or destroy abiotic factors necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;	**Unlikely.** Project construction activities are unlikely to result in reduction of groundwater levels, or substantial alteration of surface water drainage patterns that will impact the ecological community's survival.
Cause a substantial change in the species composition of an occurrence of an ecological community, including a decline or loss of functionally important species, for example through regular burning or flora and fauna harvesting;	**Unlikely.** Permanent removal of 4.09 ha of NTGVVP within the project area would be unlikely result in loss of functionally important species from the broader occurrence of the TEC. Project-specific CEMPs will be developed to address weed and pathogen management within the project area.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including but not limited to: • **Assisting invasive species establishment** • **Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community; or**	**Unlikely**. The project-specific CEMPs to be developed for the project will include appropriate weed management measures and No-Go areas to protect remaining vegetation adjacent to the project area. The CEMP will meet minimum requirements of the Melbourne Airport EMP and Melbourne Airport PFAS Management Framework.
Interfere with the recovery of an ecological community.	**Unlikely.** No Recovery Plan has been prepared or adopted for this TEC and therefore recovery priorities have not been formally articulated by the Australian Government. However, the action of clearing this small amount is not considered likely to interfere with the TEC's recovery.

5.1.5 Victorian Grassland Earless Dragon

The results from targeted surveys presented in **Section 4.2** indicate that the project area and boundaries do not contain a population of the species. Therefore, it is unlikely that the action will adversely affect habitat critical to the survival of the species and a significant impact is unlikely.

5.1.6 Growling Grass Frog

The results from surveys presented in **Section 4.2** indicate that an important population of GFF is not present in the project area or surrounds. Therefore, it is unlikely that the action will adversely affect habitat critical to the survival of the species and a significant impact is unlikely.

5.2 Commonwealth Land

As the project area exists on Commonwealth Land, impacts to the environment in accordance with the *Significant Impact Guidelines 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies* (DSEWPaC 2013) have been considered as follows.

5.2.1 Impacts on Landscapes and Soils

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Substantially alter natural landscape features;	**No.** The proposed action is located fully within the MABP, being a highly modified environment which has undergone extensive landscape alteration in the past. The proposed action is adding to the existing warehouse infrastructure and therefore will not substantially alter natural landscape features.
Cause subsidence, instability or substantial erosion, or	**No**. The proposed action is located on flat ground surrounded by existing infrastructure, it is unlikely to cause subsidence, instability or substantial erosion.
Involve medium or large-scale excavation of soil or mineral?	**No**. Although some excavation will be required for the works, no excavation considered as medium or large-scale would be required.

5.2.2 Impacts on Coastal Landscapes and Process

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Alter coastal processes, including wave action, sediment movement or accretion, or water circulation patterns;	**No**. The proposed action is not located within the vicinity of coastal environments and no works within aquatic environments are proposed.
Permanently alter tidal patterns, water flows or water quality in estuaries;	
Reduce biological diversity or change species composition in estuaries, or	
Extract large volumes of sand or substantially destabilise sand dunes?	

5.2.3 Impacts on Ocean Forms, Ocean Processes and Ocean Life

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Reduce biological diversity or change species composition on reefs, seamounts or in other sensitive marine environments;	**No**. The proposed action is not located within the vicinity of coastal environments and no works within aquatic environments are proposed.
Alter water circulation patterns by modification of existing landforms or the addition of artificial reefs or the other large structures	
Substantially damage or modify large areas of the seafloor or ocean habitat, such as sea grass;	
Release oil, fuel or other toxic substances into the marine environment in sufficient quantity to kill larger marine animals or alter ecosystem processes, or	
Release large quantities of sewage or other waste into the marine environment?	

5.2.4 Impacts on Water Resources

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Measurably reduce the quantity, quality or availability of surface or ground water; or	**No**. The proposed action will not include any modification to waterways, flows or groundwater extraction.
Channelise, divert or impound rivers or creeks or substantially alter drainage patterns, or measurably alter water table levels?	**No**. The proposed action will not include diverting or impounding rivers or creeks, altering drainage patterns or altering water table levels.

5.2.5 Pollutants, Chemicals, and Toxic Substances

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Generate smoke, fumes, chemicals, nutrients, or other pollutants which will substantially reduce local air quality or water quality;	**No**. Fumes from vehicles and machinery will be limited and will not exceed normal background levels and will therefore not substantially reduce local air, soil or water quality.
Result in the release, leakage, spillage or explosion of flammable, explosive, toxic, radioactive, carcinogenic, or mutagenic substances, through use, storage, transport, or disposal; or	**No**. Substance use will be limited to fuels for vehicles and equipment. The project-specific CEMPs to be prepared for the project will include appropriate mitigation measures to manage any spills or leaks. The CEMP will meet minimum requirements of the Melbourne Airport EMP.
Increase atmospheric concentrations of gases which will contribute to the greenhouse effect or ozone damage, or substantially disturb contaminated or acid-sulphate soils?	**No.** While soils in the project area are likely to contain low levels of contaminants including PFAS, the scale, intensity and duration of excavation works is not considered to be significant. Spoil management procedures, including specific requirements for the management of PFAS-impacted soils, will be included in the project-specific CEMPs. The project-specific CEMPs will meet minimum requirements of the Melbourne Airport EMP and Melbourne Airport PFAS Management Framework. See **section 5.2.10** for further information regarding PFAS management.

5.2.6 Impacts on Plants

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Involve medium or large-scale native vegetation clearance;	**No**. Commonwealth land at Melbourne Airport is approximately 2,741 ha in size of which 678 ha contains native vegetation of varying qualities and patch sizes. Approximately 436 ha of this native vegetation is Heavier-Soils Plains Grassland & Plains Grassland EVC of which approximately 246 ha is comprised of the NTGVVP ecological community. The project will result in the removal of 8.79 ha of Plains Grassland EVC, of which 4.09 ha is NTGVVP. It is unlikely that this removal of native vegetation would be considered as medium to large scale clearing of native vegetation in the context of the broader landscape.
Involve any clearance of any vegetation containing a listed threatened species which is likely to result in a long-term decline in a population or which threatens the viability of the species;	**No**. No listed threatened plants are present within the impact area and no impacts to listed threatened plant species are expected.

Criteria	Assessment
Introduce potentially invasive species;	**No**. The project-specific CEMPs to be prepared for the project will include vehicle and machinery procedures to address the potential introduction of invasive species. The CEMP will meet minimum requirements of the Melbourne Airport EMP.
Involve the use of chemicals which substantially stunt the growth of native vegetation; or	**No**. There will be no use of chemicals which will impact plants.
Involve large-scale controlled burning or any controlled burning in sensitive areas, including areas which contain listed threatened species?	**No**. The proposed action does not include burning.

5.2.7 Impacts on Animals

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Cause a long-term decrease in, or threaten the viability of, a native animal population or populations, through death, injury or other harm to individuals;	**No**. There is little habitat in the project area for animals, due to the lack of trees and waterways. As discussed in **Section 4.2**, there is no important habitat for listed threatened species under the EPBC Act. The native vegetation may provide potential habitat for other species, including the Tussock Skink that is listed as endangered under the *Flora and Fauna Guarantee Act 1988* in Victoria and has been recorded in the broader Melbourne Airport area (Biosis 2023). However, due to the amount and quality of vegetation to be removed as part of this project in the context of the broader area, it is unlikely that it would cause a long-term decrease or substantially reduce or fragment available habitat for native species.
Displace or substantially limit the movement or dispersal of native animal populations;	
Substantially reduce or fragment available habitat for native species;	
Reduce or fragment available habitat for listed threatened species, which is likely to displace a population, result in a long-term decline in a population, or threaten the viability of the species;	
Introduce exotic species which will substantially reduce habitat or resources for native species; or	**No.** The proposed works will not result in the introduction of exotic fauna species.
Undertake large-scale controlled burning or any controlled burning in areas containing listed threatened species?	**No.** The proposed action does not include burning.

5.2.8 Impacts on People and Communities

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Substantially increase demand for, or reduce the availability of, community services or infrastructure which have direct or indirect impacts on the environment, including water supply, power supply, roads, waste disposal, and housing;	**No.** There are no people or communities that will be adversely affected by the proposed project due to the small scale and nature of the project. Appropriate mitigation measures will be incorporated into the project-specific CEMPs to avoid any impacts to the health of staff working on the project, and the broader community. The CEMP will meet minimum requirements of the Melbourne Airport EMP.
Affect the health, safety, welfare, or quality of life of the members of a community, through factors such as noise, odours, fumes, smoke, or other pollutants;	
Cause physical dislocation of individuals or communities; or	
Substantially change or diminish cultural identity, social organisation, or community resources?	

5.2.9 Impacts on Heritage

Criteria	Assessment
Is there a real chance or possibility that the action will:	
Permanently destroy, remove or alter the fabric of a heritage place?	**No.** No Commonwealth Heritage Places have been identified in or near the project area. The project area has previously been assessed to determine the likelihood of Aboriginal cultural heritage material occurring as part of a Cultural Heritage Management Plan (CHMP 12498). CHMP 12498 was approved by the Wurundjeri Woiwurrung Cultural Heritage Aboriginal Corporation, the Registered Aboriginal Party (RAP) for the area. As part of CHMP 12498, an Aboriginal place (Victorian Aboriginal Heritage Register, VAHR 7822-1333 Melbourne Airport 1) was recorded within the south-west end of the project area (**Figure 9**), was relocated and the extent of the site was redefined. CHMP 12498 includes compliance requirements for the remaining extent of VAHR 7822-1333 which will be complied with prior to any impacts resulting from the project. The remainder of the project area has been identified as previously disturbed with a low likelihood of heritage values.
Involve extension, renovation, or substantial alteration of a heritage place in a manner which is inconsistent with the heritage values of the place?	
Involve the erection of buildings or other structures adjacent to, or within important site lines of a heritage place which are inconsistent with the heritage values of the place?	
Substantially diminish the heritage value of a heritage place for a community or group for which it is significant?	
Substantially alter the setting of a heritage place in a manner which is inconsistent with the heritage values of the place?	
Substantially restrict or inhibit the existing use of a heritage place as a cultural or ceremonial site?	

5.2.10 Site Contamination

Table 5-2 summarises the environmental site setting identified from a desktop review of publicly available information, a review of available historic aerial photographs and nearby historic investigations.

Table 5-2: Environmental Settings

Item	Relevant Site Information
Topography, Drainage and runoff	The site is relatively level and is located on the catchment divide of Arundel Creek and Steele Creek catchments. Surface water from a rain event is likely to infiltrate to ground or sheet flow west towards Arundel Creek and east, south-east to Steele Creek. As part of development all runoff from developed areas will be diverted towards Steele Creek.
Nearest Surface Water Body	The nearest surface water bodies are a tributary of Arundel Creek, located approximately 800 m west of the site and Steele Creek which is located along the eastern boundary of the site. Melbourne Airport has constructed an end of line sediment retention and biofiltration surface water treatment facility. Runoff from this site will discharge into this treatment facility prior to leaving the Melbourne Airport Estate.
Regional and Site Geology	Based on geological information presented in the 1:63,360 Geological Survey of Victoria, Sunbury Sheet Part 7822 Zone 55 (GSV 1973), the site is underlain by Newer Volcanic Group quaternary olivine basalt. The Newer Volcanic Group soil comprises of high plasticity silty clay. Soils are considered to have an extremely low (1-5 %) probability of occurrence of acid sulphate soils.
Regional Hydrogeology	Based on review on Visualising Victoria's Groundwater (VVG) the upper most aquifer in the region is within fractured Newer Volcanics basalt with the depth to groundwater expected to be 5 to 50 m below ground level (bgl) but can occur in deeper geologic units across the Melbourne Airport Estate (M3R MDP 2024, Chapter B3-p75) Groundwater well GW012 is located 140m south of the eastern extent of the site and forms part of the Melbourne Airport Estate groundwater monitoring network (M3R MDP Chapter B3, 2024). It has a reported depth to groundwater of ~22m bgl and reports a salinity of 736 mg/L (Cardno 2018). Groundwater flow direction is inferred to flow in a south westerly direction towards the Maribyrnong River (>1km southwest of the site) (M3R MDP 2024, Chapter B3-p74). Given the reported depth to groundwater, groundwater is not expected to be impacted as part of this site development.
Historic Site Use	The site is currently vacant and understood to have been historically used for agricultural grazing. No significant developments were observed within the area of interest on historic aerial photographs dating back to 1951.
Broader Melbourne Airport Estate	Prior to the 1960s, the Melbourne Airport Estate was predominantly used for grazing and crops. Airport development commenced in the 1960s. A number of potential contaminating activities have occurred since, in particular the use of PFAS. Since airport development in the late 1960s, the Melbourne Airport Estate has been subject to extensive ground disturbance associated with runway construction and maintenance, fire training, filling, waste management, fuel storage, construction compounds, material stockpiling and recycling activities, as well as historical agricultural, landfill and incineration land uses. Further information on broader Melbourne Airport Estate is reported in M3R MDP 2024, Chapter B3-p75-81.

Based on the historic use of the site, diffuse PFAS contamination, consistent with the wider airport estate is considered to be the primary contaminant of potential concern (CoPC). As part of its ongoing environmental management in accordance with its Environment Strategy and the Airports Act and regulations, Melbourne Airport is assessing and monitoring PFAS contamination on airport property and is working closely with stakeholders including the airport's major tenants and DITRDCSA on management options.

At the time of writing, PFAS NEMP 3.1 (HEPA 2025) is the most current version of the guidance documentation and has been considered for the purposes of undertaking this assessment.

The Melbourne Airport PFAS Management Framework Revision 3 (APAM 2025) provides guidance on reuse of PFAS-impacted soil and water across the Melbourne Airport estate and acceptance of material at a temporary PFAS Storage Facility or other temporary stockpile locations. The framework identifies 5 management levels for soil re-use and/or management. This framework has been reviewed by the AEO and is being applied to current construction and maintenance projects across the Melbourne Airport Estate.

APAM has undertaken several soil investigations in and adjacent to the project area. The site was included as part of Melbourne Airport estate-wide investigations (Cardno 2018) (**Appendix H**). These investigations were primarily to confirm PFAS impacts across the estate but also included a broad range of other potential contaminants of concern. Only 7 sample locations were included within the site boundary as it is not identified as a potential area of concern (as reported in M3R MDP 2024, Chapter B3-p75). PFAS concentrations were reported to be 'Management Level 1' in accordance with the Melbourne Airport PFAS Management Framework. The reported soil concentrations also reported below applicable PFAS NEMP human health and ecological soil screening criteria, including the ecological indirect exposure criterion of 0.003 mg/kg (HEPA, 2025). PFAS soil concentration heat maps are available in M3R MDP 2024, Chapter B3-p83) as well as further information on the broader understanding of PFAS impacts and non-PFAS impacts across the Melbourne Airport estate.

More contemporary investigations have included a soil investigation as part of the Sky Road Extension (Aurecon, 2022 - Appendix I) and a soil contamination assessment for the proposed warehouses at Lot 7, Sky Road (A.S.James 2023) (**Appendix J**). Both reports detail that concentrations of PFAS in soils were below thresholds for categorisation as 'Management Level 1' in accordance with the Melbourne Airport PFAS Management Framework (APAM, 2025) and therefore the material can be reused. Furthermore, no exceedances of the adopted criteria under the PFAS NEMP (HEPA, 2020) (PFAS NEMP 2.0) were reported. A review of PFAS soil concentrations against PFAS NEMP 3.1 (HEPA 2025) confirm that soil concentrations also reported below applicable PFAS NEMP human health and ecological soil screening criteria, including the ecological indirect exposure criterion of 0.003 mg/kg (HEPA 2025).

Further investigations will be carried out for each warehouse lot prior to construction once proposed warehouse requirements are better understood. This will take into consideration the following:

- The locations and depths of any earthworks.
- The expected volumes of potential contaminated materials, if any, to be produced including soil, water and hardstand material, and the fate of such material.
- The expected duration of excavations / bare earth being exposed.
- Assessment of environmental suitability of any fill material proposed to be imported onto the site.

As discussed in **Section 3.2.2**, a project-specific CEMP will be prepared for each warehouse and will detail the environmental measures to be implemented during delivery of the project. The CEMP must meet Melbourne Airport's minimum requirements including approval by the APAM Environment and Sustainability Team and review by the AEO before commencement of the projects.

Mitigation measures and management protocols will be implemented to manage any potential for mobilisation of PFAS and other contaminants in accordance with the Melbourne Airport PFAS Management Framework (APAM 2025) and PFAS NEMP 3.1 (HEPA 2025), including vehicle hygiene, risk-based management and on-site stockpiling, storage and containment and transport of PFAS contaminated materials.

5.3 Cumulative Impacts

5.3.1 Residual Impacts of the Proposed Action

The project is a part of the continued non-aviation development of the Landside Business Precinct in line with the Melbourne Airport Master Plan 2022, which is essential to support the airport's economic versatility and complement the projected growth of the airport with its non-aviation operations through continued development of its industrial, logistics, and manufacturing industries.

Currently, there is an existing approval (Part 13 Permit E2022-0207) for impacts on NTGVVP within the proposed project area to allow for the extension of Sky Road to the west to allow for road access to new warehouse locations (locations subject to this referral application).

Considering the airport's key functions, the existing aviation and non-aviation activities, the increasing demand for supporting operations and facilities within the airport and the long-term and sustainable growth of the airport, and the existing approval for the extension of the existing Sky Road to the west, it is considered that there are no viable alternatives other than the proposed action. As such, the proposed action cannot be avoided.

Residual significant impacts on MNES associated with the proposed action are discussed in **Section 7.1.** Residual impacts will be offset in accordance with the EPBC Act Environmental Offsets Policy (DSEWPaC 2012b), as per the proposed offset strategy outlined in **Section 7.2**.

5.3.2 Potential for Cumulative Impacts

While the proposed action will contribute to a reduction in the extent of NTGVVP within the airport estate, impacts are not expected to materially affect the long-term viability or extent of the remaining NTGVVP, having regard to the areas retained for conservation management and the proposed offset strategy.
It is noted that most grassland within the airport estate is highly modified and species-poor, having recolonised land that has previously been subject to earthworks as part of the original construction of the airport in the 1960s.

5.3.3 Potential for Existing Pressures and Threats to be Exacerbated

The proposed action is not likely to exacerbate existing pressures and threats to threatened species and ecological communities in the airport. Once the project is completed, the project area will be fully developed with no ongoing impacts to threatened species and ecological communities.

6.0 Avoidance, Mitigation and Management Measures

6.1 Avoidance Measures

The project has avoided the removal of vegetation as much as possible, however is constrained to the area dedicated to the expansion of the Business Park, in line with the Melbourne Airport Master Plan 2022. Through the planning process of the Melbourne Airport expansion, the project has designated the area to the west of this project as a conservation area and therefore will avoid any further impacts to native vegetation. This project will result in very minor impacts to the very eastern extent of this conservation area in relation to upgrade of existing waster infrastructure assets (**Figure 3**). Impacts to this conservation area will be avoided outside of the project footprint (**Figure 10**).

6.2 Construction Phase Management and Mitigation Measures

Melbourne Airport has a site wide Environmental Management Plan (EMP) (APAM 2021) that applies to all operations carried out by, and on behalf of APAM. This EMP includes a number of general environmental management expectations which apply to all activities undertaken across the airport

A CEMP will be developed for each warehouse project to outline the appropriate environmental goals and objectives with respect to the project. It will ensure the environmental management procedures included are consistent with the Environmental Management Plan Guidelines (DCCEEW 2024c), the Melbourne Airport EMP (APAM, 2021), the Melbourne Airport PFAS Management Framework (APAM, 2025), and PFAS NEMP 3.1 (HEPA 2025).

The project-specific CEMPs will capture all stages of each warehouse project and ensure adequate environmental controls are in place to address all potential risks and impacts that may arise during the project works.

The project-specific CEMPs will document all processes and management strategies to minimise and/or prevent impacts on ecological values. Implementation of the project-specific CEMPs will limit impacts to the proposed action area, and all downstream impacts will be considered negligible. The project-specific CEMPs will include detail on the following mitigation and management strategies:

- Protection of EPBC Act listed communities (NTGVVP) and other areas of native vegetation that are to be retained adjacent to the proposed action area (i.e. outside of the project area).Exclusion fencing will be erected to protect these areas and identified with appropriate signage such as ’Environmental Protection Area’ or ‘No-go zone’ at regular intervals along the fence line. Access to and from the project area will be restricted to the project area and traversing native and introduced grasslands outside of this project area will be strictly prohibited. Sufficient buffers will be allowed for to ensure that all construction works can be conducted within the project area, without encroaching on ‘No-go zones’. Fenced No-Go zones have been successfully implemented as a mitigation measure to protect remaining vegetation for previous projects at Melbourne Airport, including the Taxiway Zulu and Northern Compound project (EPBC 2016/7837).
- Locating all material stockpiles, vehicle parking and machinery storage within the project area, and not in areas of retained native vegetation.
- Ensuring that all employees and contractors complete environmental inductions prior to undertaking works within the project area.
- Implementation of strict hygiene protocols that reduces the risk of establishment of novel and/or high threat weeds or disease. The establishment of new high threat weeds, introduction of disease or spread of existing weeds from or around the project area will be mitigated through vehicle washdown procedures incorporated into the project-specific CEMPs.
- Measures to be implemented to prevent and manage potential mobilisation of contaminants, such appropriate sediment fencing downslope of stockpile and stabilisation of temporary stockpiles.

- Measures to be implemented in managing the offsite disposal (if unexpected contamination is unearthed) of soil excavated during project construction works, including sampling requirements, likely areas of contaminated soil and disposal requirements.
- Requirements for vehicle and onsite personal hygiene regarding minimising the potential for transportation of PFAS and other potential contaminants offsite.
- Sediment and erosion control procedures.
- Refuelling and spill response procedures.
- Requirement to comply with the conditions of CHMP 12498 in regard to heritage management.

6.3 Retained Vegetation

The project has assumed all vegetation within the project area will be removed. All vegetation outside of the project area in undeveloped areas will be retained. The surrounding area (outside of the project area) is already developed to the north, east and south. Consistent with the Melbourne Airport Master Plan 2022, the area to the west of the project area is designated in the Melbourne Airport Master Plan 2022 as a conservation, recreation and water management area. The areas for conservation, recreation and water management are shown in **Figure 10** from the Melbourne Airport Master Plan 2022. Vegetation and TECs across the airport (outside of the project area) which will be largely retained can be seen in **Figure 4**.

6.4 Summary of Avoidance, Mitigation and Management Measures

Table 6-1: Avoidance, Mitigation and Management Measures

Measure	Objectives	Responsibility	Timing	Ongoing Management and Monitoring	Framework
Development and implementation of project-specific CEMPs	Avoid and/or minimise construction-related risks to environmental values.	Contractor.	APAM Environment and Sustainability team to approve and reviewed by Airport Environment Officer prior to the commencement of the action.	As defined in the project-specific CEMPs.	Environmental Management Plan Guidelines (DCCEEW 2024c). Melbourne Airport Environmental Management Plan (APAM 2021). Melbourne Airport PFAS Management Framework (APAM 2025). PFAS NEMP 3.1 (HEPA 2025).

7.0 Offsets

7.1 Likelihood of Residual Significant Impacts on MNES

The significant impact assessments presented in **Section 5.0** detail the likelihood and extent of impacts of the proposed action on MNES and Commonwealth land.

Avoidance, mitigation and management measures have been incorporated into the design of the proposed action and are described in **Section 6.0**. These measures include refinement of the project footprint where practicable, protection of retained vegetation outside the project area, establishment of no-go zones, implementation of project-specific CEMPs, and environmental controls relating to erosion and sediment management, weed and pest management and protection of retained native vegetation.

Following application of the avoidance and mitigation measures, and with reference to the significant impact assessments, it is considered:

- likely that the proposed action will result in a significant impact on the NTGVVP, as discussed in **Section 5.1.4**;
- unlikely that the proposed action will result in significant impact to EPBC Act-listed species (GSM, SLL, GGF, and VGED, as discussed in **Sections 5.1.2**, **5.1.3**, **5.1.5** and **5.1.6**, respectively); and
- unlikely that the proposed action will result in a significant impact on Commonwealth land, as discussed in **Section 5.2**.

The residual significant impact requiring offsetting is the permanent removal of 4.09 ha of NTGVVP within the project area.

7.2 Proposed Offset Strategy

APAM is committed to securing a direct offset to compensate for the permanent removal of 4.09 ha of NTGVVP within the project area. The offset strategy has been developed in accordance with the *EPBC Act Environmental Offsets Policy* (DSEWPaC 2012), the *Offsets Assessment Guide* (DSEWPaC 2013) and the accompanying *How to Use the Offsets Assessment Guide* published by DCCEEW. The proposed offset is intended to compensate for impacts to the same MNES affected by the proposed action, being the NTGVVP ecological community. The offset strategy therefore directly addresses the residual significant impact identified in **Section 5.1.4**.

APAM has identified a proposed offset site near Weerite, VIC, which has been subject to a baseline ecological assessment (Biosis 2026b) (**Appendix K**). The proposed offset site supports NTGVVP and is considered capable of delivering long-term conservation outcomes through implementation of targeted ecological management actions. The scale of the proposed offset site provides APAM with the opportunity to implement a strategic, landscape-scale conservation program that extends beyond the requirements of the proposed action and may support future conservation and offset initiatives associated with airport development, subject to future assessment and regulatory approval.

The proposed offset site contains the same EPBC Act-listed ecological community impacted by the proposed action and occurs within the Victorian Volcanic Plain (VVP) bioregion. The proposed offset site therefore has a direct ecological relationship with the impacted matter and is considered suitable for delivery of conservation gains for NTGVVP.

The baseline assessment identified approximately 76.35 ha of NTGVVP within the proposed offset site. The proposed offset site provides flexibility to secure and manage an area of NTGVVP for offset purposes, subject to final offset calculations, landowner agreement, and determination of the area to be attributed to the proposed action.

The baseline assessment identified opportunities to improve vegetation condition and ecological function through implementation of targeted management actions, including weed control, pest animal management, ecological burning and/or grazing, biomass management, enhancement of native vegetation recruitment and ecological monitoring across the proposed offset site. These actions are expected to improve the condition, resilience and ecological function of NTGVVP at the proposed offset site over time.

Conservation gains are expected to occur in the short term through implementation of weed and pest management programs, while other gains associated with vegetation structure, recruitment and ecological function are expected to occur progressively over the medium and long term. The predicted conservation gains, management actions and monitoring requirements will be further detailed in the Offset Management Plan (OMP), as discussed in **Section 7.3**.

The proposed offset site supports an established area of NTGVVP and has been subject to a detailed baseline ecological assessment (Biosis 2026b) (**Appendix K**). The management actions proposed for the site, including weed control, pest animal management, ecological burning and/or grazing, biomass management and ecological monitoring, are established grassland management practices that have been successfully applied across native grassland ecosystems within the VVP bioregion. In addition, the proposed offset site currently supports NTGVVP in a moderate condition (weighted average VQA score of 46.93/100), providing a sound foundation for achieving measurable conservation gains. Accordingly, APAM considers there is a high level of confidence that the proposed offset site will improve and maintain the condition and ecological function of NTGVVP and compensate for the residual impact associated with the proposed action.

The proposed offset site is currently privately owned. APAM is progressing arrangements with the landholder to secure the proposed offset site using an appropriate legal mechanism to ensure the site is protected and managed for the life of the impact. The final security mechanism and associated management obligations will be documented in the OMP and associated legal agreements.

APAM proposes to secure and manage 14.26 ha of NTGVVP within the proposed offset site. Based on the completed Offsets Assessment Guide Calculator (Biosis 2026c), the proposed offset is predicted to generate 1.33 adjusted hectares of conservation gain, compared to a residual impact of 1.23 adjusted hectares associated with the proposed action. The Offsets Assessment Guide Calculator indicates that the proposed offset delivers approximately 108% of the required offset and satisfies the minimum 90% direct offset requirement under the EPBC Act Environmental Offsets. The Offsets Assessment Guide Calculator is provided in **Appendix L**.

7.2.1 Habitat Quality Scoring System for NTGVVP

Further detail regarding the identification, extent and condition of NTGVVP within the project area is provided in **Sections 4.1.1**, **5.1.4** and **5.3.1**.

For the purpose of offset calculations, NTGVVP has been assessed using the Victorian Department of Energy, Environment and Climate Action (DEECA) Vegetation Quality Assessment (VQA) methodology, underpinning the ‘habitat hectares’ concept (**Appendix C**). ‘Habitat hectares’ is Victoria’s standard metric to quantify native vegetation losses and gains for regulatory approvals and biodiversity offsets. It gives habitats a score out of 100: a site condition score out of 75 plus a landscape context score out of 25. When expressed as a decimal (i.e. divided by 100 for a score out of 1), the VQA score can then be multiplied by the area of the vegetation (in hectares) to calculate the number of habitat hectares in a patch of vegetation.

This method is a good surrogate for habitat quality because it considers important structural and functional elements. These include the density of large trees, understorey complexity, plant species richness, weediness, plant recruitment and coarse woody debris. It also considers the physical connectivity of native vegetation in the landscape (e.g. patch size, configuration and continuity). VQA scores are readily converted to habitat scores out of 10 for use in the Offsets Assessment Guide.

A baseline assessment of the proposed Weerite offset site was undertaken by Biosis in December 2025 (Biosis 2026b) (**Appendix K**). The assessment identified approximately 76.35 ha of NTGVVP and calculated a weighted average VQA of 46.93/100, equivalent to a habitat quality score of 5/10 for the purposes of the Offsets Assessment Guide.

The quality score for the proposed offset site as well as other parameters to be used in the Offsets Assessment Guide are set out in **Table 7-1**.

Following completion of negotiations to secure the proposed offset site, the baseline assessment results (Biosis 2026b) (**Appendix K**) will be used to inform the final offset calculations and development of the OMP.

Table 7-1: Impact Calculator (Biosis 2026c)

Parameter	Input	Justification for Input
Annual Probability of Extinction	6.8%	The annual probability of extinction of NTGVVP, a critically endangered ecological community, is 6.8% based on International Union for Conservation of Nature (IUCN) category definitions. This % is set by DCCEEW guidance.
Area	4.09 ha	A total of 4.09 ha NTGVVP has been mapped within the project area.
Quality	3/10	Biosis assessed the quality of the NTGVVP across the project area using the Vegetation Quality Assessment (VQA) method (Victorian Department of Sustainability and Environment 2004). The assessment, including the 2022 and 2025 field assessments reported in Biosis 2023 and 2026a (**Appendix C** and **Appendix G**, respectively) confirmed that 4.09 ha of NTGVVP will be impacted by the proposed action. The weighted average VQA score for the impacted NTGVVP within the project area is 29.73/100, which converts to a habitat quality score of 3/10 for the purposes of the Offset Assessment Guide. This score has been adopted as the current quality score for the impacted NTGVVP ecological community. The baseline assessment of the proposed offset site is addressed separately and is informed by Biosis 2026b (**Appendix K**).

7.3 Offset Management Plan

An OMP will be prepared for the proposed offset site and provided to DCCEEW as a standalone document. The OMP will be prepared by a suitably qualified ecologist and in accordance with the DCCEEW's *Environmental Management Plan Guidelines* (DCCEEW 2024) and will document:

- Baseline ecological values and condition of the proposed offset site;
- Management objectives and performance criteria;
- Management actions required to achieve predicted conservation gains;
- Ecological monitoring and reporting requirements;
- Adaptive management measures;
- Responsibilities for implementation; and
- The mechanism proposed to secure and manage the offset site for the life of the impact.

The OMP will also identify monitoring methods and performance indicators that will be used to assess whether the offset is achieving the conservation outcomes described in the offset strategy (**Section 7.2**).

8.0 Ecologically Sustainability Development (ESD)

The National Strategy for Ecologically Sustainable Development (Ecologically Sustainable Development Steering Committee 1992) defines the goal of ecologically sustainable development (ESD) as *development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends*.

Section 3(1)(b) of the EPBC Act states that an object of the Act is *to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources*. Section 3A of the EPBC Act sets out the principles of ESD.

All building works at Melbourne Airport must be consistent with the Melbourne Airport Master Plan 2022, which includes planning objectives for the airport as well as the Airport Environment Strategy.

The Airport Environment Strategy is part of APAM's Environmental Management Framework and aims to:

- Continually improve environmental management practices.
- Maintain and appropriately manage Indigenous and non-Indigenous (historical) cultural heritage values.
- Ensure strong stewardship of the physical environment.
- Meet all compliance obligations and maintain the goodwill of regulators, passengers and the community.
- Assist in delivering the APAM Environment, Social and Governance (ESG) Strategy - People, Environment and Community - priorities and targets.
- Future-proof the environmental value of the airport site.

More generally, Melbourne Airport operates within a framework of corporate governance, goals and values. These are reflected in the environmental management principles outlined in the APAM Environment and Sustainability Policy (March 2022). Being an ESG-aligned business, APAM's drivers and targets include:

- Integrating ESD principles in all new developments.
- Ensuring the conservation and stewardship of the natural and physical environment APAM operate in.
- Having a positive impact on the community and stakeholders though engagement, support and advocacy on important local issues.
- Ensuring that the people, as well as employees across the airport and precinct, work in a safe and inclusive environment.
- Driving positive organizational and societal change through responsible governance and leadership.
- Investing in and prioritizing initiatives relating to carbon emissions, water quality and PFAS management, waste management, diversity and inclusion, first nations acknowledgment and celebration and sustainable procurement practices within APAM ensuring its contribution to positive employment outcomes and sustainable supply opportunities for the local community.

By implementing these actions, Melbourne Airport will continually improve the resource efficiency of its operations and minimise its overall ecological footprint.

APAM's Environmental Management Framework enables Melbourne Airport to effectively manage and adapt to environmental risks, and continually improve environmental management practices and performance – a key part of APAM's ESG framework. Further details of APAM's Environmental Management Framework are provided in **Section 10.2**.

The project has taken into account the relevant objectives and targets as set out in the current Melbourne Airport Master Plan 2022 – including APAM's Environment Management Framework and the APAM Environment and Sustainability Policy – and in line with the ESD principles.

Table 8-1 lists the ESD principles and outlines how they have been considered and addressed in relation to the project.

Table 8-1: Principles of ESD

ESD Principle Outlined in the EPBC Act	Applicability of the Principle	Application of the Principle
(a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.	Applicable.	Considerations relating to impact on the environment are discussed in **Section 5.0**. Economic and social aspects are discussed in **Section 9.0**. Other than management of offsets for the residual significant impact to NTGVVP, it is not expected to be any long-term economic, environmental, social and equitable considerations in relation to the project.
(b) 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.	Not Applicable.	Comprehensive desktop and field studies were undertaken to assess the impacts of the proposed action. Information gathered during these studies was used to inform the project. In this regard, there are not considered to be any areas where lack of full scientific certainty has prevented the assessment of impacts and development of avoidance, mitigation and management measures for this project.
(c) 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.	Applicable.	As discussed in **Section 5.3.1**, the project is a part of the continued non-aviation development of the Landside Business Precinct in line with the Melbourne Airport Master Plan 2022, which is essential to support the airport's economic versatility and complement the projected growth of the airport with its non-aviation operations through continued development of its industrial, logistics, and manufacturing industries in line with the airport's highest standards of quality, sustainability, safety and security. Considering the airport's key functions, the existing aviation and non-aviation activities, the increasing demand for supporting operations and facilities within the airport and the long-term and sustainable growth of the airport – in line with the highest standards of quality, sustainability, safety and security - and the existing approval for the extension of the existing Sky Road to the west, it is considered that there are no viable alternatives other than the proposed action. As such, the project and impacts to 4.09 ha of NTGVVP located within the project area cannot be avoided. Residual significant impacts will be offset in accordance with the EPBC Act Environmental Offsets Policy (DSEWPac, 2012b), as per the proposed offset strategy outlined in **Section 7.2**. APAM has a broader approach to the conservation of biological diversity and ecological integrity across Melbourne Airport as a whole, as outlined in the Airport Environment Strategy. The Airport Environment Strategy is detailed in the Melbourne Airport Master Plan 2022, and implementation of the strategy is reviewed regularly by the Airport Environment Officer (AEO).
(d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.	Applicable.	

ESD Principle Outlined in the EPBC Act	Applicability of the Principle	Application of the Principle
(e) Improved valuation, pricing and incentive mechanisms should be promoted.	Applicable.	One of the most common underlying goals or concepts of sustainability is economic efficiency, including improved valuation of the environment. Consideration is given to environmental factors in the valuation of assets and services associated with Melbourne Airport projects. Sustainable initiatives such as the use of recycled material and a reduction in carbon emissions during in construction and operation are incentivised, as well as encouraging additional solutions from contractors to provide their own responses to potential environmental problems. • These principles reflect the idea that if the real value of natural resources is incorporated into the cost of using those resources during construction and development, it is more likely that resources will be used in a sustainable manner adequately managed and not wasted.

9.0 Economic and Social Matters

9.1 Economic and Social Impacts

Melbourne Airport is located approximately 22 km northwest of Melbourne's central business district. The airport site is approximately 2,741 ha in area. It is predominantly surrounded by non-urban uses to the immediate north and west, which helps protect the community and safeguards the airport from the encroachment of sensitive and incompatible uses. There is urban development to the east and south of the airport, comprising a mix of residential and industrial uses.

Melbourne Airport is a critical non-aviation commercial development hub, creating connections that matter, while continuing to develop a world-class airport that generates economic, social and employment benefits for Victorians. By acting in a responsible and sustainable manner, the airport will continue to deliver significant, long-lasting economic, employment and social benefits to Victoria and across Australia.

The project area is located within the western side of the MABP, in the Landside Business Precinct of Melbourne Airport. The precinct is zoned as an Activity Centre Zone providing for complementary industrial, commercial, retail, office, recreational, manufacturing, warehousing and associated activities on land not required for aviation uses - in accordance with the Airports Act and the Melbourne Airport Master Plan 2022.

The MABP is Australia’s largest business park comprising 430 ha, being more than 200 ha of land already developed, and providing facilities including large distribution warehouses supporting logistical operations, manufacturing and self-storage facilities, and smaller facilities supporting the businesses and employees and providing a level of amenity needed for the large estate. The road networks within the project area and broader MABP (e.g. Sky Road, Link Road and Airport Drive) concentrate the freight and logistics traffic to and from the freight terminals, and have been built to accommodate traffic of larger vehicles.

In line with the airport’s ESG Strategy (outlined in the Melbourne Airport Master Plan 2022), one of the six priority areas of highest importance to APAM, stakeholders and community is sustainable procurement.

Sustainable / responsible procurement is a process that aims to reduce the triple bottom line (i.e. environmental, social and economic) impacts of purchased products and services. The process considers these impacts across the lifecycle of a product or service, i.e. from raw materials to operation and disposal / recycling of waste. The scale of Melbourne Airport’s operations means the upstream and downstream impacts of its procurement decisions can be far reaching and long-lasting.

In recognition of this, Melbourne Airport includes responsible procurement within its procurement policy to help it better manage the sustainability risks up and down its supply chain, including through tenants and contractors. It also seeks to achieve positive social impact delivered through local employment opportunities, particularly through generational capital projects, such as the development of the Landside Business Precinct, including the project.

Further details on the project need and key social and economic benefits is provided in **Section 3.1**.

9.2 Stakeholder Consultation

9.2.1 Public Consultation

Generally, the use and development of the project area for non-aviation activities is outlined in the Melbourne Airport Master Plan 2022, which was subject to public exhibition for 70 business days. During this time, APAM engaged the community with a program including the following activities:

- An online platform enabling the community to engage with the project team, seek information and provide feedback.
- Community drop-in events, information sessions and listening posts.
- Digital engagement, media, editorial and social media.

Further details of APAM's broader community engagement process can be found in Part A3, Section 3.3, pp 51-54 of the Melbourne Airport Master Plan 2022.

9.2.2 Indigenous Consultation

The project area is subject to Cultural Heritage Management Plan (CHMP) 12498. Consultation with the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation, the Registered Aboriginal Party (RAP) for the area, has been undertaken as part of the development of this CHMP, and requirements for future consultation and engagement with the RAP are identified in this plan. The CHMP has been prepared in accordance with the Victorian *Aboriginal Heritage Act 2006* and has been approved by the RAP.

9.3 Projected Economic Costs and Benefits

As discussed in **Section 3.1**, the project is part of the continued non-aviation development required to support the airport's economic versatility and complement its key function as a transport hub. It supports the airport's growth and diversifies business risk, enhancing the contribution it makes to the broader community.

The project cost will vary depending on the type of warehousing, size, and bespoke requirements such as cold store. The total cost to develop the precinct would be approximately $80 to $100 million (assuming six warehouses, as per the Melbourne Airport Master Plan 2022). This estimate is based on current market rates ($/m^2) benchmarked against recent developments of similar nature.

9.4 Employment Opportunities

In 2022, local employment targets have been established for all major capital projects (i.e. projects over $20 million) and for all service provider contracts with 20 or more employees. The Landside Business Precinct where the project is located provides for a range of logistics, commercial, entertainment and industry developments. Employment opportunity expected to be generated within the Landside Business Precinct development is estimated to be upward of 500 people.

10.0 Environmental Record of the Person Proposing to Take the Action

10.1 History of Responsible Environmental Management

APAM has a satisfactory record of responsible environment management and operates under a certified Environmental Management System (EMS).

APAM has no history of proceedings with regard to protection of the environment or the conservation and sustainable use of natural resources.

As detailed in **Section 3.2**, APAM has previously been granted a Part 13 Permit (E2022-0207) for works relating to the development of land for warehousing and the extension of Sky Road to the west, which will open up the warehouse lots that are subject to the proposed action. Noting that the area related to Part 13 Permit (E2022-0207) is located within the current proposed project area, the proposed action is planned to occur subsequent to the action approved under the existing permit.

The project will be undertaken in accordance with APAM's Environmental Management Framework, as described in **Section 10.2**.

10.2 Environmental Management Framework

APAM has an Environmental Management Framework designed to ensure that processes for continuous improvement and ongoing monitoring of compliance are embedded in the way it works. The Airport Environment Strategy is part of the Environmental Management Framework and one of the key mechanisms for ensuring commitments made in Melbourne Airport's Environment and Sustainability Policy are met.

More generally, Melbourne Airport operates within a framework of corporate governance, goals and values. These are reflected in the environmental management principles outlined in the Environment and Sustainability Policy. The Environmental Management Framework enables Melbourne Airport to effectively manage and adapt to environmental risks, and continually improve environmental management practices and performance.

Under the framework, environmental compliance is internally monitored and reviewed on an ongoing basis. Compliance is also externally (and annually) formally reviewed by the AEO, on behalf of DITRDCA.

Central to the framework is Melbourne Airport's EMS which has been in operation since 2004 and is certified against the current EMS standard (ISO14001:2015). The EMS consists of the policies, plans, procedures and activities that together form a system to manage the environmental aspects of the airport and enable compliance with environmental legislation. Internal and external audits of the EMS are undertaken regularly to assess the compliance of operational systems.

The project will be undertaken in line with APAM's existing Environment and Sustainability Policy and Environmental Management Framework as described above.

More details on APAM's Environmental Management Framework can be found in Section 14.3, pages 228-232 of the Melbourne Airport Master Plan 2022.

11.0 Conclusion

APAM proposes to develop land within the MABP adjacent to Sky Road (i.e. the project area) to construct large manufacturing, logistics and industrial warehouse units that will provide industrial and office facilities for aviation and non-aviation uses.

The project is consistent with the Melbourne Airport Master Plan 2022, and is required in order to support Melbourne Airport to advance as one the State's key activity centres and transport gateways, provide for the long-term and sustainable growth of the airport and facilitate ground transport facilities and services for efficient access to the airport. By acting in a responsible and sustainable manner, the airport will continue to deliver significant, long-lasting economic, employment and social benefits to Victoria and across Australia. This project, as with all building works at Melbourne Airport, is consistent with the Airport Environment Strategy which aims to integrate economically sustainable development in all new projects.

The project is part of a staged development of the MABP. Works subject to a Part 13 Permit (E2022-0207) relating to the development of land for warehousing and the extension of Sky Road to the west will be completed first, which will then open up the warehouse lots that are subject to this PD. The area related to E2022-0207 is located within the proposed project area. The proposed action is planned to occur subsequent to the action approved under Part 13 Permit (E2022-0207).

The project area is located within a modified and managed environment. The surrounding areas have recently undergone disturbance during construction of numerous warehouse facilities to the north, east and south of the project area. Despite the existing level of disturbance, specialist studies and assessments were undertaken within the project area and confirmed:

- The project area supports 4.09 ha of NTGVVP, which will be directly and permanently impacted as a result of vegetation clearing. The project will likely result in residual significant impacts on the NTGVVP ecological community within the project area.
- There is limited value for native fauna and flora within the project area due to historic land clearing and current land management, which includes vegetation mowing and insecticide spraying regime, in line with airport operational and safety requirements, and grazing activities on adjacent land.
- The project will be undertaken within Commonwealth land and potential impacts include minor excavation of soils with low-level contamination, clearing and disturbance of native vegetation, and potential impacts on cultural heritage values. The project would not result in a significant impact on Commonwealth land.

APAM will manage and offset any potential impacts associated with the proposed action, including:

- A Construction Environment Management Plan (CEMP) will be developed to outline the appropriate environmental goals and objectives with respect to the project. The CEMP will document all processes and management strategies to minimise and/or prevent impacts on ecological values. Implementation of the CEMP will limit impacts to the project area, and all downstream impacts will be considered negligible.
- APAM is committed to securing a direct offset to compensate for the permanent removal of 4.09 ha of NTGVVP within the project area, in accordance with the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012). APAM has identified an offset site which will be suitable to provide the required offset, and is currently engaging with the landowner to secure the offset.

With regard to ESD, APAM has a broader approach to the conservation of biological diversity and ecological integrity across Melbourne Airport as a whole, as outlined in the Airport's Environment Strategy and discussed in **Section 8.0**. The project has been designed and assessed having regard to environmental, social and economic considerations, incorporates avoidance and mitigation measures where practicable, and provides for long-term conservation outcomes through implementation of the proposed offset strategy (**Section 7.2**). Long-term environmental, social and economic considerations associated with the proposed action include the establishment, protection and ongoing management of a proposed offset site designed to compensate for the residual impacts associated with the removal of NTGVVP. In addition, the proposed action will be undertaken in accordance with APAM's Environmental Management Framework (included in section 14.3 of the Melbourne Airport Master Plan 2022) and Airport Environment Strategy, which seeks to conserve ecological values while supporting the sustainable long-term growth of the airport. APAM will ensure the actions associated with the Sky Road Warehouse project are undertaken in accordance with the principles of ESD set out under the EPBC Act.

Based on the assessments presented in this PD, APAM considers that the proposed action is environmentally acceptable and consistent with the objectives and requirements of the EPBC Act. While the proposed action will result in a significant residual impact on 4.09 ha of NTGVVP, this impact can be appropriately managed and offset through the avoidance, mitigation, management and offset commitments described in this PD. The proposed action is not expected to result in significant impacts on EPBC Act-listed fauna species, listed migratory species or Commonwealth land.

Accordingly, APAM considers that the proposed action should be approved under the EPBC Act, subject to implementation of the commitments described in this PD, including preparation and implementation of project-specific CEMPs and an OMP.

The additional information presented in this PD fulfils DCCEEW's RFI issued via letter dated 22 January 2024 (**Appendix A**), DCCEEW's response issued via email on 27 May 2025 (**Appendix E**), and further correspondence issued via letter dated 30 October 2025 (**Appendix F**).

This PD submission demonstrates that the proposed action can be undertaken in a manner that (so far as reasonably practicable) avoids, minimises, mitigates and offsets impacts while supporting the strategic development objectives of Melbourne Airport and the long-term economic and social benefits associated with continued development of the MABP. Having regard to the assessments presented in this PD, APAM's Environmental Management Framework, commitment to implementation of the proposed avoidance, mitigation and offset measures, and the principles of ESD, APAM considers the proposed action to be environmentally acceptable and suitable for approval under the EPBC Act.

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13.0 Principles and Limitations

The following principles (summarised in **Table 13-1** below) are an integral part of drafting the application and are intended to be referred to in resolving any ambiguity or exercising such discretion.

Table 13-1: Principles and Limitations

Area	Description
Limitations of Information	This Preliminary Documentation (PD) has been prepared by Senversa Pty Ltd (Senversa) for the use of Australia Pacific Airports (Melbourne) Pty Ltd (APAM). It has been prepared in accordance with the scope of work and for the purpose outlined in the proposal dated 16 February 2024, 19 June 2025, 17 November 2025 and 23 June 2026. The sources of information used in preparing this PD are identified throughout the document and comprise information derived from APAM, Biosis, Dr Vincent Clark & Associates, A.S.James, Aurecon, Cardno, Gagin and publicly available Commonwealth and State government information sources. Information incorporated in this PD was current at the time of preparation and includes ecological assessments, targeted survey reports, environmental investigations, airport planning documentation, Commonwelath guidance documents and regulatory correspondence prepared between 2008 and 2026. In preparing this PD, Senversa has relied upon the information sources identified and has not independently verified information beyond the agreed scope of works. Senversa assumes no liability for any inaccuracies, omissions or errors in information supplied by third parties. No indications were found during preparation of this PD that information contained in this document and provided to Senversa was intentionally false.
Reliability of Information	The reliability of information used in this PD was assessed through review of available background documentation, consideration of the methodology adopted by specialist consultants, review of survey effort and assessment approaches, and in consideration of relevant Commonwealth and State guidance documents where applicable. Ecological assessments and targeted surveys relied upon in this PD were undertaken by suitably qualified specialists and, where relevant, were assessed against applicable Commonwealth survey guidelines, conservation advice, recovery planning documents and established ecological assessment methodologies. The adequacy of surveys and supporting information is discussed in **Section 4.2**.
Uncertainty	Where uncertainty existed, a precautionary approach has been adopted and assessments have drawn upon multiple lines of evidence, including habitat assessments, targeted surveys, historical records, previous investigations, land management history and published scientific information. The assumptions, limitations and uncertainties associated with specific investigations are described in the relevant source documents referenced throughout this PD.
Guidelines, Plans and Policies Considered	This PD has been prepared with consideration of relevant Commonwealth legislation, policies, guidance material and planning documents, including but not limited to: • *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); • EPBC Act Environmental Offsets Policy (DSEWPaC 2012); • Offsets Assessment Guide (DSEWPaC 2013); • EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DoE 2013); • EPBC Act Significant Impact Guidelines 1.2 – Actions on, or impacting upon, Commonwealth Land and Actions by Commonwealth Agencies (DSEWPaC 2013); • Relevant species-specific survey guidelines, conservation advice and recovery planning documents; • Environmental Management Plan Guidelines (DCCEEW 2024); • *Airports Act 1996* and associated regulations; • Melbourne Airport Master Plan 2022, including the Airport Environment Strategy; and • Other legislation, guidance documents, policies and technical references identified throughout this PD.
Level of Assessment	Senversa prepared this PD in a manner consistent with the level of care and skill ordinarily exercised by members of Senversa's profession practicing in the same locality under similar circumstances at the time the services were performed.
Nature of Advice	This PD should be read in full. No responsibility is accepted for use of any part of this PD in any other context or for any other purpose or by third parties. Senversa does not seek or purport to provide legal or business advice.

Figures

Figure 1: Proposed Warehouse Locations

Figure 2: Business Park Master Plan

Figure 3: Existing Infrastructure

Figure 4: EPBC Listed Species within Melbourne Airport

Figure 5: Previous GSM Surveys

Figure 6: Previous SLL Survey

Figure 7: Previous GGF Surveys

Figure 8: NTGVVP to be Removed

Figure 9: Heritage Places

Figure 10: Long Term Development Concept Plan

309900 310000 310100 310200 310300 310400 310500 310600 310700

5826000 5825900 5825800 5825700 5825600 5825500 5825400 5825300 5825200 5825100

JD4 JD5 JC2 JC3 JC8 JC4 JC5 JC7 JC6

MELBOURNE AIRPORT

Location of Proposed Warehouses - Sky Road (MABP)

Scale @ A3 1:3,200

0 50 100m

N

LEGEND

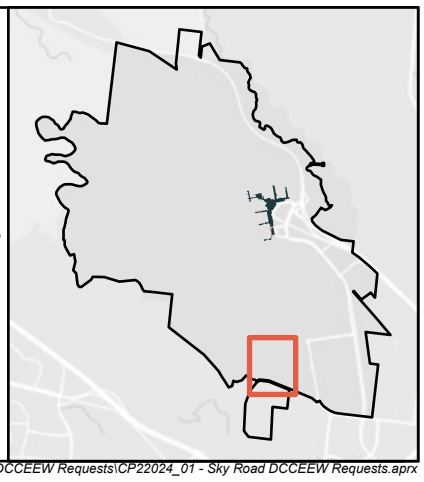
- Area subject to existing approval E2022-0207
- Proposed Warehouse Lots
- Sky Road Warehouses Project Footprint
- Airport Boundary

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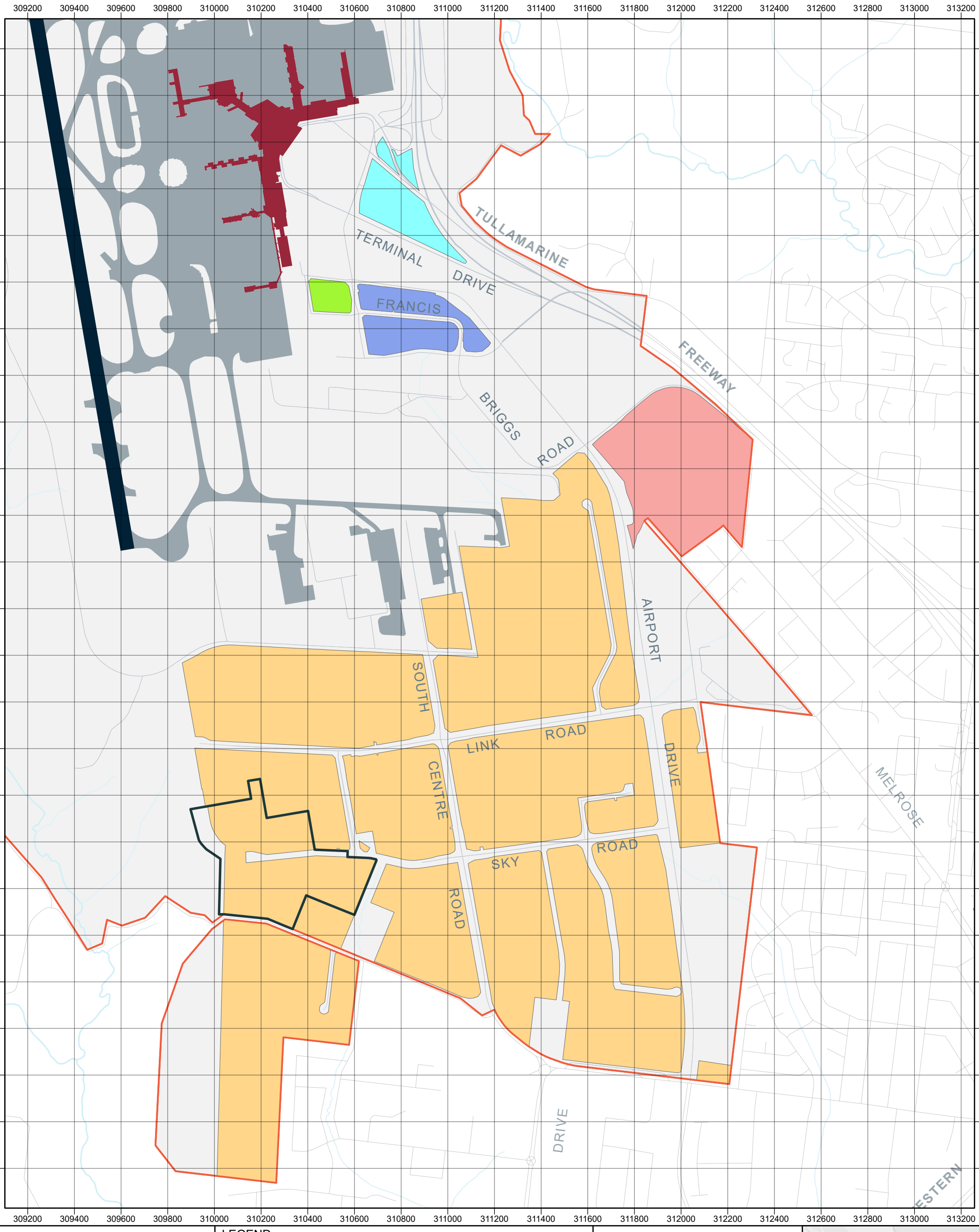
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*Co-ordinates in MGA Zone 55, GDA 94 Australian Height Datum

Map Printed: 22/08/2025 12:29 PM



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MELBOURNE AIRPORT

Business Park Master Plan

Scale @ A3 1:15,000

0 230 460m

N

LEGEND

- Sky Road Warehouses Project Footprint
- APAM Boundary
- Existing Terminal

Precincts

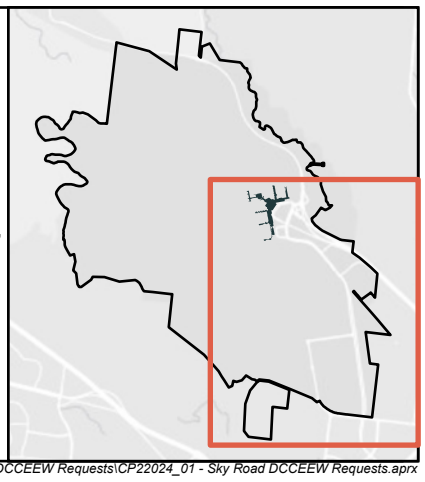
- Elite Park
- The Forefront
- Business Park
- The Hive
- Car Rental Back-up Area

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309900 310000 310100 310200 310300 310400 310500 310600 310700

5826000 5825900 5825800 5825700 5825600 5825500 5825400 5825300 5825200 5825100

MELBOURNE AIRPORT

Existing Infrastructure - Sky Road (MABP)

Scale @ A3 1:3,200

0 50 100m

N

LEGEND

- Area subject to existing approval E2022-0207
- Sky Road Warehouses Project Footprint
- Airport Boundary
- Natural Watercourse

APAM Utilities

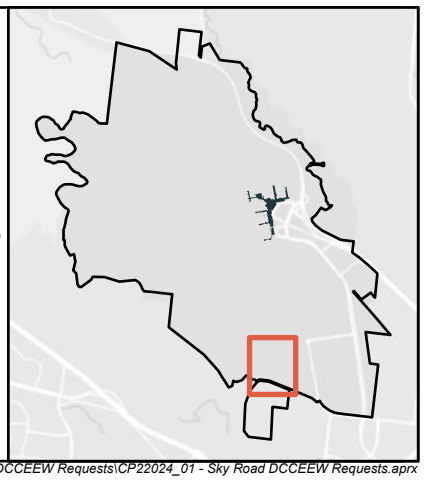
- Communications
- Drainage
- Electrical - High Voltage
- Electrical - Low Voltage
- Gas
- Sewer
- Water

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306000 307000 308000 309000 310000 311000 312000

5832000 5831000 5830000 5829000 5828000 5827000 5826000 5825000 5824000

MELBOURNE AIRPORT

EPBC listed species within Melbourne Airport

Scale @ A3 1:25,000

0 400 800m

N

LEGEND

- Sky Road Warehouses Project Footprint
- Airport Boundary

EPBC Vegetation Communities

- Grey Box Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia
- Natural Temperate Grassland of the Victorian Volcanic Plain
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

Fauna Habitats

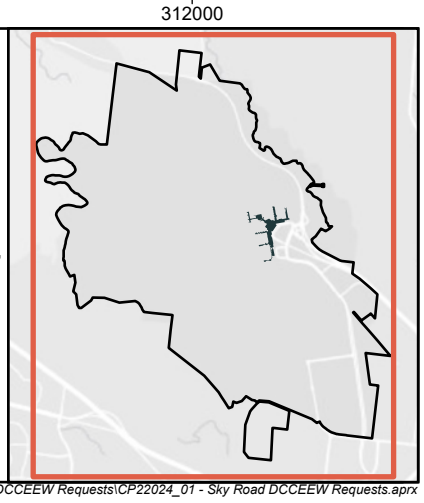
- Golden Sun Moth
- Growling Grass Frog
- Swift Parrot

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2013/2014 - Biosis (2013/2014 GSM targeted survey, Site surveyed four times during GSM flight season, No GSM detected)

2018 - Biosis (2018 GSM habitat assessment, Site surveyed once during GSM flight season, GSM detected)

2013/2014 - Biosis (2013/2014 GSM targeted survey, Site surveyed four times during GSM flight season, No GSM detected)

2019 - Biosis (2019 GSM targeted survey, Site surveyed four times during GSM flight season, No GSM detected)

2013/2014 - Biosis (2013/2014 GSM targeted survey, Site surveyed four times during GSM flight season, No GSM detected)

2014 - Biosis (2014 GSM targeted survey, Site surveyed four times during GSM flight season, No GSM detected)

2013/2014 - Biosis (2013/2014 GSM targeted survey, Site surveyed four times during GSM flight season, No GSM detected)

2018 - Biosis (2018 GSM habitat assessment, Site surveyed once during GSM flight season, No GSM detected)

2018 - Biosis (2018 GSM habitat assessment, Site surveyed once during GSM flight season, No GSM detected)

2010 - GAGIN (2010 GSM habitat assessment, Each site surveyed at least once during GSM flight season, No GSM detected)

Air Traffic Control Tower

DEEP CREEK
OAKLANDS
MOONEE PONDS CREEK
SUNBURY ROAD
TULLAMARINE FREEWAY
AIRPORT DRIVE
LINK ROAD
SOUTH CENTRAL ROAD
PARK DRIVE
CALDER FREEWAY
MELTON HWY
TAYLORS LAKES
KEILOR
MARIBYRNONG

306000 307000 308000 309000 310000 311000 312000

5832000 5831000 5830000 5829000 5828000 5827000 5826000 5825000 5824000

MELBOURNE AIRPORT

Previous Golden Sun Moth (GSM) surveys

Scale @ A3 1:26,000

0 400 800m

N

LEGEND

- Sky Road Warehouses Project Footprint
- Airport Boundary
- Airside Boundary
- Existing Terminal
- Disturbance Footprint

GSM Survey Areas

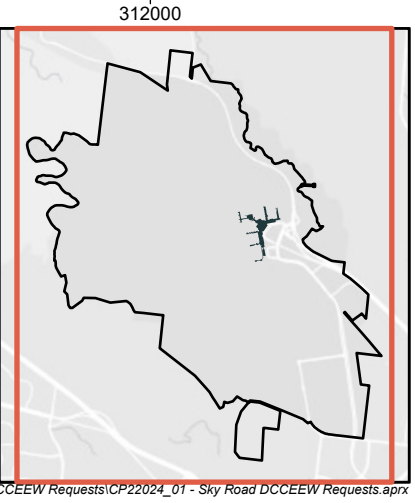
- GAGIN
- Biosis
- Biosis 2019 Survey Area

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2019 - Biosis (SLL survey grids, 20 tile grids, No SLL recorded)

2014 - Biosis (SLL survey grids, 15 tile grids, No SLL recorded)

2013 - Biosis (SLL survey grids, 5 tile grids, No SLL recorded)

2002 - Biosis (Targeted survey for SLL, 52 pitfall traps, No SLL recorded)

2013 - Biosis (Business Park SLL survey, 10 tile grids, No SLL recorded)

2009 - GAGIN Survey for the Presence of Striped Legless Lizard, 2 tile grids, No SLL recorded)

2014 - Biosis (SLL Survey grids Annandale South Grassland 2014, 10 tile grids, No SLL recorded)

Air Traffic Control Tower

DEEP CREEK
OAKLANDS R
MOONEE PONDS CREEK
SUNBURY ROAD
TULLAMARINE FREEWAY
ARUNDEL CREEK
LINK ROAD SOUTH
CENTRE ROAD
MARIBYRNONG CREEK
PARK DRIVE
CALDER MELTON HWY FREEWAY
TAYLORS LAKES
KEILOR

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5832000 5831000 5830000 5829000 5828000 5827000 5826000 5825000 5824000

MELBOURNE AIRPORT

Previous Stripped Legless Lizard (SLL) surveys

Scale @ A3 1:26,000

0 400 800m

N

LEGEND

- Sky Road Warehouses Project Footprint
- Airport Boundary
- Airside Boundary
- Existing Terminal
- Disturbance Footprint

SLL survey areas

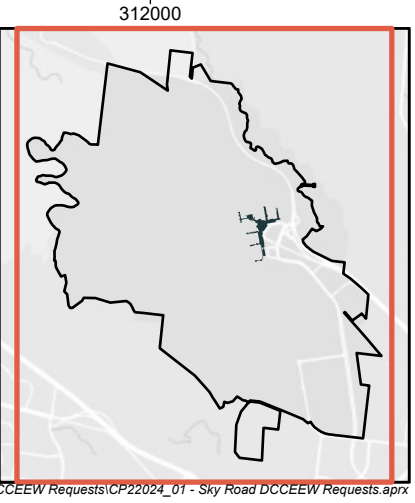
- Survey grids
- 2019 Survey grids
- Annotation areas
- Pitfall traps

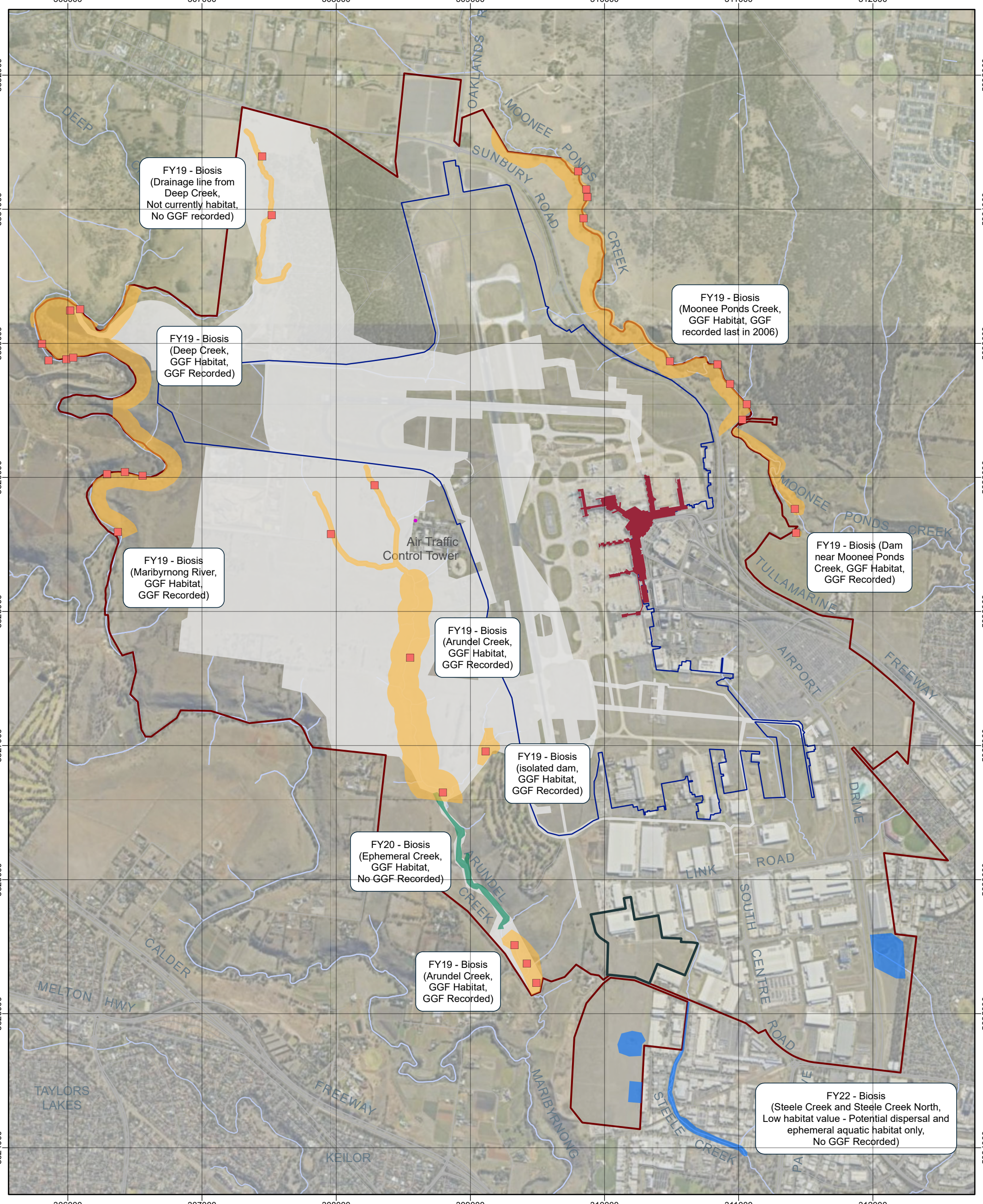
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MELBOURNE AIRPORT

Previous Growling Grass Frog (GGF) surveys

Scale @ A3 1:26,000

0 400 800m

N

LEGEND

- Sky Road Warehouses Project Footprint
- Airport Boundary
- Airside Boundary
- Existing Terminal
- Disturbance Footprint

GGF survey area

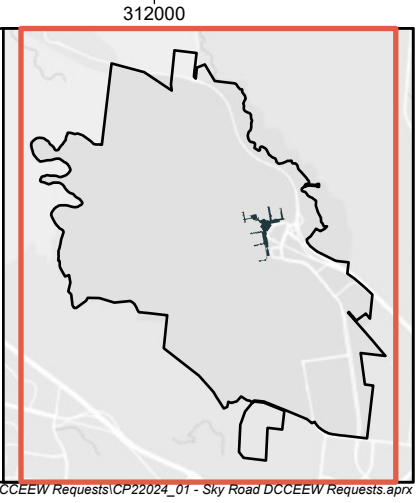
- Survey area
- Survey area 2020
- Survey area 2022
- Call play back

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5826000 5825900 5825800 5825700 5825600 5825500 5825400 5825300 5825200 5825100

EPBC to be removed (excl. area subject to existing approval)	Area (Ha)
Natural Temperate Grassland of the Victorian Volcanic Plain	4.09
EVC to be removed (excl. area subject to existing approval)	**Area (Ha)**
132 Plains Grassland	8.79

MELBOURNE AIRPORT

NTGVVP to be removed - Sky Road (MABP)

Scale @ A3 1:3,200

0 50 100m

N

LEGEND

- Area subject to existing approval E2022-0207
- Sky Road Warehouses Project Footprint
- Airport Boundary

EPBC listed ecological community

- Natural Temperate Grassland of the Victorian Volcanic Plain

Vegetation community

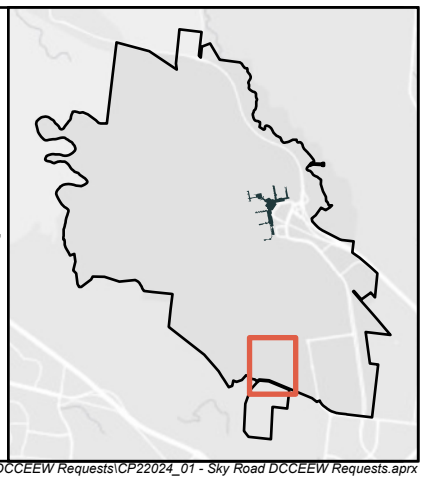
- 132 Plains Grassland

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5826000 5825900 5825800 5825700 5825600 5825500 5825400 5825300 5825200 5825100

MELBOURNE AIRPORT

Heritage places - Sky Road (MABP)

Scale @ A3 1:3,200

0 50 100m

N

LEGEND

- Area subject to existing approval E2022-0207
- Sky Road Warehouses Project Footprint
- Airport Boundary
- Registered Aboriginal Place – Not yet salvaged
- Registered Aboriginal Place Extent – Not yet salvaged

Registered Aboriginal Place – Salvaged

- Artefact Scatter
- Low Density Artefact Distribution

Cultural Heritage Management Layers

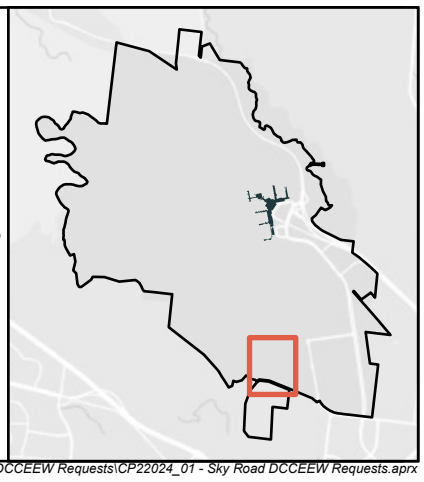
- Area subject to existing CHMP (CHMP12498)
- Known heritage values

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5832000 5831000 5830000 5829000 5828000 5827000 5826000 5825000 5824000

DEEP CREEK

OAKLANDS R

MOONEE PONDS CREEK

SUNBURY ROAD

CREEK

Western Sub-Precinct

Air Traffic Control Tower

MOONEE PONDS CREEK

TULLAMARINE FREEWAY

AIRPORT

ARUNDEL CREEK

SOUTH CENTRE ROAD

LINK ROAD

DRIVE

CALDER

MARIBYRNONG RIVER

MELTON HWY

TAYLORS LAKES

FREEWAY

KEILOR

STEELE CREEK

PARK DRIVE

MELBOURNE AIRPORT

Long Term Development Concept Plan

Scale @ A3 1:26,000

0 400 800m

N

LEGEND

- Sky Road Warehouses Project Footprint
- Airport Boundary
- Existing Terminal

CONCEPT PLAN ULTIMATE

- Runways
- Runway Starter Extension
- Taxiways
- Apron and Terminals
- Freight
- Aviation Support and Maintenance
- Future Aviation Development
- Melbourne Business Park
- Melbourne Airport City
- Recreation, Conservation and Water Management
- Non-Aviation
- Proposed Melbourne Airport Link (MAL) Road Reservation
- Sub-Precinct

ALIGNMENTS TO BE CONFIRMED

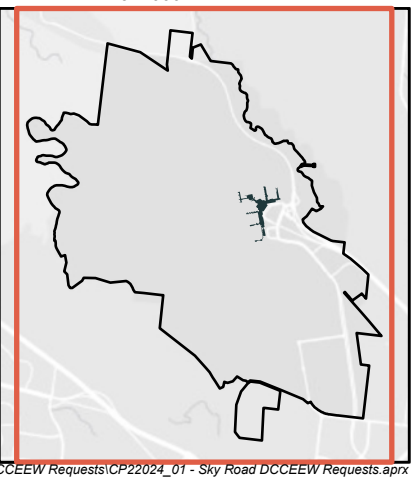
- Potential Rail
- Potential Road
- Airport Station

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Appendix A: DCCEEW Request for Further Information (Letter Reference 306 v3.2, 22 January 2024) – Submission Reference EPBC 2023/09633

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC ref: 2023/09633

[redacted]
Senior Environment & Sustainability Advisor
Australia Pacific Airports (Melbourne) Pty Limited
[redacted]

Further information required for preliminary documentation for Melbourne Airport Business Park (MABP) – Sky Road West Warehouse Developments, 66 Sky Road, Melbourne Airport, VIC

Dear [redacted]

I am writing to you about your proposal to clear and develop approximately 24 ha of land including earthworks, pavement works, the construction of industrial warehouse units, an internal road network, connections to existing road networks and the installation of utility services at 66 Sky Road, Melbourne Airport VIC 3045.

On 14 November 2023, a delegate of the Minister for the Environment and Water decided that the the proposed action is a controlled action and that it will be assessed by preliminary documentation. Further information was required to assess the relevant impacts of the proposed action.

I now request, under s95A(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), further information as outlined in the attached.

Details on the assessment process for the project and the responsibilities of the proponent are set out in the EPBC Act — Environment Assessment process fact sheet. Further information on the referral and assessment process can be found on the department's website.

If you have any questions about the assessment process or the further information required, please contact the project manager Alistair Gray, by email to epbc.victas@dcceew.gov.au and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

[redacted]

[redacted]
Director
Victoria Assessments
Environment Assessments (Vic and Tas) and Post Approvals
22 January 2024

Appendix B : EPBC Protected Matters Search Tool

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 14-Mar-2024

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	44
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	5
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	14
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community may occur within area	In feature area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Callocephalon fimbriatum](#) Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
[Climacteris picumnus victoriae](#) Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Grantiella picta](#) Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Melanodryas cucullata cucullata](#) South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pedionomus torquatus](#) Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
[Nannoperca obscura](#) Yarra Pygmy Perch [26177]	Endangered	Species or species habitat may occur within area	In feature area
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
[Litoria raniformis](#) Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area	In feature area
INSECT			
[Synemon plana](#) Golden Sun Moth [25234]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area	In feature area
Diuris fragrantissima Sunshine Diuris, Fragrant Doubletail, White Diuris [21243]	Endangered	Species or species habitat may occur within area	In feature area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area	In feature area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area	In feature area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat may occur within area	In feature area
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat likely to occur within area	In feature area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat may occur within area	In feature area
Tympanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat may occur within area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [21545]	VIC	In buffer area only
Commonwealth Land - [21500]	VIC	In buffer area only
Commonwealth Land - [22574]	VIC	In feature area
Commonwealth Land - [21593]	VIC	In feature area
Commonwealth Land - [21540]	VIC	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Melbourne Airport Business Park (MABP) ? Sky Road West Warehouse Developments	2023/09633		Referral Decision	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Melbourne Airport Rail Project Corridor Section	2021/9081		Post-Approval	In feature area
Controlled action				
Industrial Estate Cooper Road	2005/2178	Controlled Action	Post-Approval	In buffer area only
Melbourne Airport Rail Link - Albion East and West Routes	2001/197	Controlled Action	Post-Approval	In feature area
Not controlled action				
Craigieburn Rail Project	2004/1508	Not Controlled Action	Completed	In buffer area only
Development of Watervale Primary School	2005/2023	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
M80 Ring Road Upgrade	2009/5085	Not Controlled Action	Completed	In buffer area only
M80 Ring Road Upgrade, Part 2	2010/5509	Not Controlled Action	Completed	In buffer area only
Warehouse construction	2001/394	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
drainage, trenching and cable laying works	2003/1132	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Upgrade of Cooper Street, Epping	2001/292	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix C: Grassland Mapping at Sky Road West, Melbourne Airport (Biosis 2023)

1 February 2023

[redacted]
Program Manager
Infrastructure
Melbourne Airport
Locked Bag 16
Tullamarine VIC 3043

Dear [redacted]

Grassland mapping at Sky Road West, Melbourne Airport

Our ref: Matter 37335

Australia Pacific Airports Melbourne (APAM) commissioned Biosis to undertake a native grassland assessment of a parcel of Commonwealth land between Sky Rd West and Annandale Road. The vegetation and habitat of the broader area was surveyed in 2017 during the Gap Study, at which time native grassland was not identified. In 2021, however, the study area was mapped for the Melbourne Airport Rail Link (MARL) project and identified as potentially meeting the key diagnostic criteria for classification as Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) as outlined in Threatened Species Scientific Committee (2008) listing advice. In 2022, Biosis investigated the inconsistency between the 2017 and 2021 grassland mapping. Review of aerial imagery suggested that the grassland had been heavily slashed prior to the 2017 survey, resulting in the grassland not meeting the criteria to be classified as NTGVVP. Consequently, APAM requested that the project area be mapped at an optimal time to understand the extent of the native grassland within the study area.

The objective of this assessment was to:

1. Establish the presence and extent of the NTGVVP community, listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
2. Assess the mapped native grassland against the NTGVVP size and condition thresholds as defined in TSSC (2008) to determine whether it qualifies as the EPBC Act listed threatened ecological community.
3. Undertake a Vegetation Quality Assessment (VQA) of any NTGVVP grassland identified.

Site Investigation

A site investigation was undertaken on the 16 December 2022 to establish the presence and extent of the NTGVVP ecological community within the project area (Figure 1). Vegetation within the study area was assessed and recorded by two experienced botanists using hand-held GPS-enabled tablets. Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01). Patches of native vegetation, classified under the Guidelines as an area of native vegetation, with or without trees, where at least 25% of the total perennial

understorey cover is native plants. An Ecological Vegetation Class (EVC) was then assigned to each patch of native vegetation.

Assessment against NTGVVP thresholds

Patches of Plains Grassland (EVC 132) were assessed against the size and condition thresholds as defined in the NTGVVP listing advice (TSSC 2008). The *Description* and *Condition Thresholds* of an ecological community in the EPBC Act listing advice provide the definitive source of information for identifying nationally threatened ecological communities (TSSC 2008). The results of the size and condition threshold analysis are presented below.

Results

The vegetation within the study area is highly modified due to previous land clearing and current land management including cattle grazing and intensive mowing/slashing. Despite the level of disturbance, large patches of native vegetation persist within the study area. Areas where at least 25 percent of the total perennial understorey cover consists of native plants were mapped as patches of Plains Grassland, in accordance with Victoria's Biodiversity Assessment Guidelines (DELWP 2017). The patches of Plains Grassland identified during this assessment are all dominated by native grasses of the genera *Austrostipa* and *Rytidosperma* (previously *Austrodanthonia*).

The study areas contains approximately 8.23 hectares of Plains Grassland. Within this area, seven patches of NTGVVP were recorded that meet the size and condition thresholds outlined in TSSC (2008), totalling 3.068 hectares (Figure 2).

A summary of the ecological features within the study area is provided below (Table 1).

Table 1 Summary of the ecological values in the study area.

Vegetation	Description	Location	Significant values
Predominantly introduced vegetation (Photo 1)	Consisting of introduced grasses and forbs, including large areas of high threat weed species such as Chilean Needle-grass *Nassella neesiana*, Cane Needle-grass *Nassella hyalina*. Otherwise dominated by Toowoomba Canary-grass *Phalaris aquatica*, Buck's-horn Plantain *Plantago coronopus*. Native flora are scattered throughout, particularly Wallaby-grass *Rytidosperma* spp. and Spear Grass *Austrostipa* spp, but are below the cover thresholds to be considered a patch.	Distributed throughout project area, surrounding patches of native vegetation.	These areas do not support NTGVVP or other native patch vegetation.

Vegetation	Description	Location	Significant values
Plains Grassland (subset not classified as NTGVVP) EVC 132	Characterised by low quality native grassland, including species such as Kneed Wallaby-grass *Rytidosperma geniculatum,* Slender Wallaby-grass *Rytidosperma racemosum* var. *racemosum*, Windmill Grass *Chloris truncata* and Rigid Panic *Walwhalleya proluta.* Occasional herb and sub shrub interspersed including Slender Bindweed, *Convolvulus angustissimus* subsp. *omnigracilis* and Buck's-horn Plantain Berry Saltbush *Atriplex semibaccata.* Represented in habitat zones 4, 6, 42 and 43.	Distributed in various locations across project area.	These areas do not support any NTGVVP.
Natural Temperate Grassland of the Victorian Volcanic Plain (Photo 2 and Photo 3)	Higher quality patches of Plains Grassland dominated by Kneed Spear-grass *Austrostipa bigeniculata,* Spurred Spear-grass *Austrostipa gibbosa* and native wallaby grasses. Scattered exotics such as Ribwort and Toowoomba Canary-grass found through-out. Represented in habitat zones 1, 2, 3, 42a, 44, 50, 51 and 52.	Distributed in various locations across project area.	Unlikely to support habitat for threatened fauna species, based on previous disturbance and the results of extensive ecological surveys undertaken elsewhere at Melbourne Airport. The assessment of these patches are provided below.

NTGVVP assessment

The NTGVVP ecological community is listed as critically endangered under the EBPC Act. NTGVVP is endemic to south-western Victoria. The vegetation is mostly limited to a ground layer of grasses and herbs. Large shrubs and trees are absent to sparse (Commonwealth of Australia, 2011). NTGVVP occurs in a number of areas at Melbourne Airport, in varying patch size and quality. The majority of NTGVVP at Melbourne Airport is substantially degraded and previously disturbed due to the development of Melbourne Airport, grazing activities on adjacent land and the introduction and spread of exotic plant species (Biosis, 2015).

Mapping during the current assessment has refined the boundaries of the Sky Road West grassland communities. Twelve patches of native vegetation were identified including seven that meet the size and condition thresholds to be listed as NTGVVP (Figure 2). The assessment against key diagnostic characteristics for NTGVVP are presented below in Table 2.

Table 2 Assessment of habitat zones 1, 2, 3, 42a, 44, 50, 51 and 52 against Key Diagnostic Characteristics from the listing advice and whether patches within the impact area qualify (TSSC 2008).

Key Diagnostic Characteristics	Meets characteristics	Notes
The grassland is mainly associated with Quaternary basalt soils within the Victorian Volcanic Plain IBRA bioregion. Pockets of similar grassland extend into the adjacent Victorian Midlands and South-east Coastal Plain bioregions. These are included in the listed ecological community if they meet the other key diagnostic characteristics and condition thresholds.	Yes	Study area is on the Victorian Volcanic Plains and soil description matches study area.
At least one of the following grass genera is the dominant native species in the ground layer: Themeda (Kangaroo-grass), Austrodanthonia (Wallaby-grass), Austrostipa (Spear-grass) and/or Poa (Tussock-grass).	Yes	*Austrostipa* spp and *Rytidosperma* spp (previously *Austrodanthonia*) are the dominant native species.
Area extents: • **For a native vegetation remnant ≤1 hectare in size, the minimum contiguous size of the grassland patch is 0.05 hectare and the crown cover of shrubs and trees over one metre tall within the grassland patch should not exceed 5%;**	Yes	HZ 3 and 51 comprising NTGVVP within the project area are each greater than 0.05 hectares in size.
• **For a native vegetation remnant >1 hectare in size, the minimum contiguous size of a grassland patch is 0.5 hectare and the density of mature trees within the grassland patch should not exceed 2 trees per hectare**	Yes No	• Native vegetation remnant in the form of Plains Grassland EVC and NTGVVP forms patch size of 7.828 hectares. • HZ 1, 2, 42a, 44, 50 and 52 comprising NTGVVP within the project area are **greater than** 0.5 hectares in size. • HZ 42a comprising NTGVVP within the project area is **less than** 0.5 hectares in size. Trees are naturally absent from all patches.

Habitat zones 1, 2, 3, 44, 50, 51 and 52 which met the key diagnostic characteristics of NTGVVP were also assessed against the condition thresholds outlined in the conservation listing advice. A summary of these assessment results is provided below in Table 3.

Table 3 Summary of habitat zones recorded at Annandale Grassland and assessment against the key diagnostic characteristics and condition thresholds stated in the conservation listing advice

Habitat Zone	Size	EVC	Meets NTGVVP key diagnostic characteristics	Meets NTGVVP condition thresholds	NTGVVP (yes or no)
1	0.245	Plains Grassland (EVC 132)	✔	✔	Yes
2	0.222	Plains Grassland (EVC 132)	✔	✔	Yes
3	0.065	Plains Grassland (EVC 132)	✔	✔	Yes
4	0.038	Plains Grassland (EVC 132)	x	x	No
6	0.030	Plains Grassland (EVC 132)	x	x	No
42	4.874	Plains Grassland (EVC 132)	x	x	No
42a	0.027	Plains Grassland (EVC 132)	x	✔	No
43	0.193	Plains Grassland (EVC 132)	x	x	No
44	0.355	Plains Grassland (EVC 132)	✔	✔	Yes
50	1.452	Plains Grassland (EVC 132)	✔	✔	Yes
51	0.076	Plains Grassland (EVC 132)	✔	✔	Yes
52	0.653	Plains Grassland (EVC 132)	✔	✔	Yes

Vegetation quality assessment

The patches of NTGVVP were scored using the vegetation quality assessment to determine the current condition of the native vegetation. Table 4 below provides the results of this assessment.

Table 4 Vegetation quality assessment of NTGVVP recorded in the study area

Site ID			Sky Road Grassland
Habitat Zone ID			HZ 1, 2, 3, 44, 50, 51 and 52
EVC #: Name			132 Plains Grassland
		Max Score	**Score**
Site Condition	Large Trees	10	NA
	Tree Canopy Cover	5	NA
	Lack of Weeds	15	4
	Understorey	25	5
	Recruitment	10	0
	Organic Matter	5	4
	Logs	5	NA
	Total Site Score		13
	EVC standardiser		1.36
	Adjusted Site Score		17.68
Landscape Value	Patch Size	10	4
	Neighbourhood	10	2
	Distance to Core Area	5	1
	Total Landscape Score		7
Habitat points = #/100		100	24.68
CONDITION SCORE		1	0.25

Summary and recommendations

Seven patches of NTGVVP listed as critically endangered under the EPBC Act were recorded in the study area: Habitat Zones 1, 2, 3, 44, 50, 51 and 52 (amounting to 3.068 hectares). These have been assessed against the *key diagnostic characteristics* and *condition thresholds* outlined in the conservation listing advice for Natural Temperate Grassland of the Victorian Volcanic Plain. As such, each of those habitat zones is considered a Matter of National Environmental Significance and protected under the EPBC Act.

Any action that would result in an impact to the NTGVVP ecological community would need to be assessed to determine the significance of the impact. The impact area, construction methods and mitigation measures should be assessed against the Significant Impact Guidelines 1.1 and 1.2 to determine whether the proposed action is likely to have a significant impact on MNES and/or the environment on Commonwealth land.

The significance of these impacts (in the context of the EBPC Act and its associated guidelines) will guide the approvals required for the project. If the impacts are likely to be considered significant, the project will need to be referred to the Australian Government Minister for the Environment for formal assessment and approval (referral may take place by way of a Major Development Plan under the Commonwealth *Airports Act 1996*). If the impacts are unlikely to be significant, referral of the project is unlikely to be required but an EPBC Act Part 13 permit will need to be applied for.

Please contact me if you have any enquiries.

Yours sincerely

[redacted]

[redacted]
Senior Botanist

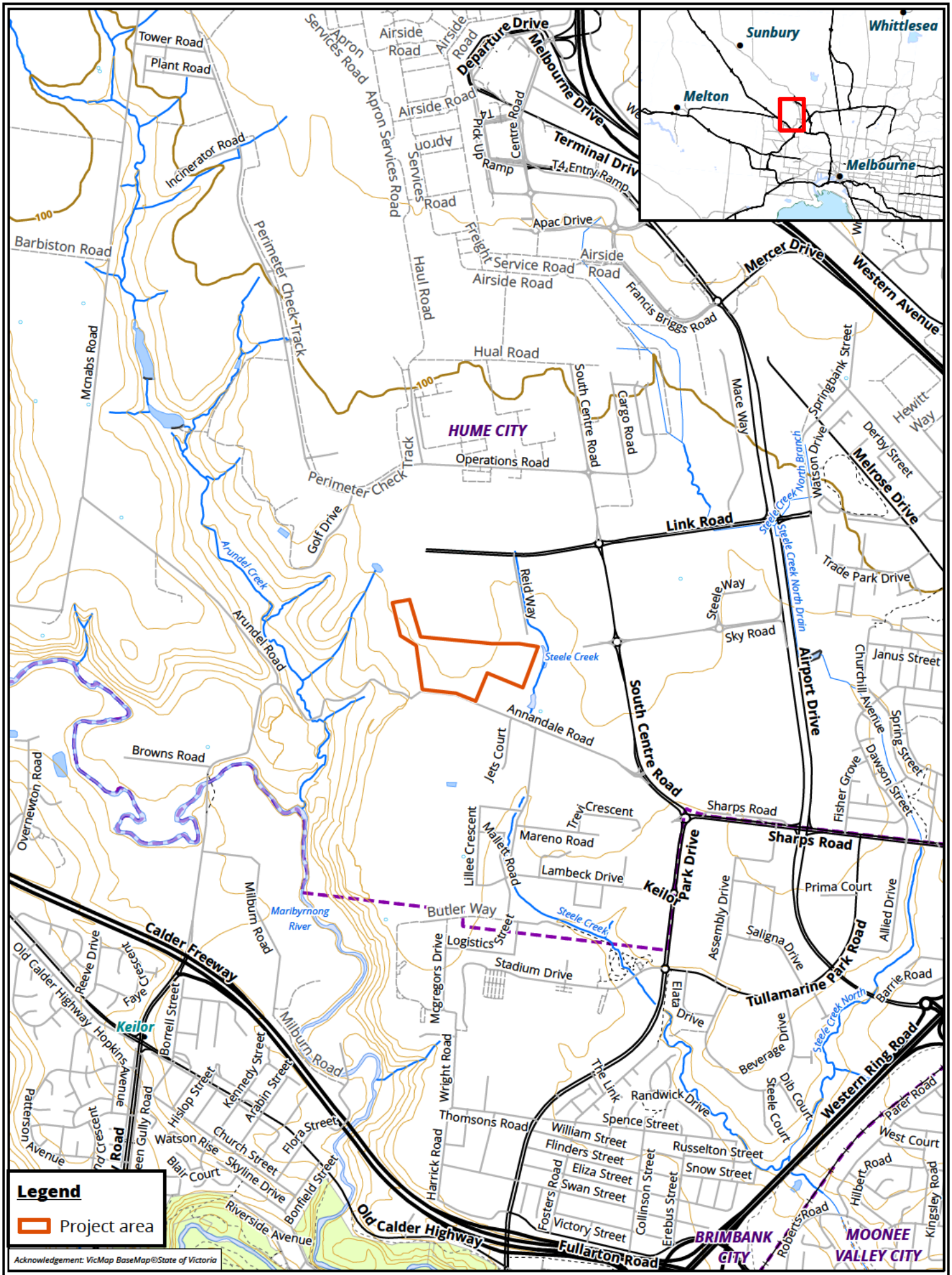
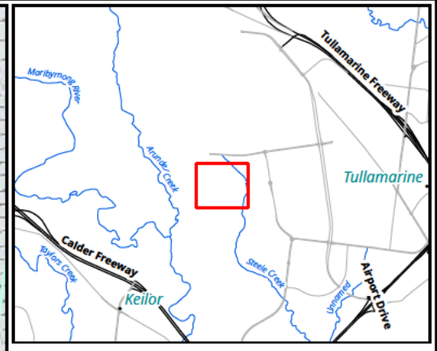


Figure 1 Location of the study area

biosis

[redacted]





Legend

Project area

EPBC listed ecological community

Natural Temperate Grassland of the Victorian Volcanic Plain

Ecological Vegetation Class

132 Plains Grassland

Figure 2 Ecological features of the study area

0 20 40 60 80 100

Metres

Scale: 1:2,500 @ A3

Coordinate System: GDA 1994 MGA Zone 55

biosis

N

References

Biosis (2015). *Flora Fauna Assessment of the Runway Development Program, Melbourne Airport: Existing Conditions and Impact Assessment Report*. [redacted] Melbourne.

Commonwealth of Australia (2011). *Nationally Threatened Ecological Communities for the Victorian Volcanic Plains: Natural Temperate Grassland & Grassy Eucalypt Woodland A guide to the identification, assessment and management of nationally threatened ecological communities*. Australian Government Department of Sustainability, Environment, Water, Population & Communities, Canberra.

DELWP 2017. *Guidelines for the removal, destruction or lopping of native vegetation.* Victorian Government Department of Land, Water and Planning, Melbourne (December 2017).

TSSC 2008. Commonwealth Listing Advice on Natural Temperate Grassland of the Victorian Volcanic Plain. Department of the Environment, Water, Heritage and the Arts. Canberra.

Appendices

Photos



Photo 1 **Predominantly Introduced Vegetation, dominated by high threat weeds including Chilean Needle-grass (photo taken 16 December 2022).**



Photo 2 **NTGVVP (HZ 50) dominated by *Rytidosperma* spp, facing north-east (photo taken 16 December 2022).**



Photo 3 **Close up of ground cover that typically dominates NTGVVP within the study area (photo taken 16 December 2022).**

Appendix D: Victorian Grassland Earless Dragon Survey (Biosis 2024)

16 August 2024

[redacted]
Senior Environment & Sustainability Advisor
Australia Pacific Airports (Melbourne) Pty Ltd
Locked Bag 16, Tullamarine, VIC 3043

Dear [redacted]

Sky Road Business Park - Victorian Grassland Earless Dragon *Tympanocryptis pinguicolla* habitat assessment

Project number: 40459

We are writing to provide you with further information following the recent habitat assessment that was undertaken to determine the potential presence of the Critically Endangered Victorian Grassland Earless Dragon *Tympanocryptis pinguicolla* (VGED) within the area proposed to be impacted by the Sky Road Business Park Project (the project) at Melbourne Airport. The project is also known as the Melbourne Airport Business Park – Sky Road West Warehouse Developments and would involve construction of warehouses and ancillary infrastructure across a footprint of approximately 24 hectares near the southern end of the Melbourne Airport estate. The 24-hectare study area excludes an existing EPBC Act approval area for Sky Road West.

The project would involve construction of carparks, warehouses, commercial buildings and ancillary infrastructure over an area of approximately 19.4 hectares (the study area) located between Mercer Drive, Airport Drive and Springbank Street, near the eastern boundary of the Melbourne Airport estate (Figure 1). We understand that APAM has submitted a referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for this project.

Project background

Australian Pacific Airports (Melbourne) Pty Ltd (APAM) referred the Sky Road Business Park project to the Australian Government Minister for the Environment on 16 October 2023 (EPBC Act Referral 2023/09633). On 14 November 2023, the delegate of the Minister for the Environment determined the project was a controlled action because it would likely have a significant impact on listed threatened species, listed threatened communities and/or Commonwealth land, all of which are matters protected under Part 3 of the EPBC Act. It was determined that the project would be assessed by way of preliminary documentation.

The scope for the preliminary documentation is outlined in a letter from the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW), dated 22 January 2024. It includes a request for further information relating to the VGED as detailed in Paragraphs 3.1.17 to 3.1.19 of DCCEEW's letter. These request an assessment of the habitat present within the study area in relation to the Approved Conservation Advice for *Tympanocryptis pinguicolla* (Victorian Grassland Earless Dragon) and Draft

Biosis Pty Ltd
Melbourne
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Port Melbourne VIC 3207
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biosis.com.au

Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.
We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.

National Recovery Plan for Four Grassland Earless Dragons (*Tympanocryptis* spp.) of Southeast Australia (DCCEEW 2023a; DCCEEW 2023b), associated scientific reasoning and an assessment of likely impacts to VGED.

Species background

The VGED had been presumed extinct in Victoria, with the last confirmed sighting in 1969, prior to the species being rediscovered west of Melbourne in early 2023. Since the rediscovery of the species, it has been listed as Critically Endangered under the EPBC Act and the Commonwealth and Victorian Governments have been working with species experts to confirm the best approach to the ongoing conservation of the species. At this stage any guidance regarding the assessment requirements for potential habitat and significant impacts are still in their infancy.

The Approved Conservation Advice for the VGED (DCCEEW 2023a) confirms that prior to the development of greater Melbourne that heavily impacted the species, the VGED was common on the plains near Sunbury and around the Melbourne CBD, with additional validated records from Sunbury, Maribyrnong River, the mouth of the Yarra River and Coode Island, Essendon and Moonee Ponds.

Review of the DEECA NatureKit tool (DEECA 2024) confirms that only one record has been documented within the vicinity of Melbourne Airport, which occurs approximately 13 kilometres north-west of the study area within the Holden Flora Reserve, south of Sunbury. While this sighting from 1990 is documented in the Victorian Biodiversity Atlas as having an 'acceptable' reliability, the Conservation Advice for VGED states that this and four other records remain unvalidated, despite intensive survey effort immediately following the sightings and during subsequent years (DCCEEW 2023a). The Conservation Advice also states that further targeted surveys have been undertaken in the Melbourne Airport area and have not detected the species (DCCEEW 2023a). The study area overlaps with the modelled distribution for the species (DCCEEW 2024).

The Conservation Advice (DCCEEW 2023a) and Draft National Recovery Plan (DCCEEW 2023b) outline that grasslands with the greatest likelihood of containing a remnant VGED population are likely to have:

- Native tussock cover with open patches of bare earth and/or naturally short open swards due to low-level disturbance (e.g. managed fire, grazing);
- Presence of suitable refugia, particularly invertebrate burrows, surface rock cover and/or soil cracks;
- A functioning invertebrate community to provide appropriate prey, as well as invertebrates that engineer burrows for refuge, particularly araneae (spiders), coleoptera (beetles) and orthoptera (grasshoppers and crickets) order fauna;
- Minimal weed cover;
- Not been de-rocked, ploughed or fertilised to improve pasture quality.

The habitat assessment of the study area considered these documented habitat requirements.

Link Road
Reid Way
Steele Creek
Annandale Road
Jets Court
Lambeck Drive

Legend

Study area

Melbourne Airport

Commonwealth land

Acknowledgements: VicMap BaseMap©State of Victoria, Imagery NearMap 2024

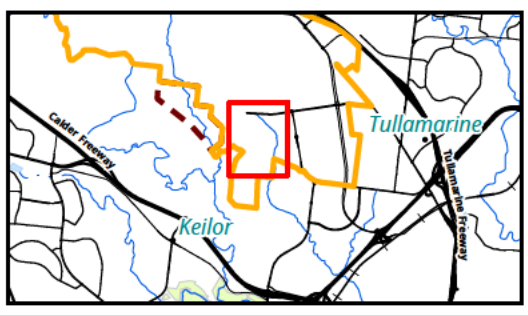


Figure 1 Victorian Grassland Earless Dragon habitat assessment study area, Sky Road Business Park, Melbourne Airport

0 50 100 150 200 250

Metres

Scale 1:4,000 @ A3

Coordinate System: GDA2020 MGA Zone 55

N

biosis

APEMGroup

[redacted]

VGED habitat assessment

Method

To assess and document potential VGED habitat values, a site-based habitat assessment was undertaken within the study area (Figure 1) on Wednesday 29 May 2024 by two experienced zoologists. The zoologists walked over the proposed study area and documented the presence/absence, extent and quality of important habitat features for VGED, in particular habitat structure, biomass levels, land management, previous evidence of disturbance, invertebrate burrows, soil cracks and broader site context. Opportunistic searching of soil cracks and invertebrate burrows was undertaken with the use of a handheld torch. Active searching beneath rocks and debris was also undertaken to locate reptiles as well as determine the invertebrate fauna present. geo-referenced note points and photographs were recorded using hand-held GPS-enabled tablets.

Subsequent to the field-based habitat assessment, historical aerial imagery featuring the study area was obtained from Australia Pacific Airports (Melbourne) and reviewed, with the assistance of Principal Heritage Consultant Gary Vines, who has significant experience interpreting historical aerial imagery to determine whether ground disturbance has occurred. Information about historical and current land management was also provided by Australia Pacific Airports (Melbourne).

Findings

The Sky Road Business Park study area supports native and introduced grassy vegetation of varying quality, which is largely influenced by weed cover, adjacent development activities and cattle grazing. Patches of Plains Grassland vegetation have been previously mapped within the study area by Biosis (2023a), including areas identified as meeting the key diagnostic criteria for classification as the EPBC Act listed Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) ecological community. Dominant native grasses in these areas include wallaby grasses *Rytidosperma* spp. and spear grasses *Austrostipa* spp. The majority of NTGVVP at Melbourne Airport is substantially degraded and previously disturbed due to the development of Melbourne Airport, grazing activities on adjacent land and the introduction and spread of exotic plant species (Biosis 2015; Biosis 2023b). The areas of NTGVVP and Plains Grassland vegetation within the study area have been previously assessed as unlikely to support threatened species, given the secondary nature of the vegetation and due to the extensive survey effort that has been previously undertaken within the broader Melbourne Airport Estate (Biosis 2023a). There is a high cover of weeds present including Toowoomba Canary-grass *Phalaris aquatica*, Chilean Needle-grass *Nassella neesiana* and Serrated Tussock *Nassella trichotoma.*

A small number of soil cracks and invertebrate burrows were recorded during the site assessment (less than five across the entire site) and these were inspected with a hand torch. No fauna were recorded utilising any of the cracks or burrows. Opportunistic active searching was undertaken to locate burrow-forming invertebrates of the Araneae, Coleoptera and Orthoptera orders. No burrowing invertebrates were recorded. No surface rock was recorded within the study area. While survey coverage, vegetation cover and season may affect the detection of these important shelter features, the results of the assessment indicate that burrows and soil cracks are unlikely to occur at sufficient densities to support a population of VGED within the study area.

Other sources of soil disturbance and compaction have been identified through the analysis of aerial imagery and from information provided from APAM. Aerial imagery from 1975 shows plough lines, which suggest that the area was ploughed. The surrounding landscape has been subjected to significant works over the past 20 years through the development of major roads and industrial development. The site has been subject to cattle grazing for over 40 years, and at times grazed intensely. Over the past 5 years, rotational cattle grazing has been employed to reduce grazing intensity. There were cattle present at the time of the habitat

assessment, and cattle yards present along the western boundary of the study area. Evidence of grazing was noted including compacted soil and pugging in lower lying areas. The evidence of previous ploughing and ongoing intensive cattle grazing indicates that significant soil disturbance has occurred across the study area, and suggests that the likelihood of VGED occurring within the study area is negligible to low.

Table 1 provides a summary of the key VGED habitat features identified within the Conservation Advice (DCCEEW 2023a) and Draft National Recovery Plan (DCCEEW 2023b), and an assessment of their occurrence within the study area.

Table 1 Summary of VGED habitat features and an assessment of presence within the study area

VGED habitat feature	Assessment of the study area
Within the modelled distribution for VGED	The study area occurs within the modelled distribution for VGED, however there are no previous confirmed records within the local area and previous targeted surveys within the broader Melbourne Airport estate have not recorded the species (DCCEEW 2023a).
Native grassland, open patches of bare earth, low biomass, low-level disturbance	Native grassland vegetation has been mapped within the study area, and scattered native tussock grasses occur more broadly across the study area. Some of the native grassland patches meet the criteria for NTGVVP. These areas support low biomass and areas of bare earth, however the site has been subjected to significant previous disturbance including ploughing, de-rocking, intensive cattle grazing and disturbance from adjacent development activities. Some patches of native grassland vegetation occur in areas that have been subject to previous soil disturbance and are dominated by colonizing species such as wallaby grasses. Consequently, these areas of native grassland have been previously assessed as secondary. They have also been assessed as unlikely to support threatened fauna species (Biosis 2023a).
Presence of suitable refugia	No surface rock is present. Burrows and soil cracks are unlikely to occur at sufficient densities to support a population of VGED within the study area.
Functioning invertebrate community	No burrowing invertebrates were recorded.
Minimal weed cover	The site supports a high cover of weeds, including Serrated Tussock, Chilean Needle-grass and Toowoomba Canary-grass.
No de-rocking, ploughing or fertilizer application	The study area has been subjected to significant soil disturbance. Historical aerial imagery demonstrates that the study area was ploughed in the 1970's. The study has also been subject to intensive cattle grazing and the absence of surface rock suggests de-rocking may have occurred. Status of fertilizer application is unknown.

Conclusion

The field-based habitat assessment and analysis of historical aerial imagery has determined that a population of VGED is unlikely to persist within the study area. This determination is largely due to the evidence of historical ploughing, ongoing disturbance (intensive cattle grazing and surrounding road and industrial development), lack of appropriate refugia and high cover of weeds. The poor habitat quality and surrounding industrial context of the study area suggest that the site has low potential for rehabilitation. The development

of the study area is therefore not likely to impact on VGED or conflict with the recovery objectives for the species.

We trust the above will assist in your understanding of the species in relation to the project. Please contact me if you have any queries.

Yours sincerely,

[redacted]
Senior Associate Zoologist

References

Biosis 2015. *Flora Fauna Assessment of the Runway Development Program, Melbourne Airport: Existing Conditions and Impact Assessment Report*. [redacted] Melbourne.

Biosis 2023a. Grassland mapping at Sky Road West, Melbourne Airport. Report to Melbourne Airport. Author: [redacted] Biosis Pty Ltd., project no. 37335.

Biosis 2023b. Melbourne Airport's Third Runway Project: Ecology Technical Report. Report for Australia Pacific Airports (Melbourne). Authors: [redacted] Biosis Pty Ltd, Melbourne. Project no. 30563, 35366 & 35215

DCCEEW 2023a. Conservation Advice for *Tympanocryptis pinguicolla* (Victorian Grassland Earless Dragon). Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra.

DCCEEW 2023b. Draft National Recovery Plan for Four Grassland Earless Dragons (*Tympanocryptis* spp.) of Southeast Australia. Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra.

DCCEEW 2024. *Species of National Environmental Significance 1km Grids February 2024*. Department of Climate Change, Energy, the Environment and Water, Canberra. Copyright: Commonwealth of Australia

DEECA 2024. *Naturekit.* Department of Energy, Environment and Climate Action. https://maps2.biodiversity.vic.gov.au/Html5viewer/index.html?viewer=NatureKit

Appendix 1

Photos of the study area



Photo 1 **Grassy vegetation dominated by Serrated Tussock in the south-eastern section of the study area, looking east towards recent construction activities.**



Photo 2 **Grassy vegetation north of the Sky Road construction area, showing the effects of shading and disturbance from adjacent development. Weed cover is greater within this zone.**



Photo 3 **Grassy vegetation dominated by dense Toowomba Canary-grass north of the Sky Road construction area, looking north.**



Photo 4 **Area of NTGVVP north of the Sky Road construction area, looking south. The small size, surrounding context, historical disturbance and lack of refugia suggest that VGED are highly unlikely to be persisting here. Cattle pugging and evidence of waterlogging present.**



Photo 5 **Aerial photography of the study area from 1975, showing evidence of plough lines.**

Appendix E: DCCEEW Response to Preliminary Documentation – Melbourne Airport Business Park (2023/09633) (27 May 2025)

[redacted]

Subject: FW: Melbourne Airport Business Park (2023/09633) - DCCEEW response to Preliminary Documentation [SEC=OFFICIAL]

From: [redacted]
Sent: Tuesday, 27 May 2025 4:10 PM
To: [redacted]
Subject: Melbourne Airport Business Park (2023/09633) - DCCEEW response to Preliminary Documentation [SEC=OFFICIAL]

EXTERNAL EMAIL: Do not click any links or open any attachments unless you trust the sender and know the content is safe.

OFFICIAL

Hi all,

I have to sincerely apologise, I thought I had sent this through already.

The department has determined that the PD for Melbourne Airport Business Park (2023/09633) does not meet the request for further information.

The key issues are summarised below.

1. Conclusions regarding habitat unsuitability are based on outdated surveys or surveys that do not cover the project area.

   According to guidance on our website (On-ground surveys and data for referred actions under the EPBC Act - DCCEEW):

   'We generally can't accept survey data that's more than 5 years old because:
   - populations of species can change due to fires, drought, flooding and land management changes
   - some species' ranges can shift due to climate change.

   If your data is older than 4 years when you start planning your project, you might need to do another survey.'

   Outdated surveys provide limited support to conclude a species is not present.

   The PD requires a more thorough demonstration that it does not provide suitable habitat for relevant species, and relevant species are not present at the site. Further justification may be provided by more detailed habitat suitability assessments.

2. Figures are not captioned.

   Please caption each figure within the body text.

3. The PD incorrectly describes listing status of Victorian Grassland Earless Dragon (VGED).

VGED has been listed as Critically Endangered since 1 June 2023, following the taxonomic split. Prior to the taxonomic split, VGED was considered as part of the greater grassland earless dragon complex of four species and was listed as Endangered.

Please update to reflect VGED listing status.

4. Growling Grass Frog (GGF) habitat map has potential GGF habitat in the figure. Section 4.2.3 states: There is no GGF habitat mapped within the project area.

   Please review and clarify.

5. Retention of vegetation refers to vegetation within the project boundary. The PD assumes all vegetation in the project area will be cleared, meaning there is no retained vegetation with respect to this project.

   Please review and clarify.

6. Table 1.1 references some sections incorrectly.

   Please review referenced sections for relevance to the associated RFI item. References may include multiple sections if relevant information is included in multiple sections.

If you would like to discuss the outcome of the PD adequacy review in more detail, I would be glad to arrange a meeting, or you can email me with questions.

Best regards

[redacted]
Environment Assessment Officer

Victoria Assessments Section | Environment Assessments (Vic and Tas) and Post Approvals Branch | Nature Positive Regulation Division
Department of Climate Change, Energy, the Environment and Water
Wurundjeri Woi Wurrung Country, Level 3, 500 Bourke St, Melbourne, VIC, 3000| GPO Box 3090
[redacted]

DCCEEW.gov.au | ABN 63 573 932 849

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past and present.

OFFICIAL

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Appendix F: DCCEEW Request for Further Information (Letter Reference 306 v4.6, 30 October 2025) – Submission Reference EPBC 2023/09633

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC 2023/09633

[redacted]
Head of Environment & Sustainability
Australia Pacific Airports (Melbourne) Pty Ltd
By email: [redacted]

Further information required for preliminary documentation - Melbourne Airport Business Park (MABP) – Sky Road West Warehouse Developments, 66 Sky Road, Melbourne Airport, VIC (EPBC 2023/09633)

Dear [redacted]

I am writing to you about the proposal by Australia Pacific Airports (Melbourne) (APAM) to clear vegetation and undertake construction of manufacturing, logistics and industrial warehouse units at Melbourne Airport.

On 14 November 2023, a delegate of the Minister for the Environment and Water decided that the proposed action is a controlled action and that it will be assessed by preliminary documentation. Further information was required to assess the relevant impacts of the proposed action.

On 22 January 2024, pursuant to s95A(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), a request for further information was sent to you by the department.

APAM submitted documentation on 25 November 2024 in response to the above mentioned request. In May 2025, following the receipt of this information the department advised that this information did not meet the request for further information.

The following information was provided by Melbourne Airport on 17 September 2025:

- *'Melbourne Airport Business Park (MABP) – Sky Road West Warehouses - Preliminary Documentation EPBC 2023/09633 revision 6*', prepared by Senversa and dated 17 September 2025 (Senversa report v.6, 2025)

The department is pleased to provide you the attached Preliminary Documentation Review which details the department's initial RFI and subsequent review comments. The department considers that the information currently does not meet the requirements outlined in the request for information sent by the department on 22 January 2024 and our email correspondence dated 27 May 2025. Please refer to the attached Preliminary Document Review, October 2025 prepared by the department which outlines the department comments.

If you have any questions about the assessment process or the Preliminary Documentation Review, please contact the project manager Cody Woods by email to cody.woods@dccew.gov.au, or telephone (02) 5162 3018.

Yours sincerely

[redacted]

[redacted]
Acting Director
Victoria Assessments
Environment Regulation Division

30 October 2025

Additional information required for assessment by preliminary documentation

Melbourne Airport Business Park (MABP) – Sky Road West Warehouse Developments, 66 Sky Road, Melbourne Airport, VIC (EPBC 2023/09633)

On 14 November 2023 the delegate of the Minister for the Environment determined the above project is likely to have a significant impact on the following matters protected under Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- Listed threatened species and communities (section 18 and section 18A)
- Commonwealth land (sections 26 and 27A)

It has been determined that the proposed action will be assessed by preliminary documentation. The preliminary documentation must address the matters set out below (1 to 10) and follow the content, style and formatting requirements set out in Appendix A. Noting that you have provided some of these elements of information within the original referral document, we are asking that this information be compiled with the further information into a preliminary document that informs the assessment.

Preliminary documentation for the proposal will include:

- relevant information contained in the original referral.
- relevant documents that were referenced in the referral documentation but have not yet been provided as attachments. For example, surveys results for the Golden Sun Moth and Striped Legless Lizard are mentioned in the documentation but not supplied.
- further information as requested below.
- information provided by you on the impacts of the action and the strategies you propose to avoid, mitigate and offset those impacts (as described below); and
- any other relevant information on the matters protected by the EPBC Act.

The preliminary documentation should be sufficient to allow the Minister (or delegate) to make an informed decision on whether to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

1. DESCRIPTION OF THE ACTION

Information required		Section of PD addressing item	DCCEEW response	Item met / not met
1.1	The location, boundaries and size (in hectares) of the area of the proposed action and the proposed disturbance footprint (if different to the area of the proposed action). Include mapping and coordinates as per the *Guide to providing maps and boundary data for EPBC Act Projects* (*https://www.dcceew.gov.au/sites/default/files/documents/epbca-maps-data-guidelines.pdf*). Mapping should include any adjoining areas which may be directly or indirectly impacted by the proposal, including nearby vegetation, as well as listed species habitat.	3.2 Figure 1 Figure 4 Figure 5 Figure 6 Figure 7 Figure 9	*Some information is illegible when zoomed in - Figures 1, 3, 4, 5, 6, 7, 8, 9. The department notes the image files provided separately with the PD are high resolution. Please ensure the published PD includes these high-resolution images.	Met*
1.2	A description of all components of the project and how they relate to the broader maintenance and operations at Melbourne Airport, including the anticipated timing and duration (including start and completion dates) of each component of the project including: i. The proposed construction activities associated with each stage (pre-construction, construction, and operations) ii. The excavation techniques to be used during the proposed works iii. The plans for earth works and road surfacing iv. The surface water management designs.	3.0		Met

1.3	A description of the operational requirements of the action including any anticipated ongoing maintenance works and the construction environmental management plan.	3.2.2 3.2.3		Met
1.4	An indicative layout plan for the proposed action, including the location and type of land use, key infrastructure, and stormwater management. Include mapping and coordinates for each of the above maps as per the *Guide to providing maps and boundary data for EPBC Act Projects (https://www.dcceew.gov.au/sites/default/files/documents/epbca-maps-data-guidelines.pdf)*.	3.2 Figure 1 Figure 2 Figure 3		Met

2. Habitat Assessments

Please provide a summary of the information supplied in the referral information.

Habitat assessments must be informed by desktop and field surveys (in accordance with departmental guidelines or as defined by best practice surveys), and with reference to relevant departmental documents (e.g., approved Conservation Advice, Recovery Plans, draft referral guidelines and Listing Advice, and SPRAT Database), including published research and other relevant sources.

Information required: Habitat Assessments		**Section of PD addressing item**	**DCCEEW response**	**Item met / not met**
2.1.1	Provide a recently updated summary of the habitat assessment for listed threatened species and communities in the area of the proposed action and the disturbance footprint that includes a summary of patches of **species habitat** and **buffer zones**, as described in Appendix C.	4.0		Met

2.1.2	Identify and describe records of the listed threatened species and ecological communities in the broader region. All known records must be supported by an appropriate source (i.e., Commonwealth and State databases, published research, publicly available survey reports, etc.), the year of the record and a description of the habitat in which the record was identified.	4.1 Appendix C		Met
2.1.3	Provide detailed mapping of suitable habitat within, adjacent to and downstream of the area of the proposed action for all listed threatened species and communities, which: • is specific to the habitat assessment undertaken for each listed threatened species and ecological community; • includes an overlay of the project disturbance footprint and the area of the proposed action (from 1.1); • includes known records of individuals derived from the desktop analysis (from 2.1.1 and 2.1.2) and any additional field surveys; and • is provided separately as attachments in PDF and **Shapefile(s)** (Appendix C).	4.0 Figure 4 Figure 5 Figure 6 Figure 7 Figure 9		Met
2.1.4	Results of targeted surveys to confirm the presence, status and extent of listed threatened species and communities within the area of the proposed action, undertaken in accordance with the guidance outlined in the Species Profile and Threats Database, if applicable.	4.2 Appendix C Appendix D		Met

2.1.5	An assessment of the adequacy of any surveys undertaken (including survey effort and timing). In particular, the extent to which these surveys were appropriate for the listed species or community and undertaken in accordance with relevant departmental survey guidelines.	4.3 Appendix C		Met
2.1.6	An assessment of the landscape (airport wide) context of threatened species habitat and ecological communities including connectivity between patches of habitat or ecological community, condition, sizes of patches, and approximate size of threatened species populations (if present) to inform a consideration of cumulative impacts across the airport.	4.4		Met

3. Relevant impacts

Based on the information provided in your referral, and other available information, the Department of Climate Change, Energy, Environment and Water considers that the listed species and communities identified below may be significantly impacted by the proposed action.

Listed threatened species and communities:

- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) – Critically Endangered
- Golden Sun Moth *Synemon plana* – Vulnerable
- Striped Legless Lizard *Delma impar* – Vulnerable
- Victorian Grassland Earless Dragon *Tympanocryptis pinguicolla* – Critically Endangered
- Growling Grass Frog *Litoria raniformis* – Vulnerable

It is the proponent's responsibility to be aware of any changes to the distribution of listed threatened species, and information available in the Species Profile and Threats (SPRAT) Database. The proponent must ensure that a recent Protected Matters Search Tool (PMST) report has been generated and considered before finalising the draft preliminary documentation.

The department considers the proposed action may result in, but is not limited to, the following impacts:

- Vegetation clearing and loss or fragmentation of habitat.
- Habitat degradation for remaining habitat such as contaminant mobilisation or weed, pest or pathogen invasion.

3.1 Listed threatened Species and Communities

Information required: General information on impacts		Section of PD addressing item	DCCEEW response	Item met / not met
3.1.1	Consideration of impacts must include direct, indirect and facilitated impacts occurring as a result of the action, including consideration of the nature, likelihood and severity of the impacts.	5.1.1		Met
3.1.2	A discussion of whether the impacts are likely to be repeated, for example as part of maintenance.	5.1.1		Met
3.1.3	A discussion of whether any impacts are likely to be unknown, unpredictable or irreversible.	5.1.1		Met
3.1.4	Justification, with supporting evidence, on how the proposed action will not be inconsistent with relevant conservation advice, recovery plans or threat abatement plans.	5.0		Met

Information required: Species specific information				
Golden Sun Moth *Synemon plana* - Vulnerable		**Section of PD addressing item**	**DCCEEW response**	**Item met / not met**
3.1.5	Provide mapping which includes an overlay of the project footprint and known records and habitat of Golden Sun Moth (GSM) derived from desktop analysis and field surveys.	4.2.1 Figure 5		Met

3.1.6	Results from targeted surveys to confirm the status and extent of GSM habitat within and adjacent to the area of the proposed action, undertaken in accordance with the survey guidelines outlined in the *Significant impact guidelines for the critically endangered golden sun moth* (Synemon plana). Provide the scientific reasoning for how the extent of potential habitat for the Golden Sun Moth was derived.	4.2.1 4.3.2 Figure 5	The scientific reasoning for how the extent of potential habitat for the Golden Sun Moth was derived is not sufficient. Scientific reasoning that would be accepted are up to date surveys. If new surveys are conducted, update the relevant maps as required.	Not met
3.1.7	The total area (in hectares) and quality of habitat to be impacted, and the science informing these areas and impacts.	4.2.1 5.1.2		Met
3.1.8	Provide the scientific reasoning for how the extent of potential habitat for the GSM was derived.	4.1.2.1 4.2.1 5.1.2		Met
Striped Legless Lizard *Delma impar* – Vulnerable				
3.1.9	Provide mapping which includes an overlay of the project footprint and potential habitat of Striped Legless Lizard (SLL) derived from desktop analysis and field surveys.	4.2.2 Figure 6		Met
3.1.10	Results from targeted surveys to confirm the status and extent of SLL habitat within and adjacent to the area of the proposed action, undertaken in accordance with the survey guidelines in *Survey guidelines for Australia's threatened reptiles*. Provide the	4.1.2.2 4.2.2 4.3.2	The scientific reasoning for how the extent of potential habitat for the Striped Legless Lizard was derived is not sufficient.	Not met

	scientific reasoning for how the extent of potential habitat for the Striped Legless Lizard was derived.	Figure 6	Scientific reasoning that would be accepted are up to date surveys. If new surveys are conducted, update the relevant maps as required.	
3.1.11	The total area (in hectares) and quality of habitat to be impacted, and the science informing these areas and impacts.	4.2.2 5.1.3		Met
3.1.12	An assessment of the adequacy of any surveys undertaken (including survey effort, timing and accordance with department's relevant scientific and policy guidance).	4.2.2 5.1.3		Met
Natural Temperate Grassland of the Victorian Volcanic Plain – Critically Endangered				
3.1.13	Assessment of all habitat's specific features available in the area of the proposed action as per the habitat described in the *Approved Conservation Advice for Natural Temperate Grassland of the Victorian Volcanic Plain*.	4.1.1 4.3.1 5.1.4	Appendix C states a native grassland assessment was undertaken. The methodology does not describe how the mapping achieved the high resolution of habitat areas illustrated in Figure 2 of Appendix C. Clarify why the northern portion of the site was not surveyed. Please provide the site investigation report undertaken by Biosis on 16 December 2022.	Not met

3.1.14	Provide the scientific reasoning for how the extent of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) is derived.	4.1.1 4.3.1 5.1.4	Appendix C states a native grassland assessment was undertaken. The methodology does not describe how the mapping achieved the high resolution of habitat areas illustrated in Figure 2 of Appendix C. Clarify why the northern portion of the site was not surveyed. Please provide the site investigation report undertaken by Biosis on 16 December 2022.	Not met
3.1.15	The total area (in hectares) and quality of NTGVVP to be impacted, and the science informing these areas and impacts.	4.1.1 4.3.1 5.1.4 Figure 8 Appendix C	Appendix C states a native grassland assessment was undertaken. The methodology does not describe how the mapping achieved the high resolution of habitat areas illustrated in Figure 2 of Appendix C. It is also unclear why the northern portion of the site was not surveyed. Please provide the site investigation report undertaken by Biosis on 16 December 2022.	Not met

3.1.16	Substantiated evidence that 'no-go zones' and buffer zones would protect areas of NTGVVP outside the area of the proposed action.	5.1.4 6.2		Met
Victorian Grassland Earless Dragon *Tympanocryptis pinguicolla* – Critically Endangered				
3.1.17	Assessment of all the habitat's specific features available in the area of the proposed action as per the habitat described in the *Approved Conservation Advice for* Tympanocryptis pinguicolla (*Victorian grassland earless dragon*) and in line with the habitat and diet requirements from the *Draft National Recovery Plan for Four Grassland Earless Dragons (*Tympanocryptis spp.*) of Southeast Australia*.	4.2.4 4.3.2 Appendix D		Met
3.1.18	Provide the scientific reasoning for how the extent of known and unknown potential habitat for the Victorian Grassland Earless Dragon were derived.	4.1.2.3 4.2.4 4.3.2 Appendix D		Met
3.1.19	Provide an assessment of the likely impacts to the Victorian Grassland Earless Dragon.	5.1.5 Appendix D		Met
Growling Grass Frog *Litoria raniformis* - Vulnerable				
3.1.20	Provide mapping which includes an overlay of the project footprint and potential habitat of Growling Grass Frog derived from desktop analysis and field surveys.	4.2.3	The scientific reasoning for how the extent of potential habitat for the	Not met

		Figure 7	Growling Grass Frog was derived is not sufficient. Scientific reasoning that would be accepted are up to date surveys. If new surveys are conducted, update the relevant maps as required.	
3.1.21	An assessment of the potential direct or indirect impacts (including downstream impacts), and the science informing these areas and impacts.	4.1.2.4		Met

3.2 The Environment of Commonwealth Land

Based on the information provided in your referral, and other available information, the Department of Climate Change, Energy, Environment and Water considers that the proposed action is likely to have a significant impact on the environment of Commonwealth land.

Information required: Impacts to the environment of Commonwealth land		**Section of PD addressing item**	**DCCEEW response**	**Item met / not met**
3.2.1	For actions impacting on Commonwealth land, the preliminary documentation will need to identify and evaluate impacts to the environment as described under section 526 of the EPBC Act (Appendix C).	5.2		Met
3.2.2	Information regarding characterisation of site contamination. This should be in the form of a preliminary site investigation (PSI) and, if considered necessary, a detailed site investigation	5.2	Please provide evidence of the site contamination assessment for PFAS concentrations at the project site.	Not met

	(DSI), undertaken in accordance with National Environment Protection (Assessment of Site Contamination) 1999 ("the ASC NEPM"), the PFAS National Environmental Management Plan 2.0 (as amended from time to time), and the National Water Quality Management Strategy (NWQMS). The assessments should include but not be limited to: • site history, physical setting, and site conditions. • a conceptual site model (CSM) regarding contamination sources, receptors and exposure pathways between those sources and receptors. • characterisation of chemical contamination at the are of the proposed action. • analytical results of laboratory analysis should also be provided in an ESdat compatible format. Information and data regarding the proposed works, with emphasis on those with the potential to disturb and/or remobilise contamination. This should include, but not be limited to, the following: • the locations and depths of any earthworks, including whether groundwater is expected to be intersected. • the expected volumes of potential contaminated materials, if any, to be produced including soil, water and hardstand material, and the fate of such material. • the expected duration of excavations / bare earth being exposed. • assessment of environmental suitability of any fill material proposed to be imported onto the site.		Please provide copies of referenced, site contamination reports, clearly specifying which reports relate to which project site.	

	Mitigation measures and management protocols proposed to be implemented to protect the environment during the proposed action. This should include, but not be limited to, the following: • measures to prevent and / or manage any potential for mobilisation of PFAS and other contaminants. • known / likely trenching operations, stockpile sites, laydown / cleared areas, access areas, disturbed soil areas, etc. • a commitment to ensuring that the vehicle hygiene, risk-based management, on-site stockpiling, storage and containment, transport of PFAS contaminated materials is consistent with the guidance in the PFAS NEMP 2.0 (HEPA 2020: 46-60), as updated from time to time. Further, consideration could be given to the need for: • a Construction Environmental Management plan (CEMP), including an unexpected finds protocol (UFP). • Airport Environment Officer (AEO) review of Melbourne Airport's PFAS Management Framework.			

3.3 Cumulative impacts

The preliminary documentation should identify and address cumulative impacts where potential project impacts are in addition to existing impacts of other activities, known potential future expansions or developments by the proponent and other proponents in the airport are approved or where development applications have been submitted. Cumulative impacts must be considered in terms of the potential overall consequence or magnitude of impacts on each of the MNES.

Information required		Section of PD addressing item	DCCEEW response	Item met / not met
3.3.1	Review and analysis of residual impacts of the proposed action, and of other known proposals within the larger Melbourne Airport site.	5.3		Met
3.3.2	Consideration of the potential for cumulative impacts on the resilience of any threatened species and ecological communities in the airport, and on overall habitat quality and availability.	5.3		Met
3.3.3	Discussion of the potential for existing pressures and threats to be exacerbated by the project.	5.3		Met

4. AVOIDANCE, MITIGATION AND MANAGEMENT MEASURES

Background

Avoidance and mitigation measures are the primary methods of eliminating and reducing significant impacts on MNES. Where possible and practicable, it is best to avoid impacts. If impacts cannot be avoided, then they should be minimised or mitigated as much as possible. Avoidance and mitigation measures must be investigated thoroughly as a part of the assessment and be supported by evidence to demonstrate likely success.

Management commitments by the person proposing to take the action must be clearly distinguished from recommendations or statements of best practice made by the document author or other technical expert.

The SPRAT Database, and associated statutory documents, may provide relevant mitigation measures for listed threatened species and ecological communities and listed migratory species.

The department notes the referral includes a description of the proposed avoidance, mitigation and management measures to be implemented by the proponent during the construction, operation and maintenance stages of the proposed action.

Information required		Section of PD addressing item	DCCEEW response	Item met / not met
4.1	A detailed summary of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of the proposed action. This should include for each measure: i. A statement of the objectives, ongoing management and monitoring, locations and timing ii. The party responsible iii. The policy basis, for instance, consideration of the *PFAS National Environment Management Plan 2.0*	6.0		Met
4.2	The proposed measures must be based on best available practices, appropriate standards, evidence of success for other similar actions and supported by published scientific evidence.	6.0		Met
4.3	All proposed measures to manage impacts must be drafted to meet the 'S.M.A.R.T' principle: • S – Specific (what and how) • M – Measurable (baseline information, number/value, auditable) • A – Achievable (timeframe, money, personnel)	6.0		

	• R – Relevant (conservation advice, recovery plans, threat abatement plans) • T – Time-bound (specific timeframe to complete)			
4.4	The details of the vegetation and species habitat to be retained and an associated map showing the retained vegetation and habitat. The information and mapping must include the location and quantification of the total area of retained vegetation and species habitat when acting in combination with past, present, and reasonably foreseeable projects at the Airport.	6.2 6.3 Figure 4		Met

5. OFFSETS

Background

Environmental offsets are measures that compensate for the residual significant impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after consideration of avoidance and mitigation measures. It is important to consider environmental offsets early in the assessment process. Correspondence with the department regarding offsetting is highly encouraged. The department's *EPBC Act Environmental Offsets Policy* (2012) (Offsets Policy) is available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

Information required		**Section of PD addressing item**	**DCCEEW response**	**Item met / not met**
5.1	An assessment of the likelihood of residual significant impacts occurring on relevant MNES, after avoidance, mitigation and management measures have been applied.	7.0		Met

5.2	If residual impacts are likely to be significant, please provide details of an offset strategy proposed to be implemented to compensate for the residual significant impacts of the project.	7.0	The Strategy should start by summarising the impacts to MNES as established in the previous sections of the PD (you can refer to previous sections). It can then summarise the management measures inherent in the design (avoid) and the management documents (mitigate) that will be implemented by APAM to avoid and mitigate impacts. This enables the residual impact to be quantified and summarised. Then describe the offset proposal (if you have multiple sites, describe each in turn): a. Type of offsets proposed. b. Extent to which the proposed offset actions correlate to and adequately compensate for the significant residual impacts of the proposed action on each particular matter. c. Suitability of the location of any proposed offset site. Include a discussion of the suitability of a site for each particular matter if it is located away from the action site. d. Conservation gain to be achieved by the offset, i.e. positive management strategies that improve the site and/or	Not met

			avert the future loss, degradation or damage to the particular matter. e. Time it will take to achieve the proposed conservation gain. f. Level of certainty that the proposed offset will be successful. g. Current land tenure of any proposed offset and the method of securing and managing the offset for the life of the impact.	
5.3	Where offset area/s have been nominated to compensate for the residual significant impacts, provide an Offset Management Plan (OMP) as an appendix to the PD. You may wish to propose an advanced offset for the project plus the cumulative impacts of reasonably foreseeable projects across the airport. The OMP must meet the information requirements set out in Appendix B, and must be prepared by a suitably qualified ecologist and in accordance with the department's *Environmental Management Plan Guidelines* (2014), available at: www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines.	7.0	OMP not provided	Not met (Required prior to final decision)

6. ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

Information required	Section of PD addressing item	DCCEEW response	Item met / not met

6.1	A description of how the proposed action meets the principles of ESD, as defined in section 3A of the EPBC Act. The following principles are ***principles of ecologically sustainable development***: • decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations. • 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 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 conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making. • improved valuation, pricing and incentive mechanisms should be promoted.	8.0		Met

7. ECONOMIC AND SOCIAL MATTERS

Information required	Section of PD addressing item	DCCEEW response	Item met / not met

7.1	An analysis of the economic and social impacts of the action, both positive and negative.	3.1 9.1		Met
7.2	Details of any public consultation activities undertaken and their outcomes.	9.2.1		Met
7.3	Details of any consultation with Indigenous stakeholders. **Indigenous engagement** Identify existing or potential native title rights and interests, including any areas and objects that are of particular significance to Indigenous peoples and communities, possibly impacted by the proposed action and the potential for managing those impacts. Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. The department considers that best practice consultation, in accordance with the Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999 (dcceew.gov.au) includes: • identifying and acknowledging all relevant affected Indigenous peoples and communities. • committing to early engagement.	9.2.2		Met

	• building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management. • setting appropriate timeframes for consultation; and • demonstrating cultural awareness. Describe any state requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regards to Indigenous peoples and communities.			
7.4	Projected economic costs and benefits of the project, including the basis for their estimate through cost/benefit analysis or similar studies.	9.3		Met
7.5	Employment opportunities expected to be generated by the project (including construction and operational phases).	9.4		Met

ENVIRONMENTAL RECORD OF THE PERSON PROPOSING TO TAKE THE ACTION

Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

Information required		**Section of PD addressing item**	**DCCEEW response**	**Item met / not met**
8.1	The person proposing to take the action;	10.0		Met

8.2	For an action for which a person has applied for a permit, the person making the application;	10.0		Met
8.3	If the person is a body corporate—the history of its executive officers in relation to environmental matters; and	10.0		Met
8.4	If the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers.	10.0		Met

9. CONCLUSION

Please provide an overall conclusion as to the environmental acceptability of the proposal with regards to the objects and requirements of the EPBC Act including the principles of Ecologically Sustainable Development (ESD). You may wish to include a statement as to whether or not the controlled action should be approved and may recommend conditions pertaining to an approval. This should include justification for undertaking the proposed action in the manner proposed.

10. INFORMATION SOURCES

The preliminary documentation must state for the information provided, the following:

a) The source and currency (date) of the information.

b) How the reliability of the information was tested.

c) The uncertainties (if any) in the information.

d) The guidelines, plans and/or policies considered.

Appendix G: Sky Road West Preliminary Documentation: Targeted survey results (Biosis 2026a)

Sky Road West Preliminary Documentation

Targeted survey results

Draft Report

Prepared for Australia Pacific Airports (Melbourne) Pty Ltd.

7 May 2026

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- [redacted]
- [redacted] (mapping)
- [redacted] (quality assurance)

Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.

We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.

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Contents

Contents ii
1 Introduction 1
1.1 Project background 1
2 Methods 3
2.1 Vegetation assessment 3
2.1.1 Assessment against NTGVVP thresholds 3
2.1.2 Assessing quality of Natural Temperate Grassland 3
2.1.3 Limitations and uncertainty 3
2.2 Striped Legless Lizard 3
2.3 Golden Sun Moth 4
2.3.1 Determining flight season commencement 4
2.3.2 Targeted survey 4
2.3.3 Weather conditions 5
2.3.4 Qualifications 5
2.4 Growling Grass Frog 5
2.5 Permits 6
2.6 Mapping 6
3 Results 7
3.1 Vegetation 7
3.1.1 NTGVVP Assessment 7
3.1.2 Vegetation quality assessment 9
3.2 Striped Legless Lizard 10
3.3 Golden Sun Moth 11
3.4 Growling Grass Frog 12
4 Figures 13
References 17
Appendices 18
Appendix 1 Targeted survey weather condition data 19
Appendix 2 Photos 21

Tables

Table 1 Summary of DCCEEW additional information and Biosis response 1
Table 2 Assessment of habitat zones 2 and 4 against Key Diagnostic Characteristics from the listing advice and whether patches within the impact area qualify (TSSC 2008). 8
Table 3 Assessment of habitat zones against the NTGVVP condition thresholds 9
Table 4 Summary of habitat zones recorded at Sky Road and assessment against the key diagnostic characteristics and condition thresholds stated in the conservation listing advice. 9
Table 5 Vegetation quality assessment of NTGVVP recorded in the study area 10

Table 6 Striped Legless Lizard targeted survey result summary at Sky Road West 11
Table 7 Striped Legless Lizard survey details Sky Road West 19
Table 8 Golden Sun Moth survey details 20
Table 9 Growling Grass Frog survey data 20

Figures

Figure 1 Location of the study area - Sky Road, Melbourne Airport, Victoria 14
Figure 2 Fauna survey effort 15
Figure 3 Natural Temperate Grassland within the study area 16

Photos

Photo 1 NTGVVP dominated by Wallaby Grasses *Rytidosperma* spp. (Habitat Zone 4). Photo taken 10 December 2025. 21
Photo 2 Wallaby Grass as the dominant native species within a patch of NTGVVP. Photo taken 10 December 2025. 21
Photo 3 Predominantly introduced vegetation consisting of Chilean Needle-grass. 22

1 Introduction

1.1 Project background

Biosis Pty Ltd was engaged by Australia Pacific Airports (Melbourne) Pty Ltd to undertake targeted surveys for the Sky Road West warehouse development project at Melbourne Airport (Figure 1) for the following matters listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- Natural Temperate Grassland of the Victorian Volcanic Plain (Natural Temperate Grassland or NTGVVP) ecological community (critically endangered)
- Striped Legless Lizard *Delma impar* (vulnerable)
- Golden Sun Moth *Synemon plana* (vulnerable)
- Growling Grass Frog *Litoria raniformis* (vulnerable).

The Sky Road West project is currently being assessed under the EPBC Act (EPBC 2023/09633) via a Preliminary Documentation report prepared by Senversa (2024). Comments were received in 2025 from the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) that queried the validity of previous survey effort and mapping for threatened fauna. Biosis prepared a detailed response (Biosis 2025) justifying our assessment that these species are unlikely to occur, but also recommended targeted surveys be undertaken to ensure certainty. Targeted surveys were therefore undertaken for Striped Legless Lizard, Golden Sun Moth and Growling Grass Frog within the study area. A vegetation assessment was also undertaken within the northern portion of the study area to map the presence and extent of native vegetation including Natural Temperate Grassland.

Table 1 presents the additional information requested by DCCEEW in order to assess the project by preliminary documentation, along with a summary response and a reference to where further supporting detail can be found within this report.

Table 1 Summary of DCCEEW additional information and Biosis response

Information required for assessment by Preliminary Documentation	DCCEEW response to preliminary documentation report	Biosis response	Section within this report
Natural Temperate Grassland of the Victorian Volcanic Plain			
Assessment of all habitat specific features available in the area of the proposed action as per the habitat described in the *Approved Conservation Advice for Natural Temperate Grassland of the Victorian Volcanic Plain.*	Appendix C of the Preliminary Documentation Report by Senversa (2024) states a native grassland assessment was undertaken. The methodology does not describe how the mapping achieved the high resolution of habitat areas illustrated in Figure 2 of Appendix C. Clarify why the northern portion of the site was not surveyed. Please	An updated vegetation assessment was completed in December 2025. Figure 3 represents the ecological features within the northern portion of the study area.	Figure 3 Section 3.1
Provide the scientific reasoning for how the extent of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) is derived.		Methods updated to provide scientific reasoning for how NTGVVP is derived.	Section 2.1

Information required for assessment by Preliminary Documentation	DCCEEW response to preliminary documentation report	Biosis response	Section within this report
The total area (in hectares) and quality of NTGVVP to be impacted, and the science informing these areas and impacts.	provide the site investigation report undertaken by Biosis on 16 December 2022.	1.13 hectares of NTGVVP to be impacted in the northern section of the study area.	Section 3.1.1
Striped Legless Lizard *Delma impar*			
Results from targeted surveys to confirm the status and extent of Striped Legless Lizard habitat within and adjacent to the area of the proposed action, undertaken in accordance with the survey guidelines in *Survey guidelines for Australia's threatened reptiles*. Provide the scientific reasoning for how the extent of potential habitat for the Striped Legless Lizard was derived.	The scientific reasoning for how the extent of potential habitat for the Striped Legless Lizard was derived is not sufficient. Scientific reasoning that would be accepted are up to date surveys. If new surveys are conducted, update the relevant maps as required.	Striped Legless Lizard surveys were undertaken over spring and summer 2025, and the species was not recorded within the study area.	Section 2.2 Figure 2 Section 3.2
Golden Sun Moth *Synemon plana*			
Results from targeted surveys to confirm the status and extent of Golden Sun Moth habitat within and adjacent to the area of the proposed action, undertaken in accordance with the survey guidelines outlined in the *Significant impact guidelines for the critically endangered Golden Sun Moth* (*Synemon plana*). Provide the scientific reasoning for how the extent of potential habitat for the Golden Sun Moth was derived.	The scientific reasoning for how the extent of potential habitat for the Golden Sun Moth was derived is not sufficient. Scientific reasoning that would be accepted are up to date surveys. If new surveys are conducted, update the relevant maps as required.	Golden Sun Moth surveys were undertaken in November and December 2025, and the species was not recorded within the study area.	Section 2.3 Figure 2 Section 3.3
Growling Grass Frog *Litoria raniformis*			
Provide mapping which indicates an overlay of the project footprint and potential habitat of Growling Grass Frog derived from desktop analysis and field surveys.	The scientific reasoning for how the extent of potential habitat for the Growling Grass Frog was derived is not sufficient. Scientific reasoning that would be accepted are up to date surveys. If new surveys are conducted, update the relevant maps as required.	Growling Grass Frog surveys were undertaken in December 2025, and the species was not recorded within or adjacent to the study area. Growling Grass Frog is unlikely to occur within the study area, therefore no potential habitat for the species is present within the study area.	Section 2.4 Figure 2 Section 3.4

2 Methods

2.1 Vegetation assessment

A vegetation assessment was undertaken on 10 December 2025 by a Senior Botanist to assess the presence, extent and quality of the Natural Temperate Grassland of the Victorian Volcanic Plain ecological community within the northern portion of the study area (Figure 1).

Vegetation within the study area was assessed and recorded using hand-held GPS-enabled tablets. Native vegetation is defined in the Victorian Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses' (Clause 73.01). Patches of native vegetation, classified under the Guidelines as an area of native vegetation, with or without trees, where at least 25% of the total perennial understorey cover is native plants. An Ecological Vegetation Class (EVC) was then assigned to each patch of native vegetation.

2.1.1 Assessment against NTGVVP thresholds

All patches of Plains Grassland EVC 132 were assessed against the size and condition thresholds as defined in the NTGVVP listing advice (TSSC 2008). The Description and Condition Thresholds of an ecological community in the EPBC Act listing advice provide the definitive source of information for identifying nationally threatened ecological communities (TSSC 2008). The results of the size and condition threshold analysis are presented in Section 2.1.

2.1.2 Assessing quality of Natural Temperate Grassland

Vegetation Quality Assessments (VQA) were undertaken for all patches of native vegetation corresponding to NTGVVP, which was based on DEECA's habitat hectare method (DSE 2004). DCCEEW has previously endorsed the habitat hectare method as an appropriate means of assessing the condition of Natural Temperate Grassland. VQA scores were not assigned to grassland patches that did not meet the criteria for Natural Temperate Grassland.

For the purposes of this assessment, the limit of resolution for identification of a patch of native vegetation was taken to be 0.001 habitat hectares. That is, if a discrete patch of native vegetation was present with sufficient cover but its condition and extent would not have resulted in the identification of at least 0.001 habitat hectares, the patch of vegetation was not mapped or included in the assessment.

2.1.3 Limitations and uncertainty

There are no significant limitations or uncertainties associated with this vegetation assessment. The assessment was conducted at an appropriate time of the year for assessment of grassland vegetation (which is typically spring or early summer). However, while this report has been developed using the most recent spatial data available to Biosis, inaccuracies within the publicly available datasets may occur.

2.2 Striped Legless Lizard

Surveys for Striped Legless Lizard were conducted using the artificial shelter (tile survey) technique. The tile survey technique is recognised as the most effective method to survey for Striped Legless Lizard and is

accepted by DCCEEW when undertaken in accordance with the *Survey guidelines for Australia's threatened reptiles* (DSEWPC 2011a) and the EPBC Act referral guidelines for the species (DSEWPC 2011b).

A total of eight tile survey arrays were deployed over three days on 19, 25 and 28 August 2025. Each array consisted of 50 terracotta roof tiles existing as a 10 by 5 grid (i.e. 400 tiles in total). Tiles were spaced 5 metres apart and placed within the study area to correspond with areas identified as supporting potentially suitable habitat, which included patches of Plains Grassland EVC 132 and/or NTGVVP, or areas of dense tussock-forming grasses.

Tile checks were undertaken over 10 repeat visits on 29 September 2025; 7, 15, 21 and 30 October 2025; 7, 13 and 21 November 2025 and 10 and 17 December 2025. Transects were sampled across a variety of weather conditions, at times when ambient temperatures did not exceed 28°C. All vertebrate species encountered within the study area were recorded using hand-held GPS-enabled tablets.

2.3 Golden Sun Moth

The Sky Road West study area was previously assessed by Biosis (2025b) as unlikely to support Golden Sun Moth, based on the results of previous targeted survey effort within and adjacent to the study area, as well as the land management and disturbance history of the site. However, for additional certainty, and in order to respond to DCCEEW's request, targeted survey was undertaken throughout the study area during the 2025 flight season for Golden Sun Moth. As the timing of the flight season varies annually and geographically, commencement of the flight season needed to be determined before survey could be undertaken.

2.3.1 Determining flight season commencement

The best indicator of the key survey period for Golden Sun Moth is the presence of flying males at known local sites. Pre-season checks were undertaken by Biosis and other ecological consultants at various known sites (reference sites) around Melbourne from late October to collaboratively determine the commencement of the 2025 flight season for the species. Golden Sun Moth began being reliably recorded flying at nearby reference sites (Broadmeadows) from 13 November 2025.

2.3.2 Targeted survey

Surveys were undertaken in accordance with *EPBC Act policy statement 3.12*: *Significant Impact Guidelines for the Critically Endangered Golden Sun Moth* (Synemon plana) (DEWHA 2009).

The entire study area was subject to Golden Sun Moth survey, due to the extent and distribution of potentially suitable habitat. Survey was undertaken on 25 November, and 5, 12 and 29 December 2025. Where weather conditions allowed, the surveys were spaced approximately one week apart to allow for variations in emergence patterns. Surveys took place when conditions were suitable for male flight (generally >20^{o}C by 10am and throughout the survey, bright, clear days, minimal cloud cover, absence of rain and wind other than a light breeze) between 10:00 hrs and 15:00 hrs.

The site was surveyed systematically by qualified and experienced zoologists walking the site in a series of transects spaced no more than 50 metres apart. Tracks were recorded using a Garmin GPS and/or GPS enabled tablet (Figure 2). All surveys were undertaken after confirming Golden Sun Moth were actively flying at a nearby reference site at Broadmeadows Valley Park in Broadmeadows.

2.3.3 Weather conditions

Weather conditions, including air temperature, humidity and wind speed were measured on site using a Kestrel Weather Meter (Model 300 or 4000). Weather data collected on site is provided in Appendix 1 (Table 8).

2.3.4 Qualifications

The difficulty in determining presence/absence of Golden Sun Moth within a given area is well documented, and it is known that emergence patterns in this species can vary markedly within and between seasons (Gibson & New 2007).

However, to account for the difficulties associated with Golden Sun Moth survey to the greatest extent possible, surveys were undertaken on days within the confirmed flight season and on days when Golden Sun Moth were observed flying at reference sites around Melbourne. For further information regarding the limitations associated Golden Sun Moth surveys see Gibson & New (2007).

The 2025 Golden Sun Moth active period began earlier than previous years but experienced unseasonably cool and wet conditions. Although surveys are usually conducted weekly, two of the current surveys were required to be more than a week apart due weather conditions. However, this is not expected to have a significant impact on the survey effort or results, as the surveys were undertaken under suitable weather conditions, on days where Golden Sun Moth were observed flying in sufficient numbers at local reference sites. Furthermore, the study area has been subject to survey effort in previous seasons, which further strengthens the confidence in a true negative survey result.

2.4 Growling Grass Frog

The Preliminary Documentation report prepared by Senversa (2024) describes the current status of Growling Grass Frog habitat within the project area as unlikely to provide suitable habitat for the species. The associated mapping, however, displayed linear areas of potential dispersal and ephemeral habitat for Growling Grass Frog within and immediately adjacent to the study area. To clarify the presence, extent and quality of habitat for Growling Grass Frog, and species presence, an updated habitat assessment and targeted surveys were undertaken in December 2025.

An initial habitat assessment was undertaken on 17 December 2025, which consisted of a walkover of all areas within the study area that were previously mapped as potential dispersal and ephemeral habitat for Growling Grass Frog. General observations on the presence, extent and quality of potential habitat were noted, including the presence of aquatic vegetation, refugia, water levels and permanence, and habitat connectivity.

Biosis then undertook targeted Growling Grass Frog surveys at the study area on 17 and 18 December 2025 to determine the presence or absence of Growling Grass Frog during the species' active calling period.

Targeted nocturnal surveys for Growling Grass Frog were undertaken in accordance with the approved survey guidelines for the Growling Grass Frog (DEWHA 2010, DEWHA 2009), as follows:

- Undertaken during the peak activity period for the species (between November and March).
- Undertaken over two nights in suitable weather conditions for male frogs to be vocalising (daytime air temperatures greater than 15ºC, nighttime air temperatures greater than 12ºC, with little or no wind).
- Include listening for vocalisations, call playback and searching of suitable habitat using spotlights.

In addition, a known Growling Grass Frog population was visited as a reference site, in order to confirm that the species was active, calling and readily detectable on the same evening and under the same conditions. The reference site that was visited in this instance is located within Deep Creek at Trap Street Reserve, Bulla, which is located approximately 8.5 kilometres north-west of the study area. Growling Grass Frogs were confirmed as active and detectable at this reference site during the targeted surveys.

2.5 Permits

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Permit to Take/Keep Protected Flora issued by DEECA under the FFG Act (Permit Number 10011236).
- Wildlife Authorisation issued by DEECA under the Victorian *Wildlife Act 1975* (Permit Number 10011235).
- Approvals 27.24 and 28.24 issued by the Wildlife and Small Institutions Animal Ethics Committee of the Victorian Government.
- Scientific Procedures Fieldwork Licence issued by the Victorian Government Wildlife and Small Institutions Animal Ethics Committee (Licence Number 20020).

All fauna and flora records will be submitted to DEECA for incorporation into the Victorian Biodiversity Atlas (DEECA 2025), in accordance with permit conditions.

2.6 Mapping

Mapping was conducted using hand-held GPS-enabled smart devices and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the devices (generally ±7 metres) and dependent on the limitations of aerial photo rectification and registration.

3 Results

3.1 Vegetation

The vegetation within the northern portion of the study area (Figure 1) is highly modified due to the history of previous land management including regular mowing/slashing (and likely grazing) and the level of industrial development within the immediate vicinity (i.e. the construction of warehouses, roads and buildings). Despite the level of disturbance, patches of native vegetation persist within the study area. Areas where at least 25 percent of the total perennial understorey cover consists of native plants were mapped as patches of Plains Grassland, in accordance with Victoria's Biodiversity Assessment Guidelines (DELWP 2017). The patches of Plains Grassland identified during this assessment are all dominated by native grasses of the genera *Austrostipa* and *Rytidosperma*.

The northern portion of the study area supports predominantly introduced vegetation, as well as patches of native vegetation that represents Plains Grassland EVC 132 (some of which qualify as NTGVVP; Figure 3).

Predominately introduced vegetation within the northern portion of the study area is comprised of introduced grasses and forbs, including high threat weed species such as Chilean Needle-grass *Nassella neesiana,* Cane Needle-grass *Nassella hyalina* and Serrated Tussock *Nassella trichotoma*.

Patches of native vegetation mapped as Plains Grassland EVC 132 (but did not qualify as NTGVVP; see section 3.1.1; Figure 3), are characterised as species poor, low quality native grasslands. Native flora species that persist include Bristly Wallaby-grass *Rytidosperma setaceum* and Windmill Grass *Chloris truncata*. This is represented in habitat zones 1 and 3.

Higher quality patches of Plains Grassland that are dominated by Leafy Wallaby-grass *Rytidosperma bipartitum*, Bristly Wallaby-grass and Kneed Spear-grass *Austrostipa bigeniculata* correspond with Natural Temperate Grassland. Occasional herb and sub shrubs are interspersed, including Berry Saltbush *Atriplex semibaccata*, Grassland Wood-sorrel *Oxalis perennans* and Flat Spurge *Euphorbia dallachyana.* Scattered exotics such as Chilean Needle-grass and Ribwort *Plantago lanceolata* are present. NTGVVP is represented in habitat zone 2 and 4.

The northern portion of the study area contains approximately 1.30 hectares of Plains Grassland. Within this area, two patches of NTGVVP were recorded that meet the size and condition thresholds outlined in TSSC (2008), totalling 1.13 hectares (Figure 3).

3.1.1 NTGVVP Assessment

The NTGVVP ecological community is listed as critically endangered under the EPBC Act. NTGVVP is endemic to south-western Victoria. The vegetation is mostly limited to a ground layer of grasses and herbs. Large shrubs and trees are absent to sparse (DSEWPC 2011c). NTGVVP occurs in a number of areas at Melbourne Airport, in varying patch size and quality. The majority of NTGVVP at Melbourne Airport is substantially degraded and previously disturbed due to the development of Melbourne Airport, grazing activities on adjacent land and the introduction and spread of exotic plant species (Biosis 2015).

Mapping during the current assessment has refined the boundaries of the Sky Road West grassland communities. Two patches of native vegetation were identified that meet the size and condition thresholds to qualify as NTGVVP (Table 4; Figure 3). The assessment of Plains Grassland habitat zones against the key

diagnostic characteristics for NTGVVP are presented below in Table 2. The two patches of Natural Temperate Grassland total an area of 1.13 hectares.

Table 2 Assessment of habitat zones 2 and 4 against Key Diagnostic Characteristics from the listing advice and whether patches within the impact area qualify (TSSC 2008).

Key Diagnostic Characteristics	HZ 1	HZ 2	HZ 3	HZ 4
The grassland is mainly associated with Quaternary basalt soils within the Victorian Volcanic Plain IBRA bioregion. Pockets of similar grassland extend into the adjacent Victorian Midlands and South-east Coastal Plain bioregions. These are included in the listed ecological community if they meet the other key diagnostic characteristics and condition thresholds.	Yes. Study area is on the Victorian Volcanic Plain and soil description matches study area.			
At least one of the following grass genera is the dominant native species in the ground layer: *Themeda* (Kangaroo-grass), *Rytidosperma* (Wallaby-grass), *Austrostipa* (Spear-grass) and/or *Poa* (Tussock-grass).	No	Yes (*Austrostipa* and *Rytidosperma* spp. are the dominant native species)	No	Yes (*Austrostipa* and *Rytidosperma* spp. are the dominant native species)
Area extents: • **For a native vegetation remnant ≤1 hectare in size, the minimum contiguous size of the grassland patch is 0.05 hectare and the crown cover of shrubs and trees over one metre tall within the grassland patch should not exceed 5%;** • **For a native vegetation remnant >1 hectare in size, the minimum contiguous size of a grassland patch is 0.5 hectare and the density of mature trees within the grassland patch should not exceed 2 trees per hectare.**	No The size of the remnant patch is <1 hectare, this threshold is not met as the grassland patch is < 0.05 hectare (i.e.: 0.01 hectares)	Yes The size of the native vegetation remnant is >1 hectare, this threshold is met as the grassland patch is >0.5 hectares (i.e. 1.04 hectares).	Yes The size of the remnant patch is <1 hectare, this threshold is met as the grassland patch is > 0.05 hectare (i.e.: 0.17 hectares)	Yes The size of the remnant patch is <1 hectare, this threshold is met as the grassland patch is > 0.05 hectare (i.e.: 0.09 hectares)

Patches of Plains Grassland that met the key diagnostic characteristics for NTGVVP were then assessed against the condition thresholds outlined in the NTGVVP listing advice (TSSC 2008). The results of this assessment are summarised in Table 3 below.

Table 3 Assessment of habitat zones against the NTGVVP condition thresholds

Condition threshold defined for NTGVVP	HZ 2	HZ 4
The total perennial tussock cover represented by the native grass genera *Themeda, Austrodanthonia (Rytidosperma), Austrostipa* or *Poa* is at least 50%;	Yes	Yes
Or, if the total perennial tussock cover represented by the above 4 native grass genera is less than 50%, then the ground cover of native forbs (wildflowers) is at least 50% of total vegetation cover during spring-summer (September to February);	No	No
Or, the cover of non-grass weeds is less than 30% of total vegetation cover at any time of the year.	Yes	Yes

A summary of the assessment against the key diagnostic characteristics and condition thresholds for all four habitat zones is summarised in Table 4 below.

Table 4 Summary of habitat zones recorded at Sky Road and assessment against the key diagnostic characteristics and condition thresholds stated in the conservation listing advice.

Habitat Zone	Size	EVC	Meets NTGVVP key diagnostic characteristics	Meets NTGVVP condition threshold	NTGVVP (yes or no)
1	0.01 ha	Plains Grassland (EVC 132)	**X**	**N/A**	No
2	1.04 ha	Plains Grassland (EVC 132)	**√**	**√**	Yes
3	0.17 ha	Plains Grassland (EVC 132)	**X**	**N/A**	No
4	0.09 ha	Plains Grassland (EVC 132)	**√**	**√**	Yes

3.1.2 Vegetation quality assessment

The two patches of native vegetation that qualified as NTGVVP (habitat zones 2 and 4) were scored using the Vegetation Quality Assessment method (DSE 2004) to determine the current condition of the native vegetation. Table 5 below provides the results of this assessment.

Table 5 Vegetation quality assessment of NTGVVP recorded in the study area

Site ID			Sky Road West (northern portion)	
Habitat Zone ID			HZ 2	HZ 4
EVC #: Name			132: Plains Grassland	
		Max Score	Score	Score
Site Condition	Large Trees	10	NA	NA
	Tree Canopy Cover	5	NA	NA
	Lack of Weeds	15	4	7
	Understorey	25	15	5
	Recruitment	10	6	6
	Organic Matter	5	5	3
	Logs	5	NA	NA
	Total Site Score		32	23
	EVC standardiser		1.36	1.36
	Adjusted Site Score		40.91	28.64
Landscape Value	Patch Size	10	1	1
	Neighbourhood	10	2	2
	Distance to Core Area	5	1	1
	Total Landscape Score		4	4
Habitat points = #/100		100	44.91	32.64
CONDITION SCORE		1	0.45	0.33

3.2 Striped Legless Lizard

Despite surveys being undertaken at the appropriate season and under a range of weather conditions (see Table 7 and Appendix 1) no Striped Legless Lizard were recorded during the targeted surveys.

Other vertebrate fauna recorded at Sky Road West during the artificial shelter (roof tile) surveys included Tussock Skink *Pseudemoia pagenstecheri,* Garden Skink *Lampropholis guichenoti*, Eastern Brown Snake *Pseudonaja textilis* and Tiger Snake *Notechis scutatus* (Table 6). Figure 3 shows the location of survey grids within the study area.

Therefore, on the basis of these survey results, it is unlikely that the study area supports a population of the species, and therefore unlikely that the proposed development will have an impact on Striped Legless Lizard. No further assessment is recommended for this species.

Table 6 Striped Legless Lizard targeted survey result summary at Sky Road West

Check	Date	Method	Species recorded and number	Location
1	29/09/2025	Tile grid	Unidentified skink	Grid 4
			Garden Skink *Lampropholis guichenotti*	Grid 6
2	07/10/2025	Tile grid	Unidentified skink x 3	Grid 4
			Unidentified skink	Grid 5
			Unidentified skink	Grid 6
3	15/10/2025	Tile grid	Unidentified skink	Grid 5
4	21/10/2025	Tile grid	Unidentified skink	Grid 2
			Eastern Brown Snake *Pseudonaja textilis*	Grid 3
			Unidentified skink x 2	Grid 6
			Tussock Skink *Pseudemoia pagenstecheri* x 4	Grid 6
5	30/10/2025	Tile grid	Tiger Snake *Notechis scutatus*	Grid 2
			Tussock Skink *Pseudemoia pagenstecheri*	Grid 5
			Tussock Skink *Pseudemoia pagenstecheri*	Grid 6
6	07/11/2025	Tile grid	Tussock Skink *Pseudemoia pagenstecheri*	Grid 1
			Eastern Brown Snake *Pseudonaja textilis*	Grid 3
			Tussock Skink *Pseudemoia pagenstecheri* x 2	Grid 5
			Tussock Skink *Pseudemoia pagenstecheri* x 2	Grid 6
			Garden Skink Lampropholis guichenotti	Grid 8
7	13/11/2025	Tile grid	Tussock Skink *Pseudemoia pagenstecheri*	Grid 2
			Eastern Brown Snake *Pseudonaja textilis*	Grid 3
			Tussock Skink *Pseudemoia pagenstecheri*	Grid 4
			Tussock Skink *Pseudemoia pagenstecheri*	Grid 5
			Tussock Skink *Pseudemoia pagenstecheri* x 2	Grid 6
8	21/11/2025	Tile grid	Tussock Skink *Pseudemoia pagenstecheri*	Grid 4
			Tussock Skink *Pseudemoia pagenstecheri*	Grid 6
9	01/12/2025	Tile grid	No fauna recorded	-
10	10/12/2025	Tile grid	Garden Skink *Lampropholis guichenotti*	Grid 5

3.3 Golden Sun Moth

The site supports Golden Sun Moth larval food plants Wallaby Grasses *Rytidosperma* spp. and Spear Grasses *Austrostipa* spp., however, is mostly composed of introduced grass species and weeds, including Perennial Rye Grass *Lolium perenne* and Ribwort *Plantago lanceolata*. The site also supports Chilean Needle-grass

Nassella neesiana and Serrated Tussock *Nassella trichotoma*, though these weed species are known to be Golden Sun Moth larval food plants and are therefore considered potential habitat for the species.

Despite surveys being undertaken at the appropriate time and during suitable conditions and on days when Golden Sun Moth were flying at other sites around Melbourne and Geelong (See Appendix 1 and Table 8), no Golden Sun Moth were recorded from the study area. The results suggest that a population of the species is unlikely to be present. This result is consistent with previous targeted surveys for Golden Sun Moth that have been undertaken within the study area and surrounding areas.

See Figure 2 showing the survey effort for Golden Sun Moth at Sky Road West.

3.4 Growling Grass Frog

The habitat within the study area was of a low quality for Growling Grass frog, lacking the suitable vegetation, structure and permanent water required for overwintering and breeding. Location one consisted of a drainage line adjacent to an industrial building. Locations two and three were at either end of where the aqueduct of Steel Creek flowed adjacent to the study area. Figure three shows the locations of Growling Grass Frog targeted surveys on 17 and 18 December 2025.

Surveys for Growling Grass Frog were undertaken in suitable weather conditions in line with the survey guidelines (Table 9). No Growling Grass Frog were recorded during the targeted surveys at the Sky Road West study area.

A group of Spotted Marsh Frogs *Limnodynastes tasmaniensis* were heard calling on both survey occasions with one being seen at Location two adjacent to Steele Creek and a single individual was observe on 18 December 2026 a location two. There were no records of frogs at location 3.

4 Figures

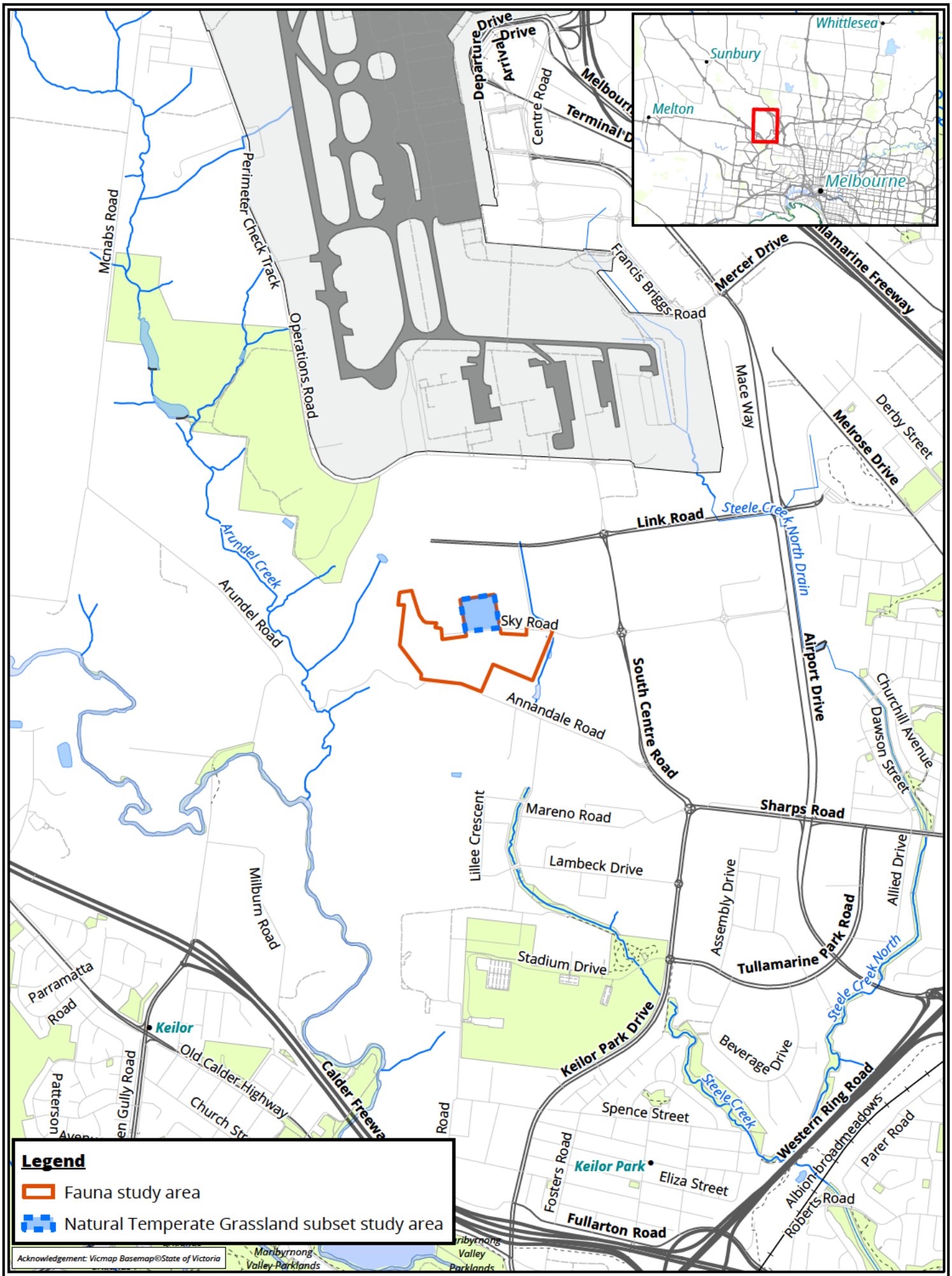
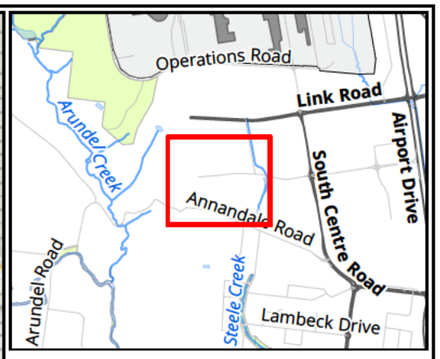


Figure 1 Location of the study area - Sky Road, Melbourne Airport, Victoria





Legend

- Study area
- Current parcel boundary
- Contour 10m interval

Golden Sun Moth survey tracks

- 25/11/2025
- 05/12/2025
- 12/12/2025
- 29/12/2025

Striped Legless Lizard survey

- Tile (roof) census

Growling Grass Frog survey

- Targeted survey point

Hydrology

- River or creek
- Watercourse area (natural double sided stream)

Figure 2 Fauna survey effort

0 20 40 60 80 100

Metres

Scale: 1:2,500 @ A3

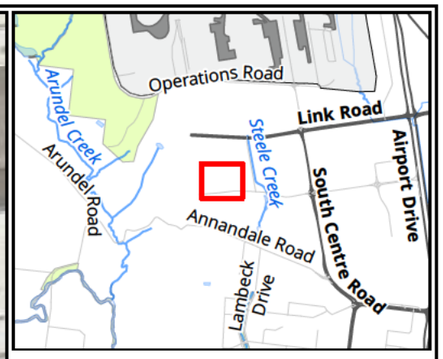
Coordinate System: GDA2020 MGA Zone 55

N

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APEM Group





Legend

- Natural Temperate Grassland subset study area
- Fauna study area
- Current parcel boundary
- Contour 10m interval

Ecological Vegetation Classes (EVCs)

- (VVP_0132_61) Heavier-soils Plains Grassland

Nationally threatened ecological communities (EPBC Act)

- Natural Temperate Grassland of the Victorian Volcanic Plain

Figure 3 Natural Temperate Grassland within the study area

0 10 20 30 40 50

Metres

Scale: 1:1,000 @ A3

Coordinate System: GDA2020 MGA Zone 55

N

biosis

APEM Group

Matter: 43386,
Date: 28 April 2026 ,
Prepared for: SB, Prepared by: PG, Last edited by: pgidley
Layout: 43386_F3_NTG
Project: P:\35900s\35971\Mapping\
43386_EEP_SkyRd_TargetedFauna.aprx

Acknowledgements: VicMap BaseMap©State of Victoria, Imagery Nearmap 2026

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Appendices

Appendix 1 Targeted survey weather condition data

Table 7 Striped Legless Lizard survey details Sky Road West

Check number	Date	Time	Air temp (°C)	Cloud cover (/8)	Wind direction	Average wind speed (km/hr)	Humidity (%)	Precipitation
1	29/09/2025	Start 11:08 am	20.4	0/8	N	7.5	39.9	Nil
		End 12:36 pm	22.1	0/8	N	6.5	37.3	Nil
2	07/10/2025	Start: 11:40 am	16.7	4/8	N	4.3	43.6	Nil
		End: 01:43 pm	19.2	2/8	NW	3.3	46.7	Nil
3	15/10/2025	Start 11:27 am	22.1	0/0	N	5.7	38.6	Nil
		End: 12:18 pm	25.7	0/0	N	2.5	26.8	Nil
4	21/10/2025	Start: 09:00 am	12.2		N	9	72	Nil
		End: 12:40 pm	22.9	5/8	N	2	31.7	Nil
5	30/10/2025	Start: 09:08 am	17.3	0/8	N	0	62.8	Nil
		End 10:54 pm	22.3	0/8	N	2.2	38.2	Nil
6	07/11/2025	Start: 08:30 am	17.9	8/8	NE	3.7	49.3	Light rain
		End 10:37 pm	22.7	8/8	N	2.8	34.1	Nil
7	13/11/2025	Start: 10:54 am	23.1	4/8	SE	6.1	23.7	Nil
		End 12:03 pm	22.1	4/8	NW	3	24	Nil
8	21/11/2025	Start: 11:34 am	18.9	4/8	N	4.2	38.1	Nil
		End 12:32 pm	17.6	5/8	N	8.9	36	Nil
9	01/12/2025	Start: 12:55 pm	11.2	5/8	SW	8	82.3	Light rain
		End 03:00 pm	14.1	5/8	W	35	67	Nil
10	10/12/2025	Start: 09:30 am	16.3	8/8	SW	2.6	6.5	Nil
		Start: 12:31 pm	21.4	7/8	W	4.5	61.5	Nil

Table 8 Golden Sun Moth survey details

Check number	Date	Time	Air temp (°C)	Cloud cover (/8)	Wind direction	Average wind speed (km/hr)	Humidity (%)	Rain	Species recorded on site?
1	25/11/2025	Start 12:10 am	23.8	3/8	SW	10.4	51.8	Nil	Nil
		End 01:13 pm	25.6	2/8	WSW	5.2	51.2	Nil	
2	05/12/2025	Start: 01:43 pm	21.3	4/8	SSE	7	23	Nil	Nil
		End: 02:45 pm	22.3	3/8	S	4.5	23/7	Nil	
3	12/12/2025	Start 12:20 am	29.7	2/8	N	12.8	42.9	Nil	Nil
		End: 01:00 pm	30.9	5/8	N	9.6	38	Nil	
4	29/12/2025	Start: 09:20 am	24	2/8	NNE	4.3	43.1	Nil	Nil
		End: 10:15 am	31.2	2/8	NNE	5.3	26	Nil	

Table 9 Growling Grass Frog survey data

Site	Date	Time Start	Time Finish	Temperature (°C)	Wind Direction	Average wind speed (km/h)	Humidity (%)
Location 1	17/12/2025	10:30PM	10:50PM	19.1	WNW	5	41
	18/12/2025	11:17PM	11:37PM	25.1	WNW	1	44
Location 2	17/12/2025	10:50PM	11:35PM	18.2	WNW	5	40
	18/12/2025	09:52PM	10:29PM	26.8	S	3.9	38
Location 3	17/12/2025	10:58PM	11:34PM	18.2	WNW	5	40
	18/12/2025	10:35PM	10:50PM	23.9	WSE	4.6	46

Appendix 2 Photos



Photo 1 **NTGVVP dominated by Wallaby Grasses *Rytidosperma* spp. (Habitat Zone 4). Photo taken 10 December 2025.**



Photo 2 **Wallaby Grass as the dominant native species within a patch of NTGVVP. Photo taken 10 December 2025.**



Photo 3 Predominantly introduced vegetation consisting of Chilean Needle-grass.


biosis
APEM Group

Appendix H: Melbourne Airport PFAS Investigation Results (Cardno 2018)

Melbourne Airport PFAS Investigation Results

Melbourne Airport, VIC

V161668Report08.2
Melbourne Airport PFAS
Investigation Results



Prepared for
Australia Pacific Airports
(Melbourne) Pty Ltd

December 2018

Cardno
Shaping the Future

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Melbourne Airport PFAS Investigation Results

Melbourne Airport, VIC

Table of Contents

1 Introduction 1
1.1 Background 1
1.2 Purpose & Objectives 1
1.3 Standard of Assessment and Limitations 1
1.4 Scope of Assessment 2
1.4.1 Intrusive Sampling & Testing 2
1.5 Assessment Timeline 3
2 Hydrology and Hydrogeology 4
2.1 Geology and Aquifers 4
2.2 Groundwater Occurrence and Flow 4
3 Site Investigation 5
3.1 Soil and Sediment Assessment Program 5
3.1.1 Laboratory Analysis – Soil and Sediment 5
3.2 Groundwater and Surface Water Assessment Program 6
3.2.1 Surface Water Sampling 6
3.2.2 Groundwater Monitoring Well Installation 6
3.2.3 Groundwater Sampling 7
3.2.4 Groundwater and Surface Water – Laboratory Analysis 7
4 References 9

Text Tables

Table 1-1: Site Assessment Timeline 3
Table 3-1: Soil and Sediment Assessment Activity Summary 5
Table 3-2: Analytical Screen Definitions – Soil and Sediment Samples 5
Table 3-3: Surface Water Sampling Summary 6
Table 3-4: Surface Water Sampling Locations 6
Table 3-5: Groundwater Monitoring Well Installation Summary 7
Table 3-6: Groundwater Monitoring Events Summary 7
Table 3-7: Analytical Screen Definitions – Groundwater and Surface Water 8

Appendices

Appendix A..... 21 Pages
Figures
Figure 1: Site Layout and Sampling Locations
Figure 2: Site Layout and Sampling Locations (Inset A1)
Figure 3: Site Layout and Sampling Locations (Inset A2)
Figure 4: Site Layout and Sampling Locations (Inset B1)
Figure 5: Site Layout and Sampling Locations (Inset B2)
Figure 6: Site Layout and Sampling Locations (Inset B3)
Figure 7: Site Layout and Sampling Locations (Inset B4)
Figure 8: Site Layout and Sampling Locations (Inset C1)
Figure 9: Site Layout and Sampling Locations (Inset C2)
Figure 10: Site Layout and Sampling Locations (Inset C3)
Figure 11: Site Layout and Sampling Locations (Inset C4)
Figure 12: Site Layout and Sampling Locations (Inset C5)
Figure 13: Site Layout and Sampling Locations (Inset D1)
Figure 14: Site Layout and Sampling Locations (Inset D2)
Figure 15: Site Layout and Sampling Locations (Inset D3)
Figure 16: Site Layout and Sampling Locations (Inset D4)
Figure 17: Site Layout and Sampling Locations (Inset D5)
Figure 18: Site Layout and Sampling Locations (Inset E1)
Figure 19: Site Layout and Sampling Locations (Inset E2)
Figure 20: Site Layout and Sampling Locations (Inset E3)

Appendix B..... 171 Pages
Tables of Results
Table B1: Groundwater Gauging Results
Table B2: Groundwater Stabilised Parameters
Table B3: Groundwater Analytical Results
Table B4: Soil Analytical Results - Perfluorocarbons
Table B5: Soil Analytical Results – Pesticides, Herbicides, Phenols
Table B6: Soil Analytical Results – BTEX, TPH, PAH, Metals, Inorganics
Table B6: Soil Analytical Results
Table B7: Soil Leachability Results
Table B8: Sediment Analytical Results
Table B9: Surface Water Analytical Results
Table B10: Surface Water and Groundwater RPD Results
Table B11: Soil and Sediment RPD Results
Table B12: QAQC Results

Appendix C..... 733 Pages
Soil and Groundwater Bore Logs

Appendix D..... 4 Pages
Surveyors Report

Appendix E..... 3 Pages
Information about Environmental Reports

List of Abbreviations and Units

Chemical Names

BaP	Benzo(a)pyrene
BTEX	Benzene, Toluene, Ethylbenzene & Xylenes (subset of MAH)
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene
F1	Fraction 1 C_6-C_{10}
F2	Fraction 2 >C_{10} – C_{16}
F3	Fraction 3 >C_{16} – C_{34}
F4	Fraction 4 >C_{34} – C_{40}
MAH	Monocyclic Aromatic Hydrocarbons
OCP	OrganoChlorine Pesticides
OPP	OrganoPhosphate Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	PolyChlorinated Biphenyls
PHC	Petroleum Hydrocarbons
SVOC	Semi-Volatile Organic Compounds
TDS	Total Dissolved Solids (salinity of water)
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons (= TPH)
VOC	Volatile Organic Compounds
VHC	Volatile Halogenated Compounds

Technical Terms

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
AST	Aboveground Storage Tank
BGA	Brighton Group Aquifer
COPC	Chemicals of Potential Concern
CSM	Conceptual Site Model
CUN	Clean Up Notice
DO	Dissolved Oxygen
DSI	Detailed Site Investigation
EC	Electrical Conductivity
EAA	Environmental Assessment Area
EIL	Ecological Investigation Levels
EPA	Environment Protection Authority
ESL	Ecological Screening Level

GIL	Groundwater Investigation Level
GME	Groundwater Monitoring Event
HIL	Health Investigation Level
HSL	Health Screening Level
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit of Reporting
mbgs	Metres Below Ground Surface
MSDS	Material Safety Data Sheet
N/A	Not Applicable
NAPL	Non-Aqueous Phase Liquid
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
NVA	Newer Volcanic Aquifer
PAN	Pollution Abatement Notice
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
SEPP	State Environment Protection Policy
SoEA	Statement of Environmental Audit
TIT	Triple Interceptor Trap
UCL	Upper confidence Limit
UST	Underground Storage Tank

Units

Ha	Hectares
mbgl	Metres Below Ground Level
mbgs	Metres Below Ground Surface
mbtoc	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
ppb	Part per Billion
µg/kg	Microgram per Kilogram (approximately equivalent to ppb)
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity - Water)

Site Specific

ASA	Air Services Australia
APAM	Australia Pacific Airports Melbourne Pty Ltd.
ARFF	Aircraft Rescue and Fire Fighting

FAC	Federal Aviation Commission
MAFS	Melbourne Airport Fire Station
OFTG	Old Fire Training Ground
SFS	Satellite Fire Station

Melbourne Airport PFAS Investigation Results

Melbourne Airport, VIC

1 Introduction

1.1 Background

Cardno Victoria Pty Ltd ("Cardno") was engaged by Australia Pacific Airports (Melbourne) Pty Ltd ("the Client"), to conduct a site-wide PFAS Assessment at Melbourne Airport, VIC ("the site"). The location and features of the site are shown on Figure 1, presented in Appendix A.

This report presents the results of soil, sediment, groundwater and surface water samples obtained from the site over the course of the investigation in 2017.

1.2 Purpose & Objectives

The purpose of this report is to provide a succinct summary of the work undertaken, the location of, and results for, samples obtained from the various media.

1.3 Standard of Assessment and Limitations

The investigation was undertaken in general accordance with the current[1] "*industry standards*" for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

- Commonwealth Airports Act No. 42 (1996).
- The Airports (Environment Protection) Regulations 1997.
- CRC CARE (2017), Technical Report No. 38, *Assessment, management and remediation for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) – Part 5: management and remediation of PFOS and PFOA,* January 2017.
- EPA Victoria (2000) *Groundwater Sampling Guidelines*, Publication 669, April 2000.
- GHD (2015) for Airservices Australia, *Managing PFC Contamination at Airports – Interim Contamination Management Strategy and Decision Framework*, June 2015.
- National Environment Protection Council (NEPC) (1999) *National Environment Protection (Assessment of Site Contamination) Measure*, as amended (registered on 15 May 2013). This is referred to from here on as "the NEPM" or "NEPM (2013)".
- Standards Australia (2005) *AS4482.1: Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds*.
- Standards Australia (2005) *AS 4482.2: Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances.*
- AS/NZS 5667.1 (1998) *Water quality -Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.* Australian/New Zealand Standard – AS/NZS 5667.1:1998.
- AS/NZS 5667/4 (1998) *Water quality – Sampling, Part 4: Guidance on sampling from lakes, natural and man-made.* Australian/New Zealand Standard – AS/NZS 5667.4:1998.
- AS/NZS 5667.6 (1998) *Water quality – Sampling, Part 6: Guidance on sampling of rivers and streams.* Australian/New Zealand Standard – AS/NZS 5667/6:1998.

[1] Current at the date of commencements of this investigation in February 2017.

- AS/NZS 5667.11 (1998) *Water quality – Sampling, Part 11: Guidance on sampling of groundwater.* Australian/New Zealand Standard – AS/NZS 5667.11:1998.
- AS/NZS 5667.12 (1998) *Water quality - Sampling, Part 12: Guidance on sampling of bottom sediments.* Australian/New Zealand Standard – AS/NZS 5667.12:1998.
- Australian & New Zealand Environment & Conservation Council and Agriculture & Resource Management Council of Australia and New Zealand (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
- Australian & New Zealand Environment & Conservation Council and Agriculture & Resource Management Council of Australia and New Zealand (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality,* National Water Quality Management Strategy.
- National Health and Medical Research Council (2008) *Guidelines for Managing Risks in Recreational Water.*
- National Health and Medical Research Council & Natural Resource Management Ministerial Council (2011) *Australian Drinking Water Guidelines 6 Version 3.3,* National Water Quality Management Strategy, November 2016.

The agreed scope of this investigation has been limited for the current purposes of the Client. The assessment may not identify contamination occurring in all areas of the site, or occurring after sampling was conducted. Subsurface conditions may vary considerably away from the sample locations where information has been obtained.

This site assessment report is not any of the following:

- An Environmental Audit Report as defined under the Environment Protection Act 1970.
- A geotechnical report, and the bore logs or test pit logs may not be sufficient as the basis for geotechnical advice.
- A detailed hydrogeological assessment in conformance with EPA Victoria Publication 668 Hydrogeological Assessment (Groundwater Quality) Guidelines (EPA 2006).
- A total assessment of the site to determine suitability of the entire parcel of land at the site for one or more of the beneficial uses of land set out in State Environmental Protection Policy (Prevention and Management of Contamination of Land) and its variation.

An overview of site environmental assessments is included in Appendix E.

1.4 Scope of Assessment

1.4.1 Intrusive Sampling & Testing

The following work was undertaken:

- Implemented a comprehensive Sampling and Analysis Quality Plan (SAQP) including laboratory analysis of field quality control (QC) samples;
- Performed an intrusive assessment of near surface soil across the site;
- Obtained sediment samples from drains and culverts;
- Obtained surface water samples;
- Drilled and installed 23 groundwater monitoring wells;
- Gauged the water levels in each groundwater monitoring well;
- Conducted one groundwater monitoring event (GME) at the site; and
- Engaged a licenced surveyor to record locations and elevations of the groundwater monitoring wells.

> Tested selected soil, sediment, surface water and groundwater samples for contaminants of potential concern (CoPC), predominantly PFAS. All chemical analysis was conducted by a National Association of Testing Authorities (NATA)-accredited laboratory.

1.5 Assessment Timeline

The key dates relevant to this assessment are summarised in Table 1-1.

Table 1-1: Site Assessment Timeline

Date	Activity/Milestone
5 June 2017	Groundwater drilling and soil / surface water investigation fieldwork commences.
4 August 2017	Soil and surface water investigation fieldwork complete.
5 September 2017	Groundwater drilling fieldwork complete.
19 September 2017	Groundwater monitoring event (GME) commenced.
5 October 2017	Groundwater monitoring event (GME) complete.
10 October 2017	Survey of groundwater monitoring wells complete.

2 Hydrology and Hydrogeology

2.1 Geology and Aquifers

The geology and hydrogeology of the Site and its regional setting is obtained from the following published sources:

- The Geological Survey of Victoria, Sunbury, 1:63,360 Map sheet; and
- Geology of Victoria (Birch, 2013).

Most of the airport site is underlain by basalt and residual basaltic clays or other soils formed due to weathering. Devonian Granodiorite (*Bulla Granodiorite*) occurs on the north part of the site and the remainder of the site Quaternary Newer Volcanic Basalts, underlain by Tertiary sediments (*Brighton Group*), Older Volcanics basalt (Tvn), Tertiary sediments of the Werribee Formation, and bedrock comprising siltstone and minor sandstone. Hornfels occurs in the metamorphic aureole adjacent the Bulla Granodiorite. Recent colluvium occurs on the slopes of the incised valleys associated with Deep Creek, Maribyrnong River and Arundel Creek.

The main geological units that may comprise or contain aquifers at the site are:

- Newer Volcanics: Quaternary to Tertiary aged fractured basalt water table aquifer with highly variable permeability;
- Brighton Group: Tertiary aged porous media aquifer predominantly of silty and clayey sand of low permeability. Contains the water table when the NVA is unsaturated;
- Older Volcanics: Tertiary aged variably weathered basalt ranging from clay to moderately weathered fractured basalt;
- Werribee Formation: Tertiary aged porous media aquifer comprising fine to coarse sand, silty clay and ligneous clay, may be interbedded with and underlie Older Volcanics
- Silurian Bedrock Aquifer (SBA): also known as the Melbourne Formation Aquifer, occurs as a fractured siltstone and sandstone water table aquifer in outcrop, otherwise is confined under the Tertiary geological units.

2.2 Groundwater Occurrence and Flow

The observations gathered on groundwater occurrence and flow during the investigations show that the groundwater occurs at between 79 and 106 m AHD in the north-eastern (up-gradient) section of the site and at 52 to 53 mAHD near the water course adjoining the western boundary of the site. Groundwater flow is generally to the south west direction with inferred discharge to incised drainage lines such as Deep Creek and the Maribyrnong River to the west, and to Moonee Ponds Creek to the east.

3 Site Investigation

3.1 Soil and Sediment Assessment Program

The soil and sediment sampling fieldwork was conducted between 5 June 2017 and 4 October 2017. The scope and method of the work is summarised in Table 3-1.

Figures showing the ampling locations are provided in Appendix A.

Table 3-1: Soil and Sediment Assessment Activity Summary

Activity	Details
Dates of Field Activity	5 June 2017 to 4 October 2017
Drilling	All locations were extended by hand auger, push tube or non-destructive drill (NDD) rig.
Soil Logging	Soil encountered during drilling and hand auguring was described and logged. Bore logs are presented in Appendix C.
Soil and Sediment Sampling	Sediment samples were collected at surface (nominated as 0.1 mBGL). Soil samples were stored in HDPE containers provided by the laboratory.
Sample Preservation and Transport	Samples were doubled bagged with zip lock bags (in accordance with DER, 2017) and stored on ice, in an esky while on-site and in transit to the laboratory under Chain of Custody (COC) documentation.
Borehole Abandonment	Bores were abandoned and backfilled with soil cuttings produced during drilling.

3.1.1 Laboratory Analysis – Soil and Sediment

All near-surface samples were selected for laboratory testing. The selected samples were tested for a broad range of parameters, summarised in Table 3-2, below.

The primary laboratory was Envirolab and the secondary laboratory ALS. Both laboratories are NATA-accredited for the parameters tested. Tabulated laboratory results are presented in Appendix B.

Table 3-2: Analytical Screen Definitions – Soil and Sediment Samples

Analytical Screen Definitions
PFAS Short Suite: (low detection) – perfluorohexanesulfonic acid (PFHxS), perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), 6:2 FtS, 8:2 FtS.
PFAS Extended Suite: (low detection) – perfluorobutanesulfonic acid, perfluoropentanesulfonic acid, perfluorohexanesulfonic acid, perfluoroheptanesulfonic acid, perfluorooctanesulfonic acid, perfluorodecanesulfonic acid, perflurobutanoic acid, perfluoropentanoic acid, perfluorohexanoic acid, perfluoroheptanoic acid, perfluorooctanoic acid, perfluorononanoic acid, perfluorodecanoic acid, perfluoroundecanoic acid, perfluorododecanoic acid, perfluorotridecanoic acid, perfluorotetradecanoic acid, 4:2 FtS, 6:2 FtS, 8:2 FtS, 10:2 FtS, perfluorooctane sulfonamide, N-Methyl perfluorooctane sulfonamide, N-Ethyl perfluorooctanesulfonamide, N-Me perfluorooctanesulfonamid-oethanol, N-Et perfluorooctanesulfonamid-oethanol, Me Perfluorooctanesulf-amid oacetic acid, Et Perfluorooctanesulf-amid oacetic acid.
PFAS ASLP: Australian Standard Leachability Procedure Extended Suite (low detection) – perfluorobutanesulfonic acid, perfluoropentanesulfonic acid, perfluorohexanesulfonic acid, perfluoroheptanesulfonic acid, perfluorooctanesulfonic acid, perfluorodecanesulfonic acid, perflurobutanoic acid, perfluoropentanoic acid, perfluorohexanoic acid, perfluoroheptanoic acid, perfluorooctanoic acid, perfluorononanoic acid, perfluorodecanoic acid, perfluoroundecanoic acid, perfluorododecanoic acid, perfluorotridecanoic acid, perfluorotetradecanoic acid, 4:2 FtS, 6:2 FtS, 8:2 FtS, 10:2 FtS, perfluorooctane sulfonamide, N-Methyl perfluorooctane sulfonamide, N-Ethyl perfluorooctanesulfonamide, N-Me

Analytical Screen Definitions
perfluorooctanesulfonamid-oethanol, N-Et perfluorooctanesulfonamid-oethanol, Perfluorooctanesulf-amid oacetic acid, Et Perfluorooctanesulf-amid oacetic acid.
TRH / BTEXN: Total Recoverable Hydrocarbons / Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene.
Metals: Arsenic, Barium, Beryllium, Cadmium, Chromium (III+VI), Cobalt, Copper, Lead, Nickel, Manganese, Vanadium, Mercury, Iron, Selenium and Zinc.
CEC / TOC: Cation Exchange Capacity / Total Organic Carbon.
OCP / OPP / Herb: Organochlorine Pesticides / Organophosphate Pesticides / Herbicides.

3.2 Groundwater and Surface Water Assessment Program

The groundwater and surface water sampling fieldwork was conducted between 26 June 2017 and 5 October 2017.

3.2.1 Surface Water Sampling

Details of the surface water sampling activities are provided in Table 3-3 and the sampling locations are listed in Table 3-4.

Table 3-3: Surface Water Sampling Summary

Activity	Details
Dates of Field Activity	26 June 2017
Sampling Procedure	Samples were collected using the direct sample collection method, where the lip of the sampling containers were lowered below the surface water level (e.g. minimum 0.1 m below surface) facing upstream of sampler position. Where possible, the cap of the sampling container was unscrewed under water to collect the respective samples. Surface water samples were directly placed into laboratory provided sampling containers (pre-preserved where appropriate) and without headspace. All samples were labelled with a ballpoint pen on water resistant labels attached to the sample bottles.
Sample preservation and transport	Samples were doubled bagged with zip lock bags (in accordance with DER, 2017) and stored on ice, in an esky while onsite and in transit to the laboratory under Chain of Custody documentation.

Table 3-4: Surface Water Sampling Locations

Location	Location Name	Rationale
	Locations	
Dam	SW001	Assess for impacts resulting from the use of AFFF in firefighting training activities and residual PFAS present in the evaporation dam.

3.2.2 Groundwater Monitoring Well Installation

Details of groundwater monitoring well installation activities are provided in. Bore logs are provided in Appendix C and well construction details are summarised in Table B1, Appendix B.

Table 3-5: Groundwater Monitoring Well Installation Summary

Activity	Details
Dates of Field Activity	5 June 2017 – 5 September 2017
Licenced Drilling Contractors	Matrix Drilling South Western Drilling (GW002, GW003 and GW015B only)
Drilling	All locations were extended by hand auger or non-destructive drilling (NDD) rig to maximum of 0.5 mBGL, prior to drilling with the Solid Flight Auger and/or Air Hammer and/or Sonic drilling techniques.
Well construction	Bore logs are provided in Appendix C and the bore construction details are summarised in Table B1, Appendix B.
Surveying	Wells were surveyed to GDA94 MGA Zone 55 by a licensed surveyor. The surveyor's report is included in Appendix D.
Well development	All new groundwater monitoring bores were developed to remove fines from the formation and bore introduced or disturbed by drilling. Development used air lift techniques applied at least 24 hours after installation.

3.2.3 Groundwater Sampling

A Groundwater Monitoring Event (GME) was carried out using methods in accordance with the EPA Publication 669 *Groundwater Sampling Guidelines* (EPA VIC, April 2000) and Cardno field procedures. GME activities are summarised in Table 3-6.

Table 3-6: Groundwater Monitoring Events Summary

Activity	Details
Dates of field activity	18 September to 5 October 2017
Well gauging	Monitoring wells were gauged using an oil/water interface probe. The oil/water interface probe was decontaminated between each measurement with PFAS-free detergent (Liquinox®) and tripled rinsed with deionised water. Gauging was completed prior to purging and sampling. All wells were measured against a specified mark at the top of the PVC well casing.
Well purging and sampling procedures	All wells were sampled using the "low flow" technique with a MicroPurge® sampling kit, with the exception of: ▪ GW007 – sampled with bailer due to slow recovery. ▪ GW012 – sampled with bailer due to slow recovery. ▪ GW021 – sampled with bailer due to slow recovery. ▪ GW025 – sampled with bailer due to slow recovery.
Well purging	Field parameters: Dissolved Oxygen (DO), EC, pH, oxidation-reduction potential (ORP), and temperature) were recorded between each purge volume. Purging continued until parameters were stabilised. Standing water levels (SWLs) were recorded during purging to monitor draw down of the water table, with pumping rates set to prevent excessive draw down. Groundwater stabilised parameters are presented in Table B2 and B3, Appendix B.
Decontamination procedure	All non-disposable field equipment was cleaned using Liquinox® and triple rinsed with deionised water between each well.
Sample preservation and transport	Samples were stored on ice, in an esky while onsite and in transit to the laboratory under Chain of Custody documentation.

3.2.4 Groundwater and Surface Water – Laboratory Analysis

Groundwater and surface water samples were analysed for the range of analytes presented in

Table 3-7.

The primary laboratory was Envirolab and the secondary laboratory ALS. Both laboratories are NATA-accredited for the parameters tested. Tabulated laboratory results are presented in Appendix B.

Table 3-7: Analytical Screen Definitions – Groundwater and Surface Water

Analytical Screen Definitions
PFAS Extended Suite: (low detection) – perfluorobutanesulfonic acid, perfluoropentanesulfonic acid, perfluorohexanesulfonic acid, perfluoroheptanesulfonic acid, perfluorooctanesulfonic acid, perfluorodecanesulfonic acid, perflurobutanoic acid, perfluoropentanoic acid, perfluorohexanoic acid, perfluoroheptanoic acid, perfluorooctanoic acid, perfluorononanoic acid, perfluorodecanoic acid, perfluoroundecanoic acid, perfluorododecanoic acid, perfluorotridecanoic acid, perfluorotetradecanoic acid, 4:2 FtS, 6:2 FtS, 8:2 FtS, 10:2 FtS, perfluorooctane sulfonamide, N-Methyl perfluorooctane sulfonamide, N-Ethyl perfluorooctanesulfonamide, N-Me perfluorooctanesulfonamid-oethanol, N-Et perfluorooctanesulfonamid-oethanol, MePerfluorooctanesulf-amid oacetic acid, Et Perfluorooctanesulf-amid oacetic acid.
vTRH (C_6-C_{10}) / BTEXN: Volatile Total Recoverable Hydrocarbons / Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene.
svTRH (C10-C40): Semi-volatile Total Recoverable Hydrocarbons.
CHC: Chlorinated Hydrocarbons
Metals: Arsenic, Barium, Beryllium, Cadmium, Chromium (III + VI), Cobalt, Copper, Iron, Lead, Nickel, Manganese, Vanadium, Zinc, Silver.
Major Ions:
TDS / EC: Total Dissolved Solids and Electrical Conductivity.

4 References

Legislation and Guidelines

1. *Environment Protection Act*, 1970 (Act No.8056/1970), Victoria.
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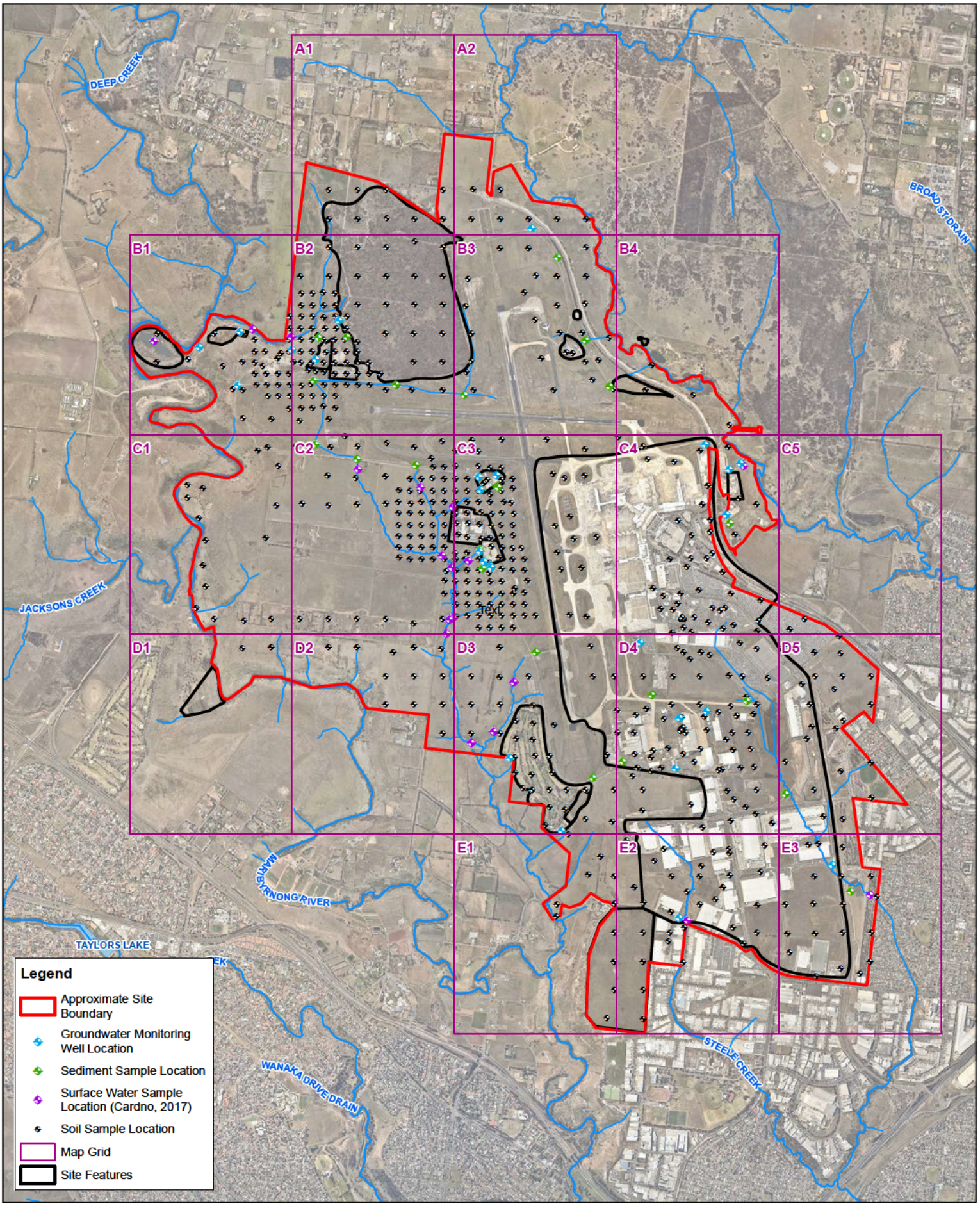
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Appendix A

21 Pages

Figures

Figure 1: Site Layout and Sampling Locations
Figure 2: Site Layout and Sampling Locations (Inset A1)
Figure 3: Site Layout and Sampling Locations (Inset A2)
Figure 4: Site Layout and Sampling Locations (Inset B1)
Figure 5: Site Layout and Sampling Locations (Inset B2)
Figure 6: Site Layout and Sampling Locations (Inset B3)
Figure 7: Site Layout and Sampling Locations (Inset B4)
Figure 8: Site Layout and Sampling Locations (Inset C1)
Figure 9: Site Layout and Sampling Locations (Inset C2)
Figure 10: Site Layout and Sampling Locations (Inset C3)
Figure 11: Site Layout and Sampling Locations (Inset C4)
Figure 12: Site Layout and Sampling Locations (Inset C5)
Figure 13: Site Layout and Sampling Locations (Inset D1)
Figure 14: Site Layout and Sampling Locations (Inset D2)
Figure 15: Site Layout and Sampling Locations (Inset D3)
Figure 16: Site Layout and Sampling Locations (Inset D4)
Figure 17: Site Layout and Sampling Locations (Inset D5)
Figure 18: Site Layout and Sampling Locations (Inset E1)
Figure 19: Site Layout and Sampling Locations (Inset E2)
Figure 20: Site Layout and Sampling Locations (Inset E3)



Site Layout and Sampling Locations

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Legend

- Groundwater Monitoring Well Location
- Sediment Sample Location
- Surface Water Sample Location (Cardno, 2017)
- Soil Sample Location
- Approximate Site Boundary
- Site Features

Site Layout and Sampling Locations

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Legend

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- Sediment Sample Location
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- Site Features

Site Layout and Sampling Locations

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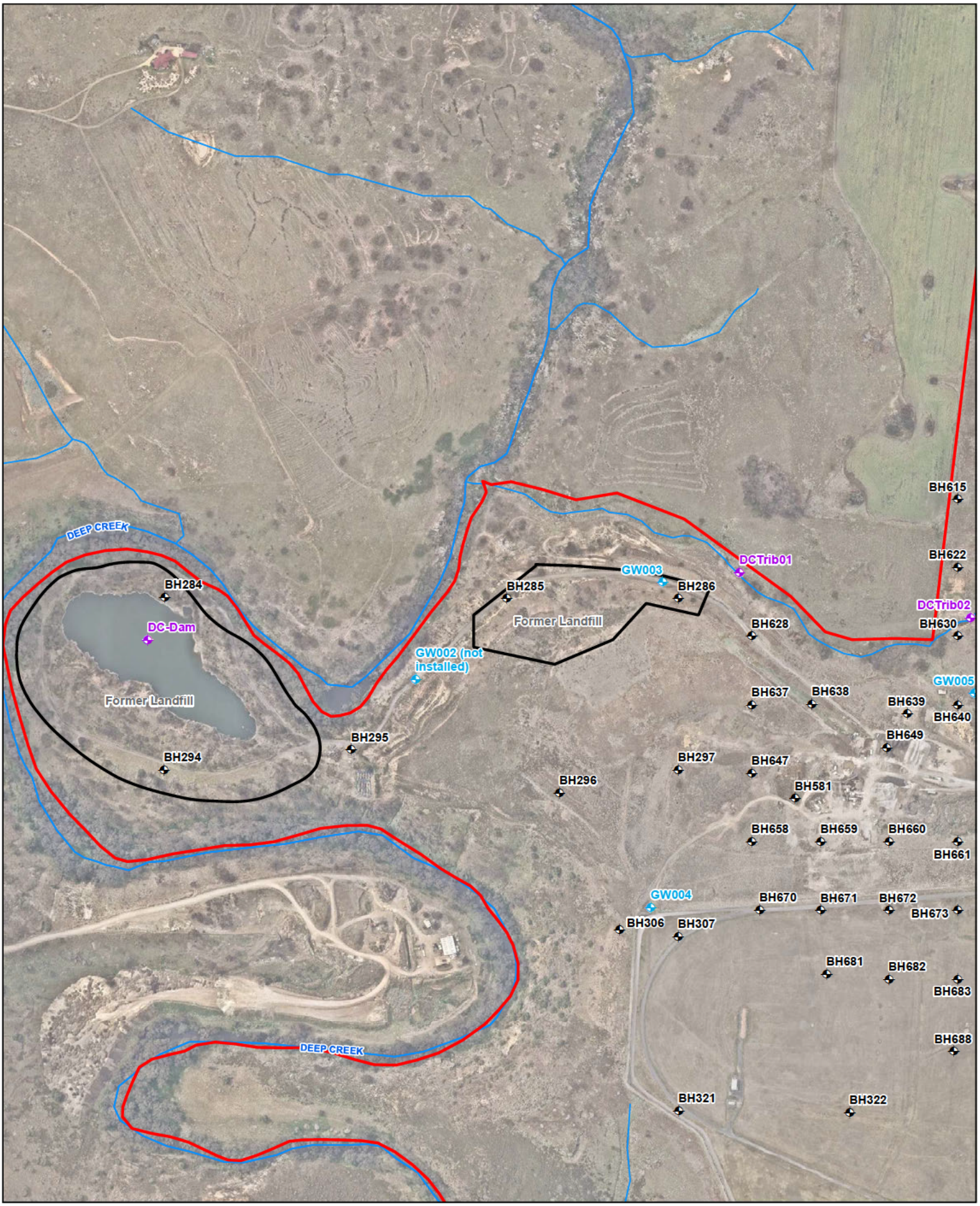
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Legend

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Site Layout and Sampling Locations

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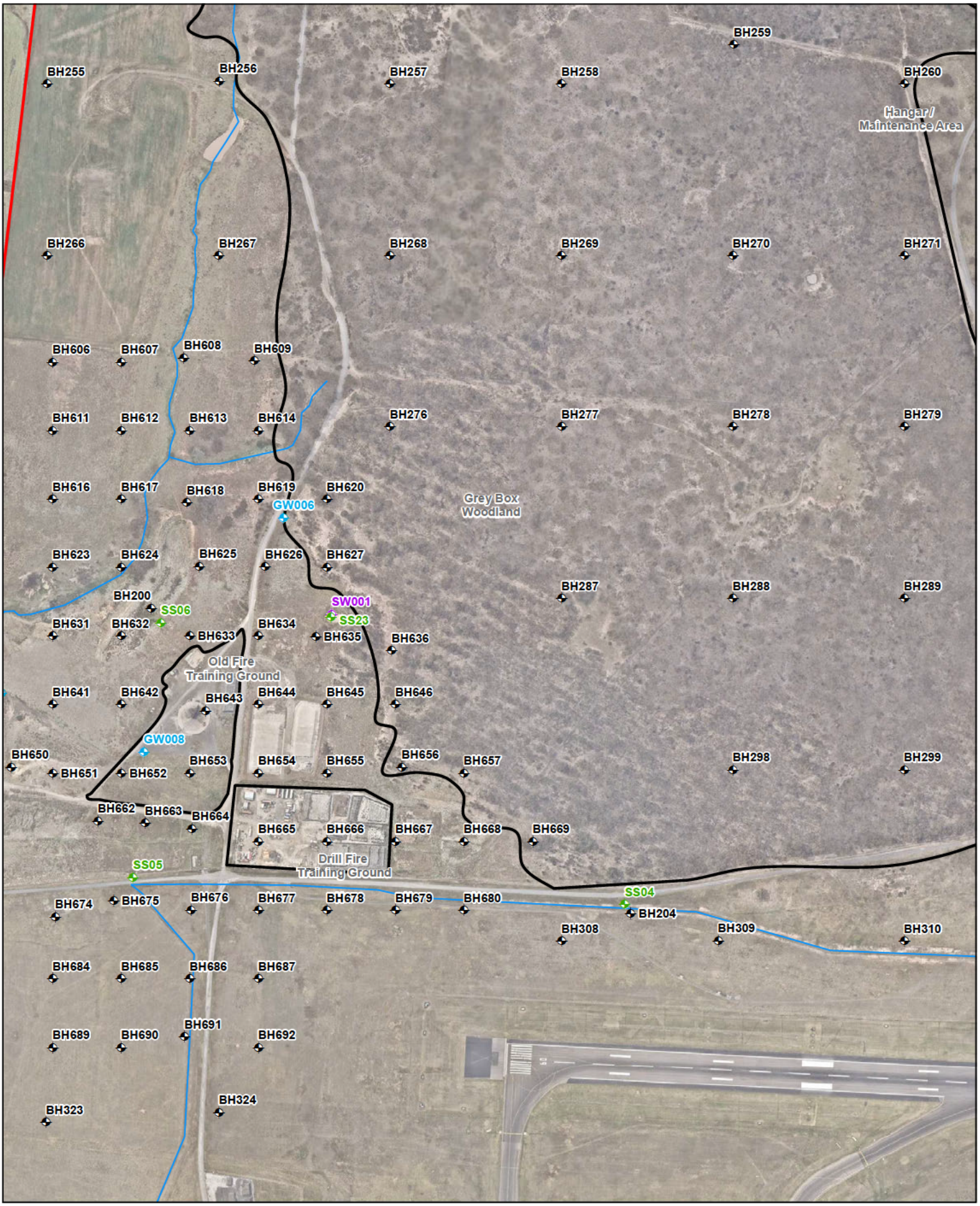
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Legend

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- Site Features

Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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Legend

- Groundwater Monitoring Well Location
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Site Layout and Sampling Locations

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Legend

- Groundwater Monitoring Well Location
- Sediment Sample Location
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- Site Features

Site Layout and Sampling Locations

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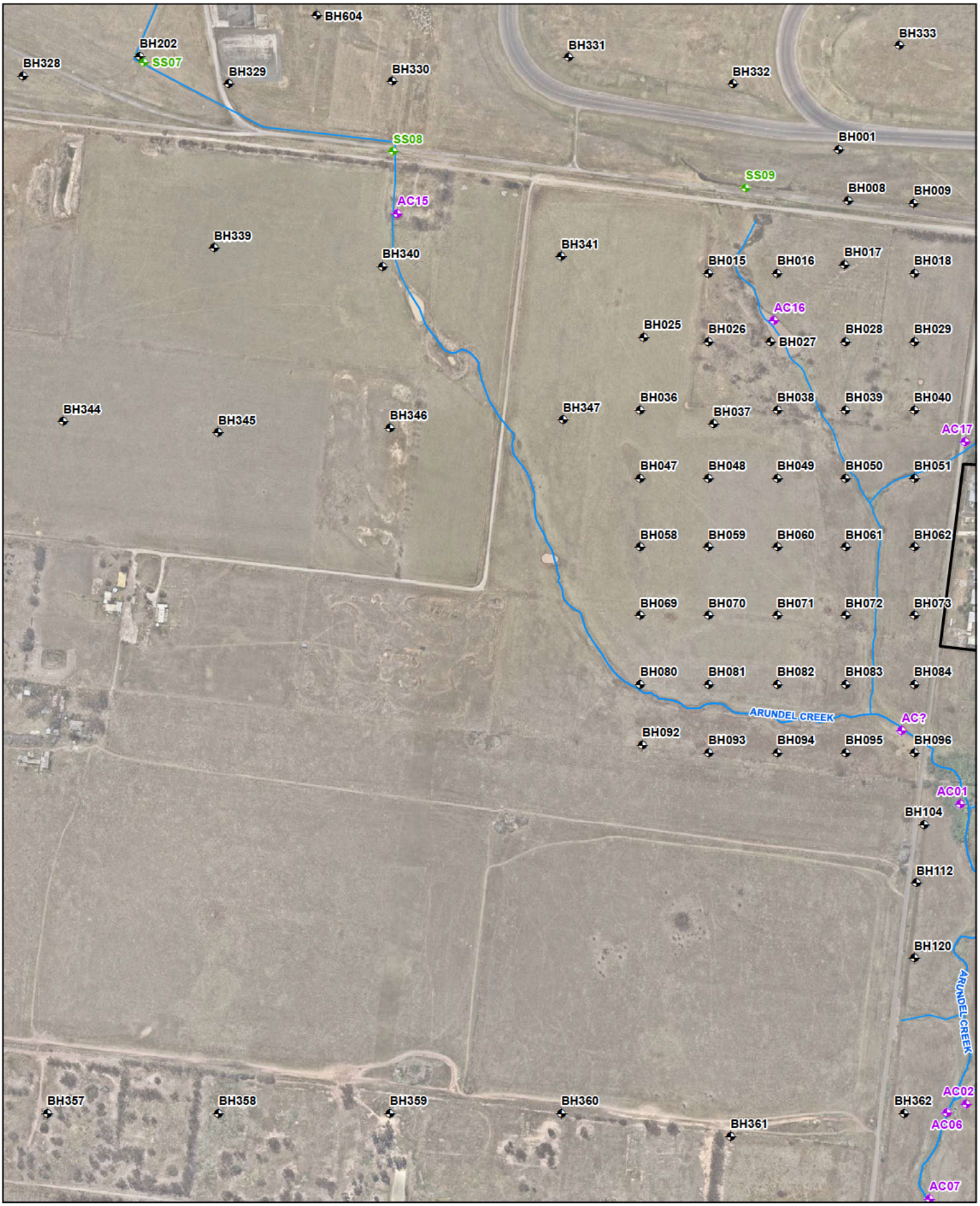
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Legend

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- Site Features

Site Layout and Sampling Locations

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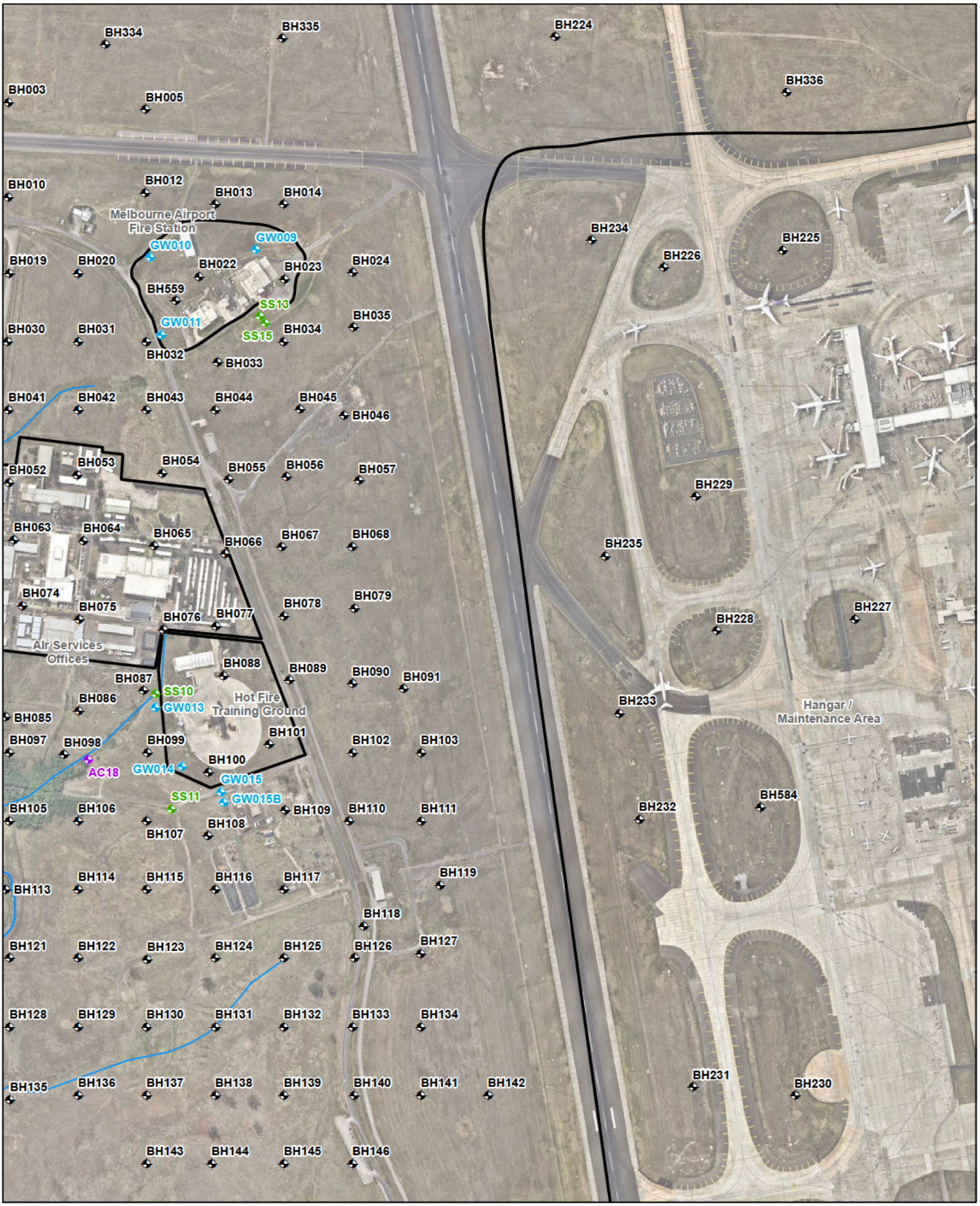
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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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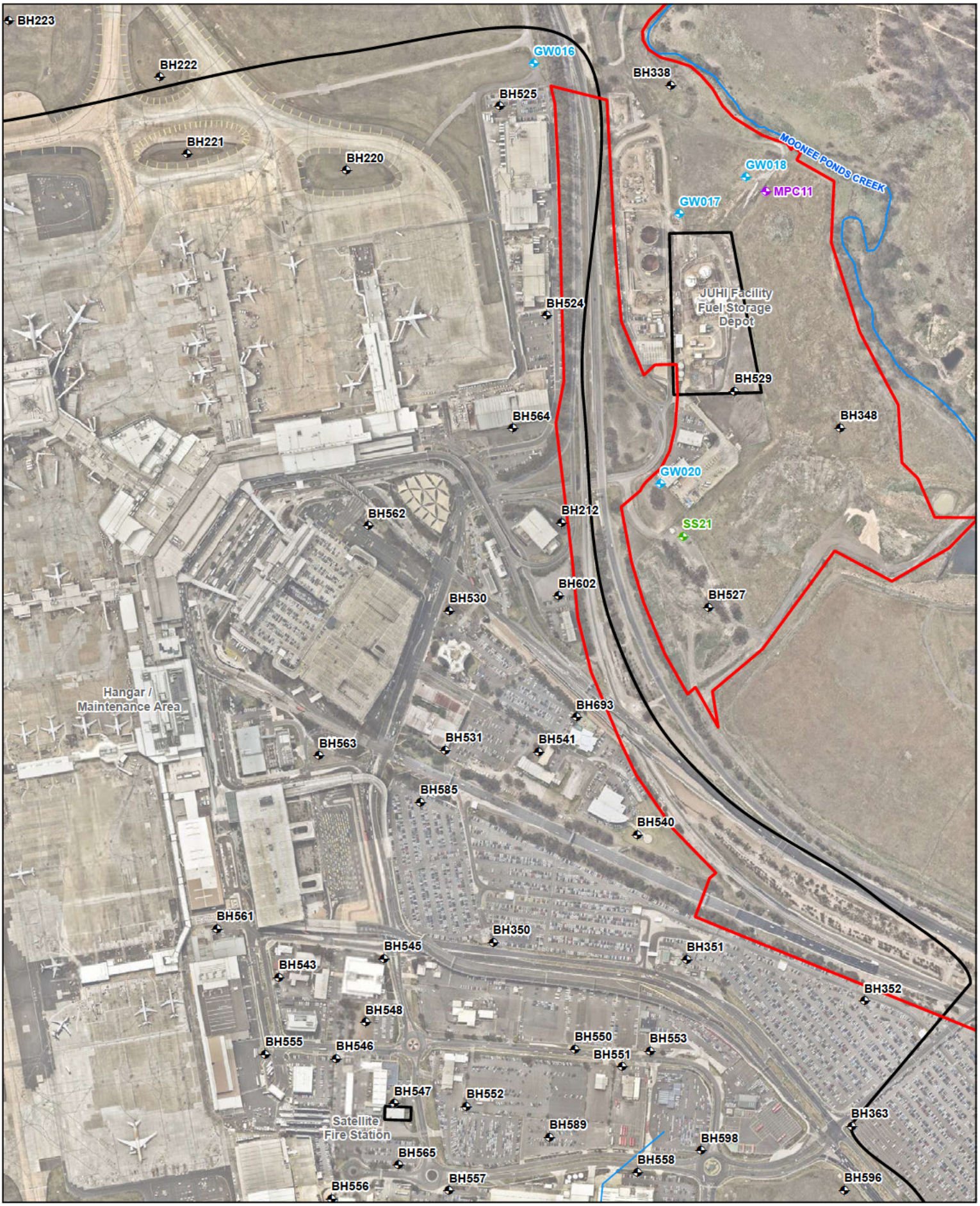
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Site Layout and Sampling Locations

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Legend

- Groundwater Monitoring Well Location
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Site Layout and Sampling Locations

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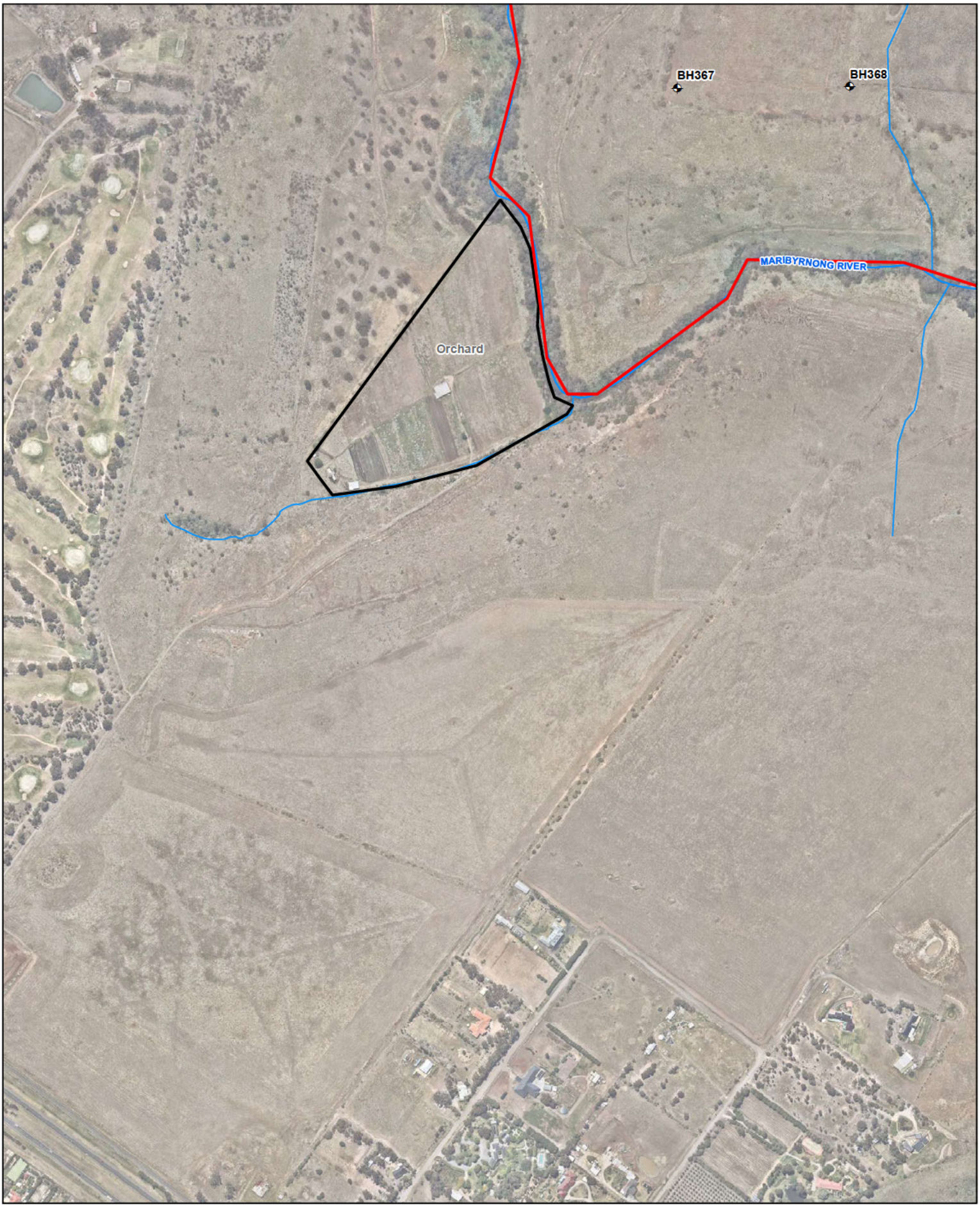
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Legend

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- Site Features

Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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Legend

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Site Layout and Sampling Locations

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Legend

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Site Layout and Sampling Locations

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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
AUSTRALIA PACIFIC AIRPORT (MELBOURNE) PTY LTD
Figure 16 - Inset D4

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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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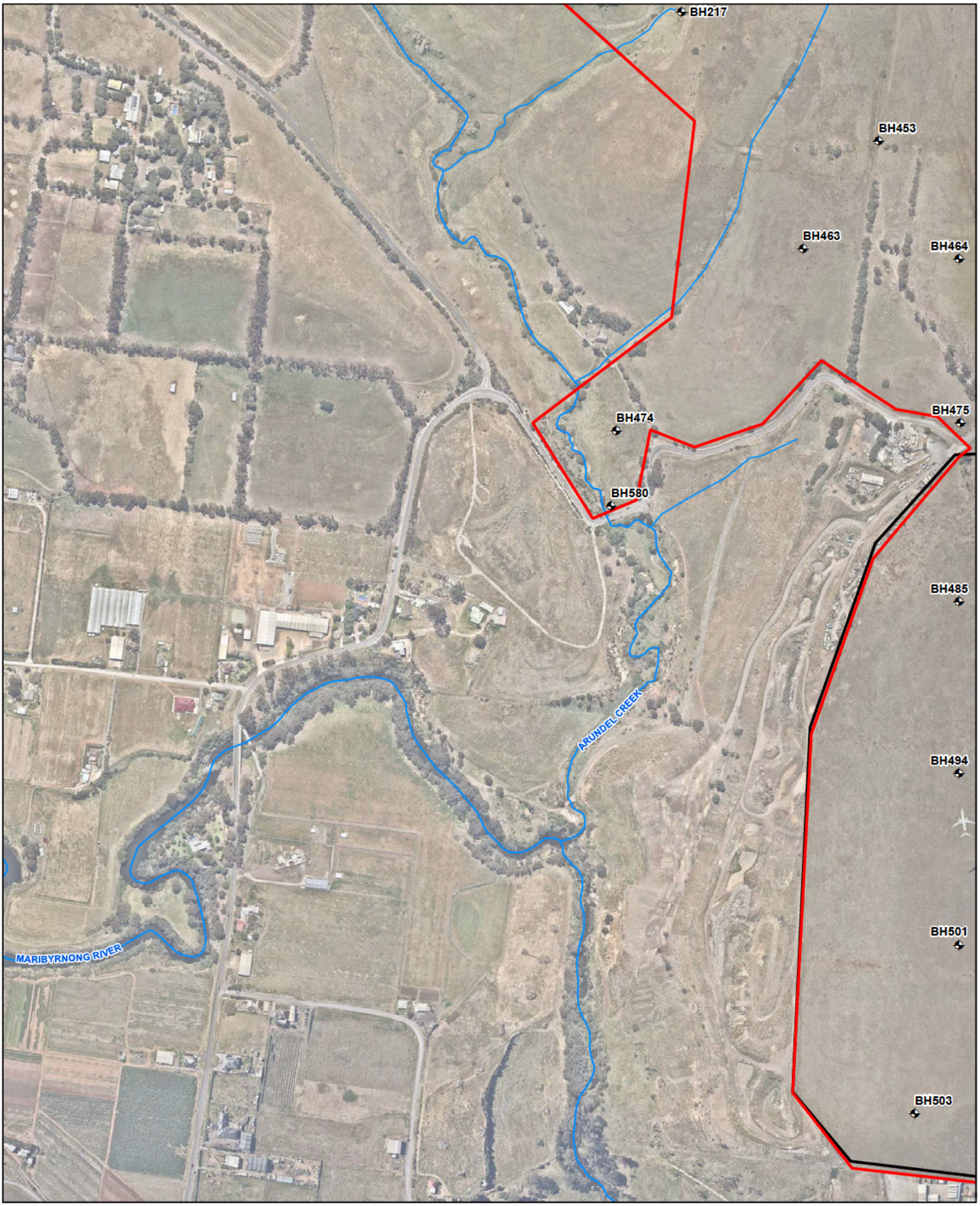
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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
AUSTRALIA PACIFIC AIRPORT (MELBOURNE) PTY LTD
Figure 18 - Inset E1

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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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Figure 19 - Inset E2

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Legend

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Site Layout and Sampling Locations

MELBOURNE AIRPORT, VIC
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Figure 20 - Inset E3

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Appendix B

171 Pages

Tables of Results

Table B1: Groundwater Gauging Results
Table B2: Groundwater Stabilised Parameters
Table B3: Groundwater Analytical Results
Table B4: Soil Analytical Results - Perfluorocarbons
Table B5: Soil Analytical Results – Pesticides, Herbicides, Phenols
Table B6: Soil Analytical Results – BTEX, TPH, PAH, Metals, Inorganics
Table B6: Soil Analytical Results
Table B7: Soil Leachability Results
Table B8: Sediment Analytical Results
Table B9: Surface Water Analytical Results
Table B10: Surface Water and Groundwater RPD Results
Table B11: Soil and Sediment RPD Results
Table B12: QAQC Results

Appendix I: Sky Road Extension Soil Investigation Report (Aurecon 2021)

aurecon

Bringing ideas to life

Sky Road Extension Soil Investigation Report

Australia Pacific Airports Melbourne (APAM)

Reference: 521506 (CP22024)

Revision: 1

2022-06-21



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Approval			
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Name		Name	
Title	Senior Consultant	Title	Project Manager

Contents

1 Investigation Summary 1
2 Introduction 2
2.1 Sky Road Project Description 2
2.2 Purpose and scope of soil investigation 3

3 Assessment criteria 4
4 Investigation approach and methods 5
5 Results 6
5.1 Site walkover 6
5.2 Field observations 6
5.2.1 Soil profile 6
5.2.2 Field screening 6
5.3 Chemical results 7
5.3.1 Screening against human health criteria 7
5.3.2 Screening against ecological criteria 7
5.3.3 Screening against AS 2159-2009 criteria for soil aggressivity 7
5.3.4 Screening against criteria for management of spoil 7

6 Findings and recommendations 9
6.1 Key findings 9
6.2 Recommendations 10

7 References 11

Appendices

Appendix A Figures
Appendix B – Approach and methodology
Appendix C Soil Logs
Appendix D Calibration Certificates
Appendix E Analytical Summary Tables
Appendix F Laboratory Documents
Appendix G Data quality assessment

Figures

Figure 2-1 Proposed road extent

End of document

Figure 1: Investigaiton Locations
Figure 2: Distribution of PFAS impacts in soils

Tables

Table 3-1 Summary of adopted assessment criteria
Table 5-1 Summary of soil profile

1 Investigation Summary

The soil investigation described in this report was undertaken to characterise soils within the footprint of a proposed extension to Sky Road at Melbourne Airport, and to identify requirements for management of waste spoil generated during project construction.

The scope included a site walkover, along with collection and chemical analysis of soil samples from eight test pits along the proposed road alignment and four locations within drainage channels intersecting the project area. Test pits were excavated to a maximum depth of 2 meters below ground level (m bgl) and no groundwater was observed.

Soils domains within the project area comprised shallow topsoil, anthropogenic fill and natural residual clays overlying basalt rock. No visual or olfactory evidence of soil contamination was observed in soils, with the exception of trace amounts of inert waste material in anthropogenic fill, including tiles, bricks and rubble.

Detected analytes in soils included trace elements, fluoride and per- and polyfluoroalkyl Substances (PFAS). No exceedances of adopted criteria for the protection of human and ecological health were reported and soils are considered unlikely to pose a significant risk of harm to project workers during construction.

Results indicate that soils are likely suitable for on-site retention (within the Melbourne Airport estate), noting that this scope may not have met sampling and analyses requirements defined in the Melbourne Airport PFAS Management Framework and further work may be required to confirm suitability of material for on-site retention. Any on-site retention of material would be subject to geotechnical suitability (where reuse is considered) and would require approval by APAM.

Where off-site disposal of waste soils is considered, results suggest that soils are likely to be classified as ‘Fill Material’, with the exception of shallow drainage sediment, which is likely to be classified as ‘Category D’ industrial waste. This classification is indicative and further sampling (including leachable analysis) is likely required to meet sampling density requirements for waste classification in accordance with Victorian regulatory requirements.

Recommendations for further works are described in detail in Section 6.2, and include:

- Development of an environmental management plan to manage the excavation, transport and disposal or reuse of waste spoil.
- Further investigation to meet requirements (if any) for off-site disposal or on-site retention as determined by regulatory or stakeholder requirements.

2 Introduction

Aurecon Group Pty Ltd ('Aurecon') was engaged by Australia Pacific Airports Melbourne ('APAM') to undertake detailed design of an extension to Sky Road west, located within the Melbourne Airport Business Park.

This report describes the results of a soil investigation undertaken to characterise soils within the project area, and to identify potential risks associated with encountering and disturbing soils that might be contaminated during road construction.

2.1 Sky Road Project Description

The Sky Road extension will comprise 750 m of industrial estate roadway and associated utilities. The road will connect with the existing extent of Sky Road West and continue west passing over Steele Creek, connecting with Reid Way and then extending west of Border Express and terminating with a cul-de-sac (Figure 2-1).

Ground disturbance activities associated with road construction will include:

- Shallow scraping to prepare the surface for road construction.
- Excavation of underground service trenches, including a sewer and stormwater infrastructure. Maximum excavation depth will be approximately 6 m below the current surface.

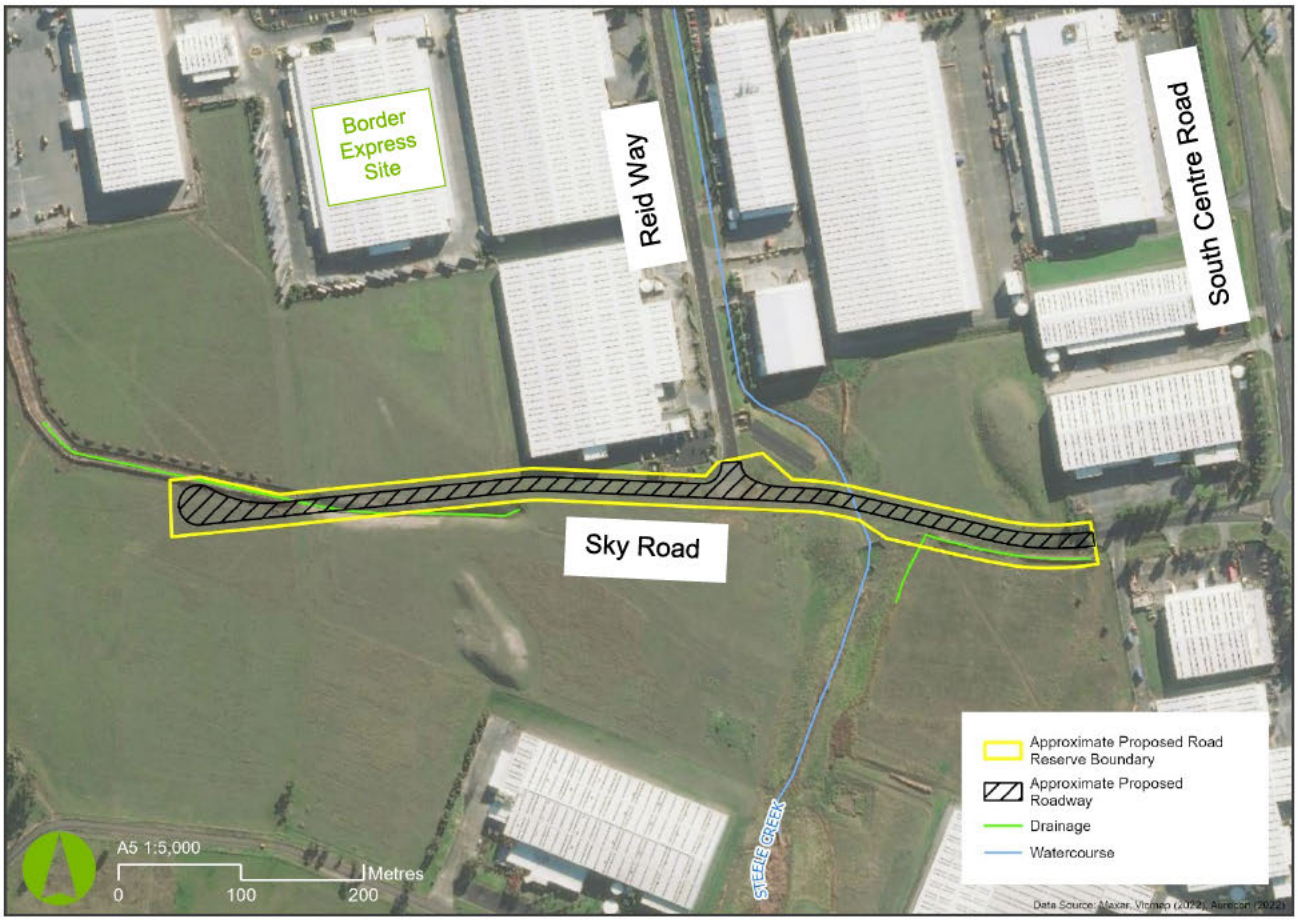


Figure 2-1 Proposed road extent

2.2 Purpose and scope of soil investigation

This limited soil investigation has been undertaken to characterise soils within the project ground disturbance footprint, and to identify risks and management requirements associated with potential soil contamination.

The scope of work completed for this assessment consisted of the following:

- Preparation of safety and environmental management plans and applications for relevant permits in accordance with APAM requirements.
- A site walk-over by a suitably qualified Environmental Scientist / Engineer to understand the nature and extent (or lack thereof) of potential impacts.
- Service clearance of proposed investigations using Dial Before You Dig searches, survey plans and physical scanning by a qualified service locator (electro-magnetic scanning and ground penetrating radar)
- Excavation of approximately 8 No. test pits using a backhoe/excavator to depths of approximately 2m below ground level (m bgl) (or until refusal) and:
  - Collection of soil samples from nominal depths at 0.1-0.2, 0.9-1.0, 1.4-1.5 and 1.9-2.0 m bgl or where a change in lithology or evidence of contamination is observed (i.e. staining or odour).
  - Logging of the observed soil profile within test pits along with any visual or olfactory evidence of contamination.
  - Scanning of samples for volatile organic compounds (VOCs) using a photo ionization device (PID)
- Collect of four shallow (sediment) samples from the upper 0.1 m of the soil / sediment profile from areas of drainage lines that lie within the footprint of Sky Rd.
- Analysis of selected samples for a range of contaminants by a laboratory with NATA accredited testing methodologies.
- Implementation of a quality assurance and quality control program to assess data quality.
- Assessment of chemical results against selected criteria for the protection of human and ecological health, and classification of waste spoil.
- Discussion on requirements for soil management during construction of the proposed road.
- Production of this soil investigation report.

3 Assessment criteria

Soil investigation results have been compared to selected Tier 1 criteria to identify potential risks of harm to human health and the environment from soil contamination. Exceedances of these criteria do not necessarily indicate that a risk is present, but rather that further investigation should be undertaken to determine the level of risk, if any.

Results have also been compared against criteria for the classification and management of waste spoil, both with regard to off-site disposal and on-site retention.

A summary of adopted assessment criteria is provided below in Table 3-1, along with descriptions and rationale for adoption.

Table 3-1 Summary of adopted assessment criteria

Type	Source	Description and rationale
Human Health	National Environmental Protection (Assessment of Site Contamination) Measure 1999 measure (NEPM) Health Investigation levels (HILs) (Schedule B1, table 1A (1)) and screening levels for vapour intrusion (HSLs) (Table 1A (3) for clay between 0 and up to 1 m) – commercial / industrial (C/I) setting (HIL D) and public open space (POS) setting (HIL C) PFAS National Environmental Management Plan (PFAS NEMP) 2.0 HILs (Table 2) – C/I setting (HIL D) and POS setting (HIL C)	HILs and HSLs have been selected to assess potential risk of harm to human health from exposure to excavated soils, either during project works or where soils are reused. It is assumed reuse would occur either within the boundary of the project area, or the broader airport estate and that the land-use scenario for any reuse areas would be commercial / industrial. A POS land use scenario has been selected to assess potential risks to worker health where exposure to soils occur. This POS exposure scenario used to develop NEPM and NEMP HILs assumes a child receptor – on this basis, the use of this scenario as a surrogate for adult workers utilising full personal protective equipment is considered conservative.
Ecological	NEPM Ecological Investigation Levels (EILs) (Table 1B (1-5) and screening levels (ESLs) (Table 1B(6) for fine soils) for fine soils PFAS NEMP ecological criteria for direct and indirect exposure (Table 3)	EILs and ESLs have been selected to assess potential risk of harm to ecological receptors where soils are reused. NEPM EILs have been calculated using measured pH values along with average values for clay content and cation exchange capacity (CEC) for basalt derived clay in the Greater Melbourne and Mitchell region described in *Mikkonen Et. Al. 2019*. It is assumed reuse would occur either within the boundary of the project area, or the broader airport estate and that the land-use scenario for any reuse areas would be commercial / industrial.
Concrete durability	Australian Standard 2159-2009 – Piling Design and Installation Table 6.4.2 (C) Exposure Classification for Concrete Piles in Soils	Exposure classification criteria have been selected to assess potential soil aggressivity to underground structures such as storm water drainage infrastructure.
Spoil management (reuse or disposal)	EPA Publication 1828.2 – waste disposal categories Victorian Government Gazette S26 – Classification of PFAS impacted spoil NEPM Management Limits for petroleum Hydrocarbons Melbourne Airport PFAS management Framework	Waste classification criteria defined in EPA publication 1828.2 and Gazette S26 have been used to provide an indication of disposal categories where off-site disposal of material to a licenced facility is considered as a spoil management option. PFAS management levels for storage at Melbourne Airport's Gate 11 facility or reuse within the airport estate have been adopted to give an indication of suitability for on-site retention of waste spoil.

4 Investigation approach and methods

Works were conducted on the 11th of May 2022 by suitably qualified field engineers from Aurecon. A detailed description of the approach and methods is presented in Appendix B.

Works were conducted in accordance with best practice guidance provided in the:

- National Environmental Protection (Assessment of Site Contamination) Measure 1999 measure as amended in 2013.
- PFAS National Environmental Management Plan 2.0.
- Standards Australia, 2005, Guide to the investigation and sampling of sites with potentially contaminated soil Part 1 and Part 2.

A summary of investigation locations is provided in Figure 1 at the end of this report.

5 Results

5.1 Site walkover

The proposed project area is relatively flat and comprises unsealed, grassed surfaces. The eastern half of the project alignment is intersected by Steele Creek, which runs north to south through a concrete culvert. Two large, vegetated swales are present in the eastern and western portion of the project area. These features are shown in Figure 1 at the end of this report.

No obvious indicators of contamination were observed during the site walkover; however, there is some potential for contaminants mobilised via stormwater generated in other areas of the airport estate to accumulate in drainage sediments. Four shallow soil samples were collected in drainage lines to characterise this material.

5.2 Field observations

5.2.1 Soil profile

A summary of the observed soil profile in test pits and drainage channels is provided below in Table 5-1. Detailed soil logs are provided in Appendix C. Groundwater was not observed during the investigation.

Soils are likely to derive from the Newer Volcanics group, which is present across much of the Melbourne Airport estate (Visualising Victoria's Groundwater, 2022). The origin of the anthropogenic fill is unknown.

Table 5-1 Summary of soil profile

Domain	Observed depth ranges	Description
Drainage sediment	0 – 0.1 m	Silty CLAY, brown, some roots and organic matter
Topsoil	0 – 0.6 m	Clays, silts, sands (fine to coarse grained) and gravels (fine to coarse grained), brown, grass and rootlets. Waste including bricks, tiles and rubble observed at TP01.
Anthropogenic Fill	0 – 1.4 m	Clays, sands (fine to coarse grained) and gravels (fine to coarse grained) and cobbles. Rubble observed above 0.3 m at TP03, and trace brick fragments observed above 0.4 m at TP05.
Residuals soils (natural material)	0.2 – 2.0 m	Clay, sands (fine to coarse grained), gravels (fine to coarse grained) and cobbles, brown with occasional grey and orange.
Rock	1.4 – greater than 2.0 m	Refusal on rock occurred at a number of locations. Rock was observed to be basalt and likely part of the Newer Volcanics geological unit.

5.2.2 Field screening

No visual or olfactory evidence was observed in soils or drainage sediment, with the exception of solid waste (bricks, tiles, rubble) observed in shallow fill at locations TP03 and TP05.

PID readings were generally below 10 ppm and do not indicate presence of significant concentrations of VOCs in soils. A calibration certificate for the PID is provided in Appendix D.

5.3 Chemical results

Detected analytes were limited to relatively low concentrations of trace elements, fluroide and PFAS. Full details of data collected are provided in:

- Appendix E: Analytical summary tables.
- Appendix F: Laboratory certificate of analysis.
- Appendix G: Data quality assessment.

5.3.1 Screening against human health criteria

No exceedances of adopted assessment criteria for the protection of human health were reported. No asbestos fibres were detected in shallow soils.

5.3.2 Screening against ecological criteria

No exceedances adopted assessment criteria for the protection of ecological health were reported.

5.3.3 Screening against AS 2159-2009 criteria for soil aggressivity

Results for sulfate and pH align with thresholds for classification as non-aggressive soils in accordance with AS 2159-2009 exposure classification criteria for concrete pi

5.3.4 Screening against criteria for management of spoil

On-site retention within the project area or elsewhere in within the Airport estate.

Concentrations of detected analytes (heavy metals, inorganic compounds and PFAS) reported in soils do not indicate a significant risk to human health or the environment should material excavated during construction of the road extension be retained on-site.

No exceedances of criteria for the protection of human an ecological health were reported, and of PFAS (total and leachable) reported in all soil domains were below thresholds for categorisation as ‘Management Level 1’ in accordance with the Melbourne Airport PFAS management framework. A summary of PFAS distribution across the project area is provided in Figure 2 at the end of this report.

The scope undertaken was not designed to meet soil assessment requirements defined in Section 3.2 of the Framework and further assessment may be required to confirm suitability for re-use of material within the project area or broader airport estate.

Any on-site retention of material would be subject to geotechnical suitability (where reuse is considered) and would require approval by APAM.

Off-site disposal

Analytical results for topsoil, anthropogenic fill and natural material generally align with thresholds classification as ‘Fill Material’ in accordance with EPA Publication 1828.2. Results for shallow drainage sediments align with thresholds for classification as ‘Category D’ industrial waste. This classification is indicative – the scope undertaken was not designed to meet volumetric sampling frequencies defined in Industrial Waste Resource Guideline (IWRG) 702 and further sampling and analysis would likely be required to classify material for off-site disposal in accordance with regulatory requirements.

Two results for nickel (in topsoil at TP02 between 0.1 – 0.2 m bgl and in natural clays at TP03 between 1.9 and 2.0 m bgl), were within thresholds for classification as ‘Category D’ Industrial waste. These soils were observed to be predominantly brown clays and likely derive from Newer Volcanics basalt, which covers much of the airport estate. Nickle enrichment is well documented in the Newer Volcanics group (Mikkonen Et. Al, 2019) and it is considered likely that reported nickel concentrations are naturally derived.

Should off-site disposal be considered as a management option, this material may be a candidate for designation as ‘Fill Material’ on this basis. It is noted that the remaining results for nickel in topsoil (and other observed domains) within the project area were within thresholds for classification as ‘Fill Material’.

Elevated zinc in exceedance of thresholds for classification of ‘Fill Material’ reported in a single sample (SS03) collected from shallow drainage sediments within a drainage line in the western half of the site. Zinc is common in urban drainage where surface runoff comes into contact with galvanized zinc surfaces such as cladding and roofing (Walsh et. al. 2004).

PFAS reported in all observed soil domains were below thresholds defined in Victorian Government Gazette S26 for designation as ‘Fill Material’.

Trace solid waste (bricks, tiles, rubble) were noted in shallow soils at TP01, TP03 and TP05, which would likely require removal prior to off-site disposal.

6 Findings and recommendations

6.1 Key findings

A summary of key findings of the soil investigation is provided below:

- No obvious indicators of contamination were observed during the site walkover.
- Soils observed within the project area include topsoil overlying anthropogenic fill and natural residual clays. Silty clays (drainage sediments) were observed within drainage lines. Natural soils (and possibly other domains) likely derived from the Newer Volcanics group, which is present across much of the Melbourne Airport estate.
- Test pits were excavated to a maximum depth of 2 m bgl and no groundwater was observed.
- No visual or olfactory evidence of contamination was observed, with the exception of solid waste (bricks, tiles, rubble) in shallow soils at three locations (TP01, TP03 and TP05).
- Detected analytes in soils included heavy metals, inorganic compounds and PFAS.
- No exceedances of adopted criteria for the protection of human and ecological health were reported in any of the observed soil domains. On this basis, interaction with soils during construction is unlikely to pose a significant risk of harm to project workers.
- Results of soil analysis indicate that natural material within the project area is non-aggressive in accordance with Australian Standard 2159-2009.
- Results of soil analysis for topsoil, anthropogenic fill and natural material align with thresholds for classification as 'Fill Material' in accordance with EPA Publication 1828.2 and Gazette S26, with the exception of a single result for Nickel in topsoil at TP02 between 0.1 – 0.2 m bgl align with thresholds for classification as 'Category D' industrial waste. This is considered likely due to natural enrichment in residual basaltic clay and material may be a candidate for EPA designation as 'Fill Material'.
- Results of soil analyses for shallow drainage sediments align with thresholds for classification as 'Category D' industrial waste due to elevated levels of zinc reported in a single sample.
- Classifications are indicative and further sampling is likely required to meet sampling density requirements for waste classification in accordance with Victorian regulatory requirements.
- Results of soil analysis do not indicate a significant risk of harm to human health or the environment should material be retained or re-used onsite (within the project area or the broader airport estate) within a commercial / industrial setting. Concentrations of PFAS in soils were below thresholds for categorisation as 'Management Level 1' in accordance with the Melbourne Airport PFAS Management Framework, noting that this scope may not have met sampling and analyses requirements defined in the Section 3.2 of the Framework and further work may be required to confirm suitability of material for on-site retention or reuse.

  Any on-site retention of material would be subject to geotechnical suitability (where reuse is considered) and would require approval by APAM.
- Soils below 2 m bgl were not investigated as part of this scope; however, the observed soil profile within the project area suggests these soils are likely to be of natural origin. Evidence of significant soil contamination was not identified in shallow soils and potential for significant contamination to be present in deeper, unsaturated natural material is considered to be low on this basis.

6.2 Recommendations

A summary of recommendations for further work include:

- Development of an environmental management plan (EMP) in accordance with APAM requirements, which should describe as a minimum:
  - The nature of proposed works.
  - Volumes and characteristics of material to be managed.
  - Health and safety protocols (including PPE requirements) for the works.
  - Spoil management options for excavated material.
  - Measures to satisfy regulatory requirements and minimise the risk of harm to humans and the environment during excavation, transport and reuse / retention / disposal of spoil.
- Where off-site disposal is proposed, further sampling may be required to classify material in accordance with Victorian regulatory requirements for waste classification.
- Where on-site retention / reuse is proposed, further sampling and assessment may be required to meet APAM requirements. Reuse will be subject to geotechnical suitability of material for the proposed reuse application and will require approval for APAM.
- Investigation of soils below 2 m bgl was outside the scope of this report. Although results of this investigation do not suggest significant contamination is likely to be present in unsaturated soils below the maximum investigation depth, further characterisation of deeper soils may be required to meet requirements for on-site retention or off-site disposal.
- Retention of material outside the Melbourne Airport Estate has not been considered as part of this investigation. This could only occur in accordance with Victorian regulatory requirements and would require further assessment.

7 References

EPA Vic, 2009, *Industrial Waste Resource Guideline 702 – Soil Sampling,* Environmental Protection Agency Victoria (EPA Vic) Melbourne.

EPA Vic, 2021, 1828.2: *Waste disposal categories – characteristics and thresholds*, Environment Protection Authority (EPA Vic) Melbourne.

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Hannah G. Mikkonen, Bradley O. Clarke, Raghava Dasika, Christian J. Wallis, Suzie M. Reichman, *Assessment of ambient background concentrations of elements in soil using combined survey and open-source data,* Science of The Total Environment, Volume 580, 2017, Pages 1410-1420.

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NEPC, 2013, *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1). Schedule B2. Guideline on Site Characterisation (B2): 2013*, National Environment Protection Council Service Corporation, Canberra, A.C.T.

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Standards Australia 2009, *Piling – Design and Installation,* Australian Standard – 2159-2009, Standards Association of Australia

State of Victoria, 2022, *Upper Limits for the Classification of PFAS-impacted Soil January 2022*, Victorian Government Gazette No 26, State of Victoria.

Walsh et. al. 2004*Urban stormwater and the ecology of streams,* CRC for Freshwater Ecology, Melbourne

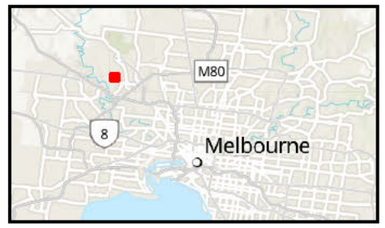
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Appendix A Figures

Figure 1 – Investigation Locations

Figure 2 – Summary of PFAS distribution





Legend

- Test Pit Locations
- Shallow Environmental Sampling Locations
- Approximate Proposed Road Reserve Boundary
- Approximate Proposed Roadway
- Drainage
- Watercourse

Source:
Aurecon (2022),
Vicmap (2022),
Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, GIS User Community. and Melbourne Airport

Date: 9/06/2022 Version: 1

A3 scale: 1:3,000

0 50 100 Metres

Job No: 521506

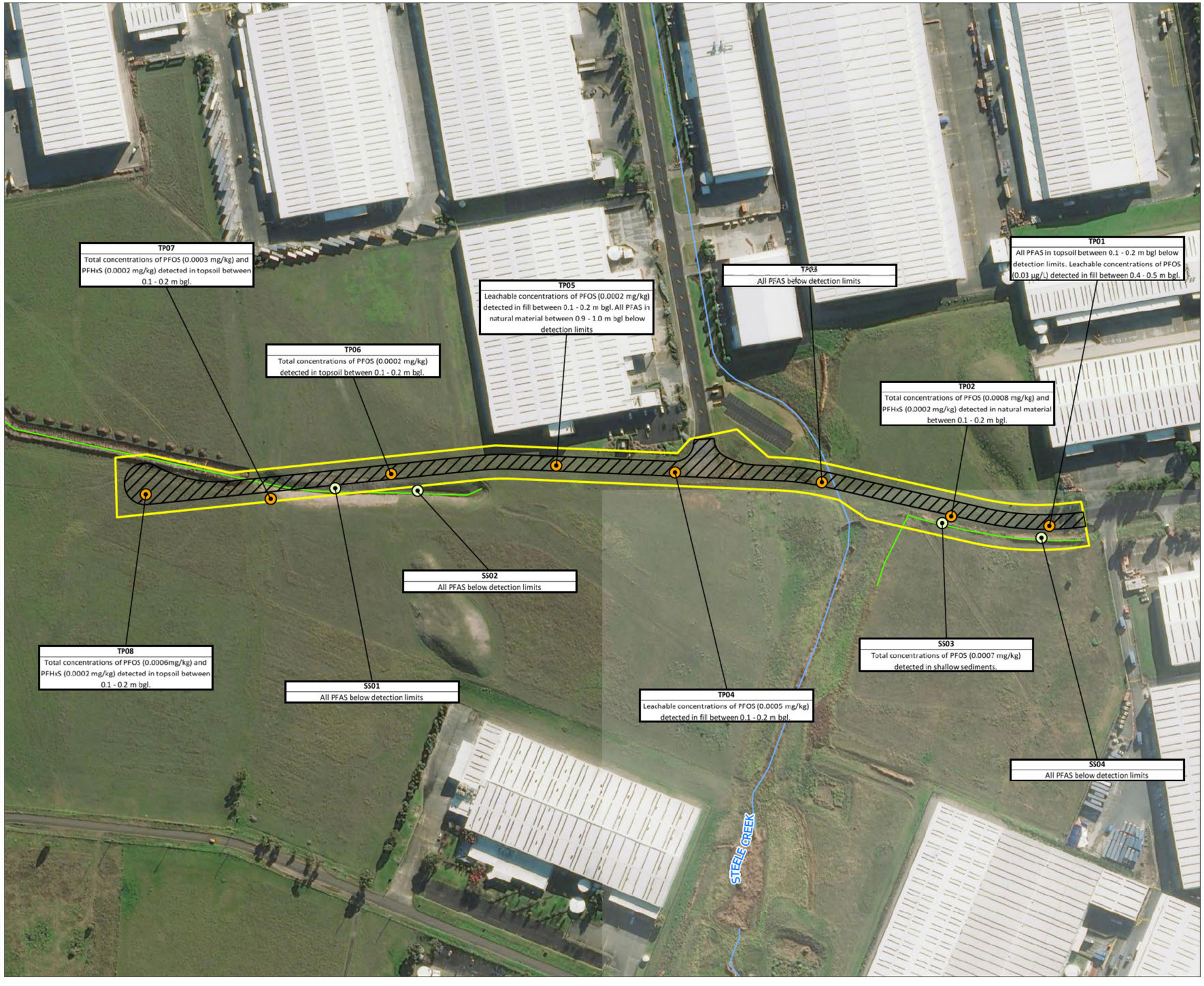
Coordinate System: GDA 1994 MGA Zone 55

Skye Road West Extension

Investigation Locations

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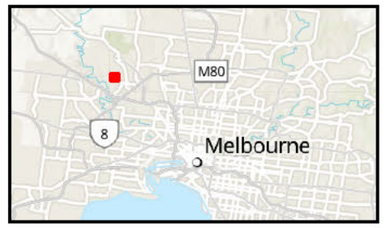
Author: Nick.Chen



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Author: Nick.Chen

aurecon



Legend

- Test Pit Locations
- Shallow Environmental Sampling Locations
- Approximate Proposed Road Reserve Boundary
- Approximate Proposed Roadway
- Drainage
- Watercourse

Source:
Aurecon (2022),
Vicmap (2022),
Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, GIS User Community. and Melbourne Airport

Date: 10/06/2022 Version: 1

A3 scale: 1:3,000

0 55 110 Metres

Job No: 521506

Coordinate System: GDA 1994 MGA Zone 55

Skye Road West Extension

Distribution of PFAS in Soils

Appendix B – Approach and methodology

Element	Description
Health and safety	Project specific health and safety documentation was prepared and approved by APAM as part of the permitting process.
Melbourne Airport consents and permits	The following approvals were obtained prior to commencing field work: ■ Airport Building Controller (ABC) exemption ■ APAM Permission to Commence work (PERCOW) ■ Landside excavation permit
Underground service clearance	■ Locations where excavations exceeded 0.1 m bgl depth were cleared for underground services using dial before you dig (DYBD) drawings and available survey information prior to arrival on site. ■ Clearance was confirmed by a certified service locator using ground electromagnetic scanning (EM) and penetrating radar (GPR). ■ Records of service clearance along with coordinates for cleared locations were provided to APAM and an excavation permit was for all locations with a proposed depth greater than 0.1 m bgl.
Investigation approach	Prior to commencement of sampling works, a site walkover was conducted to identity indicators or potential sources of contamination. No obvious evidence of contamination was identified; however, two drainage lines intersecting the proposed road alignment were observed. Four shallow sample locations were positioned in drainage lines as contaminants (particularly PFAS) can be mobilised via stormwater and accumulate in drainage sediments. Eight test-pit locations were determined by geotechnical scope requirements and were selected to provide approximately even coverage along the proposed road alignment.
Location and sample frequency	35 primary samples were collected from the excavator and 4 sediment sampling (SD) locations. Of these samples, 21 were analysed. ■ Soil was sampled up to a depth of 2 m at all excavator (EX) locations. At surface sample (SS) locations, soil was sampled up to a depth of 0.1 m. ■ EX locations had samples taken at the following depth intervals; 0.1 – 0.2 m, 0.4 – 0.5 m, 0.9 – 1.0 m, 1.4 – 1.5 m and 1.9 – 2.0 m. Each SS location had one sample collected at 0.0 – 0.1 m. ■ Collection of eight shallow (0 - 0.3 m bgl) samples for asbestos screening as per AS4964;
Sampling methodology	Surface and sediment sampling locations were collected using a hand trowel, which was decontaminated using a phosphate free detergent (Liquinox) and dionized water between sample locations. Samples from test pits were collected directly from either the excavator bucket or hand trowel using a fresh pair of nitrile gloves, with care taken to avoid material in contact with the excavator bucket reduce the risk of cross-contamination.
Field screening.	Soil collected at each HA, SS and SD location was logged, and any observations were also recorded (**Appendix B – Soil logs)**

Element	Description
Decontamination	■ Decontamination of reusable sampling equipment (hand trowel) was conducted using a three-stage method: 1. Removing sand and organics from trowel using tap water and brush. 2. Liquinox solution sprayed onto hand auger / trowel. 3. Rinsed with PFAS-free deionised water.
Sample storage and transport	■ Samples were collected into preservative free, laboratory provided glass and plastic (for PFAS) soil sample jars. All jars were sealed. Jars were labelled using a ball-point pen. ■ Jars were then placed into plastic zip-lock bags to eliminate potential for cross contamination during transport. Jars were deposited into lab provided coolers / eskies. ■ Eskies were chilled using ice stored in plastic zip-lock bags. All sample jars were placed on top of the ice, and the esky remained upright.
Laboratory analytical suites	Primary samples were analysed with the following analytical suites: ■ PFAS 28 compound suite[1] – total concentrations **(14 primary samples, two duplicate samples)** ■ PFAS 28 compound suite[1] – leachable concentrations **(six primary samples, two duplicate samples)** ■ PFAS 12 compound suite[2] – total concentrations (**four primary samples, one rinsate sample)** ■ EPA Publication 1282 Table 3[3] **(two primary samples)** ■ EPA Publication 1828 Table 2 limited[4] **(two primary samples, two duplicate samples)** ■ Limited suite 1[5] **(two primary samples)** ■ Limited suite 2[6] (**two primary samples)** ■ NEPM Metals[7] **(eight primary samples, one rinsate sample)** ■ Aggressivity suite[8] **(four primary samples)** ■ Asbestos (presence / absence) **(two primary samples)** Analysis of primary samples was undertaken by Australian Laboratory Services and secondary samples were analysed by Eurofins. Both laboratories utilise NATA accredited testing methodologies.

Element	Description
Quality assurance and quality control	A QAQC program was undertaken to assess the integrity of collected data, including: ■ Implementation of field sampling protocols and sample handling, preservation and transport controls. ■ Collection of one set of duplicate and triplicate samples for soil and analysis. ■ Collection of a single trip blank per batch of samples (water) to identify potential for cross contamination during transport. ■ Decontamination of reusable sampling equipment (hand trowel) using Liquinox, tap water and PFAS-free de-ionised water. Collection of a rinsate sample to identify potential cross contamination issues during sampling. ■ Internal laboratory QAQC, including laboratory duplicates; matrix spikes; control spikes; and holding time assessment. ■ Assessment of results of the QAQC program against data quality indicators provided in the NEPM, including completeness; comparability; representativeness; accuracy; and precision. Analysis of secondary samples was undertaken by Eurofins MGT using NATA accredited testing methodologies. The results of the QAQC program are detailed in **Appendix G.** Results of laboratory QAQC are presented along with laboratory certificates in **Appendix F.**

Notes:

1- PFAS 28 compound suite (total and leachable at pH 5): PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA< PFUnDA, PFDoDA, PFTrDA, PFTeDA, FOSA, MeFOSA, EtFOSA, MeFOSE, N-Ethyl perfluorooctane sulonamideoethanol, MEFOSAA, EtFOSAA, 4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS.

2- PFAS 12 compound suite (total):PFBS, PFHxS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, 4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS.

4- Publication 1828 table 3: As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Ti, Se, Ag, Zi, anions, cyanide, fluoride, phenols (halogenated), phenols (non-halogenated), monocyclic aromatic hydrocarbons (MAHs), benzene, polycyclic aromatic hydrocarbons (PAHs), benzo(a)pyrene, C6-C9 petroleum hydrocarbons, C10-C36 petroleum hydrocarbons, polychlorinated biphenyls (PCBs)chlorinated hydrocarbons, organochlorine pesticides (OC)

3- Publication 1828 table 2 limited: Ag, As, Ba, Be, B, Cd, Cr, Cu, Hg, Mg, Ni,, Pb, Sb, Se, Sn, Zn, TRH, PAH, Phenols, OCP, PCV, HALVOL, BTEX, Styrene, MEK, Hexachlorobutadiene, Trichlorobenzenes (total), bis(2-ehtylhexyl) phthalate), 2.4-DNT, nitrobenzene, 2.4-D, CN, Cr, NCHO, F, pH.

5- Limited suite 1: Total recoverable Hydrocarbons (TRH)(C6-C40)/ Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN) / PAHs /phenols and metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)

6- Limited suite 2: TRH(C6-C40)/BTEXN /PAH/OC and Organophosphorus (OP) pesticides / Polychlorinated Biphenyls (PCBs), metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)

7- NEPM metals: As, B, Ba, Be, Cd, Cr, Co, Cu, Mn, Ni, Pb, Se, V, Zn, Hg

8- Aggressivity suite: Sulfate, chloride and pH

Appendix C Soil Logs

aurecon

850 Collins Street
Docklands
Victoria 3008

TEST PIT No : TP01

Client: Melbourne Airport
Project: Sky Road West Extension
Job No: 521506
Location: Sky Road Melbourne Airport

RL Datum: AHD
Contractor: Fry's Earthmoving
Operator: Andrew Fry
Equipment: 5t Excavator

Easting: 310857.000 mE
Northing: 5825518.000 mN
Surface RL: 90.800 mAHD
Date: 05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	90.5	0.0		TOPSOIL: Silty SAND fine to coarse grained, brown, low plasticity silt, with fine to coarse grained, angular to sub-angular gravel, rootlets, grass, bricks, tiles and rubble	SM		D				TOPSOIL
					FILL: CLAY high plasticity, brown, with fine to coarse grained, angular gravel, trace basalt cobbles		St		ES			0.10m to 0.20m: TP01_0.1-0.2_220511_ES FILL
					0.2m: reducing gravel/cobble content							
		90.0	0.5		0.4 - 0.5m: with fine to coarse grained sand, no gravel content		VSt	~PL	D			0.40m to 0.50m: TP01_0.4-0.5_220511_ES TP01_0.4-0.5_220511_D
					0.8m: with fine to coarse grained sand, trace fine to coarse grained gravel	CH						
									D			0.90m to 1.00m: TP01_0.9-1.0_220511_D
		89.5	1.0				H		ES			1.00m to 1.10m: TP01_1.0-1.1_220511_ES
								<PL				
									ES			1.30m to 1.40m: TP01_1.3-1.4_220511_ES
			1.5		Test Pit TP01 Terminated at 1.40 m Refusal							1.40m: Refusal on inferred basalt

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper

Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

MELB_MODIFIED_JM_V3-EDITED.GLB Log AURECON MELB TEST PIT SKY ROAD WEST.GPJ <<DrawingFile>> 17/06/2022 15:42 10.02.00.04 Developed by Datgel

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850 Collins Street
Docklands
Victoria 3008

TEST PIT No : TP02

Client: Melbourne Airport
Project: Sky Road West Extension
Job No: 521506
Location: Sky Road Melbourne Airport

RL Datum: AHD
Contractor: Fry's Earthmoving
Operator: [redacted]
Equipment: 5t Excavator

Easting: 310787.000 mE
Northing: 5825519.000 mN
Surface RL: 90.600 mAHD
Date: 05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	90.5	0		TOPSOIL: Silty CLAY medium plasticity, brown, trace fine to coarse grained sand, rootlets, grass	CI	St - VSt	<PL - ~PL	ES			TOPSOIL 0.10m to 0.20m: TP02_0.1-0.2_220511_ES
					CLAY high plasticity, brown							RESIDUAL SOIL
					0.3m: with fine to coarse grained sand				B			0.30m to 0.50m: TP02_0.3-0.5_220511_B 0.40m to 0.50m: TP02_0.4-0.5_220511_ES
		90.0	0.5				H	~PL				
					0.7m: brown, mottled pale grey brown, with fine to coarse grained sand, trace fine to coarse grained gravel, trace cobbles	CH	VSt					
			1.0						ES			0.90m to 1.00m: TP02_0.9-1.0_220511_ES TP02_0.9-1.0_220511_D
		89.5					H	<PL - ~PL				
					1.2m: increasing gravel/cobble content							
									ES			1.40m to 1.50m: TP02_1.4-1.5_220511_ES
			1.5		Test Pit TP02 Terminated at 1.50 m Refusal							1.50m: Refusal on inferred basalt
		89.0										

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper
Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

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Victoria 3008

TEST PIT No : TP03

Client: Melbourne Airport
Project: Sky Road West Extension
Job No: 521506
Location: Sky Road Melbourne Airport

RL Datum: AHD
Contractor: Fry's Earthmoving
Operator: [redacted]
Equipment: 5t Excavator

Easting: 310683.880 mE
Northing: 5825537.810 mN
Surface RL: 90.200 mAHD
Date: 05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration)	Comment
E	(None encountered)	90.0	0.0		FILL / REWORKED NATURAL: CLAY high plasticity, dark brown, trace fine to coarse grained sand, trace fine to coarse grained, angular to sub-angular gravel, rootlets, grass, rubble	CH		<PL - ~PL	ES		2 6 10 14 18	FILL / REWORKED NATURAL 0.10m to 0.20m: TP03_0.1-0.2_220511_ES
		89.5	0.5		CLAY high plasticity, brown		S - F		ES			RESIDUAL SOIL 0.40m to 0.50m: TP03_0.4-0.5_220511_ES
		89.0	1.0		1.0m: grading to grey brown	CH	St	~PL	ES			0.90m to 1.00m: TP03_0.9-1.0_220511_ES
			1.5		1.4m: lense of extremely weathered material, pale grey, 5 - 10%		VSt	<PL - ~PL	ES			1.40m to 1.50m: TP03_1.4-1.5_220511_ES
		88.5	2.0		Sandy CLAY high plasticity, brown, fine to coarse grained sand, trace fine to medium grained, sub-angular gravel	CH	H	<PL	D			1.90m to 2.00m: TP03_1.9-2.0_220511_ES TP03_1.9-2.0_220511_D
					Test Pit TP03 Terminated at 2.00 m Target depth, backfilled							

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper

Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

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TEST PIT No : TP04

Client: Melbourne Airport
Project: Sky Road West Extension
Job No: 521506
Location: Sky Road Melbourne Airport

RL Datum: AHD
Contractor: Fry's Earthmoving
Operator: [redacted]
Equipment: 5t Excavator

Easting: 310569.630 mE
Northing: 5825545.470 mN
Surface RL: 89.600 mAHD
Date: 05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	89.5	0.0		FILL: CLAY high plasticity, brown, fine to medium grained sand, trace fine to medium grained, angular gravel	CH	VS	<PL - ~PL	ES			FILL 0.10m to 0.20m: TP04_0.1-0.2_220511_ES
							F					
			0.5		Clayey SILT high plasticity, brown, with fine to coarse grained sand	MH			ES			0.40m to 0.50m: TP04_0.4-0.5_220511_ES RESIDUAL SOIL
		89.0			CLAY high plasticity, brown			~PL				0.50m to 0.60m: TP04_0.5-0.6_220511_B
					0.7m: brown and pale grey, with fine to coarse grained sand, trace fine to coarse grained gravel, trace extremely weathered basalt cobbles							
			1.0				St - VSt	<PL - ~PL	ES			0.90m to 1.00m: TP04_0.9-1.0_220511_ES
		88.5			1.1m: reducing sand/gravel/cobble content	CH						
			1.5						ES			1.40m to 1.50m: TP04_1.4-1.5_220511_ES
					1.5m: trace fine to medium grained sand, trace fine to medium grained, sub-angular gravel		H	~PL				
		88.0										
			2.0		Test Pit TP04 Terminated at 1.90 m Refusal				D			1.90m: Refusal on inferred basalt

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper

Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

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Victoria 3008

TEST PIT No : TP05

Client:	Melbourne Airport	**RL Datum:**	AHD	**Easting:**	310477.240 mE
Project:	Sky Road West Extension	**Contractor:**	Fry's Earthmoving	**Northing:**	5825550.810 mN
Job No:	521506	**Operator:**	[redacted]	**Surface RL:**	88.300 mAHD
Location:	Sky Road Melbourne Airport	**Equipment:**	5t Excavator	**Date:**	05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	88.0	0.0		FILL: CLAY high plasticity, dark brown, trace fine to coarse grained sand, trace fine to coarse grained, angular gravel, trace angular cobbles, trace brick fragments, rubble rootlets, grass	CH	F	<PL - ~PL	ES			FILL 0.10m to 0.20m: TP05_0.1-0.2_220511_ES
			0.5		CLAY high plasticity, dark brown		St - VSt		ES			0.40m to 0.50m: TP05_0.4-0.5_220511_ES RESIDUAL SOIL
		87.5			0.8m: pale grey-brown, with fine to coarse grained sand, with fine to coarse grained, angular gravel, trace basalt cobbles	CH	H		B			0.80m to 0.90m: TP05_0.8-0.9_220511_B
									ES			0.90m to 1.00m: TP05_0.9-1.0_220511_ES
			1.0		Test Pit TP05 Terminated at 1.10 m Refusal							1.10m: Refusal on inferred basalt

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper
Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

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850 Collins Street
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Victoria 3008

TEST PIT No : TP06

Client: Melbourne Airport
Project: Sky Road West Extension
Job No: 521506
Location: Sky Road Melbourne Airport

RL Datum: AHD
Contractor: Fry's Earthmoving
Operator: [redacted]
Equipment: 5t Excavator

Easting: 310348.920 mE
Northing: 5825544.210 mN
Surface RL: 86.200 mAHD
Date: 05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	86.0	0.0		TOPSOIL: CLAY high plasticity, dark brown, rootlets, grass	CH	VS		ES			TOPSOIL 0.10m to 0.20m: TP06_0.1-0.2_220511_ES
		85.5	0.5		CLAY high plasticity, dark brown		St - VSt	~PL	ES			RESIDUAL SOIL 0.40m to 0.50m: TP06_0.4-0.5_220511_ES
		85.0	1.0		1.0m: pale grey, trace fine to medium grained, sub-angular gravel	CH	St	>PL - ~PL	ES			0.90m to 1.00m: TP06_0.9-1.0_220511_ES
		84.5	1.5		1.5m: grey-brown, reducing gravel content			~PL	ES			1.40m to 1.50m: TP06_1.4-1.5_220511_ES
			2.0		Test Pit TP06 Terminated at 2.00 m Target depth, backfilled				ES			1.90m to 2.00m: TP06_1.9-2.0_220511_ES

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper
Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

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850 Collins Street
Docklands
Victoria 3008

TEST PIT No : TP07

Client:	Melbourne Airport	**RL Datum:**	AHD	**Easting:**	310255.180 mE
Project:	Sky Road West Extension	**Contractor:**	Fry's Earthmoving	**Northing:**	5825524.970 mN
Job No:	521506	**Operator:**	[redacted]	**Surface RL:**	88.200 mAHD
Location:	Sky Road Melbourne Airport	**Equipment:**	5t Excavator	**Date:**	05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	88.0			TOPSOIL: CLAY high plasticity, dark brown, rootlets, trace grass	CH	St	<PL	D			TOPSOIL 0.10m to 0.20m: TP07_0.1-0.2_220511_ES TP07_0.1-0.2_220511_D
					CLAY high plasticity, dark brown		H	~PL	ES			RESIDUAL SOIL 0.40m to 0.50m: TP07_0.4-0.5_220511_ES
		87.5	0.5		0.5m: dark brown and pale grey, with fine to coarse grained sand, trace fine to medium graind, angular gravel, trace rounded, basalt cobbles			<PL	B			0.90m to 1.00m: TP07_0.9-1.0_220511_ES TP07_0.9-1.0_220511_B
			1.0		1.0m: 400mm sub-rounded boulders	CH						
		87.0			1.2m: grey-brown, reducing gravel/cobble/boulder content, trace fine grained sand		St - VSt		D			1.40m to 1.50m: TP07_1.4-1.5_220511_ES TP07_1.4-1.5_220511_D
			1.5					<PL - ~PL				
		86.5							ES			1.90m to 2.00m: TP07_1.9-2.0_220511_ES
			2.0		Test Pit TP07 Terminated at 2.00 m Target depth, backfilled							

Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper
Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

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Victoria 3008

TEST PIT No : TP08

Client: Melbourne Airport
Project: Sky Road West Extension
Job No: 521506
Location: Sky Road Melbourne Airport

RL Datum: AHD
Contractor: Fry's Earthmoving
Operator: [redacted]
Equipment: 5t Excavator

Easting: 310157.960 mE
Northing: 5825528.440 mN
Surface RL: 89.400 mAHD
Date: 05/11/2022

Logged By: PKA
Checked By: LKR

Method/Shoring	Water	Elevation (m)	Depth (m)	Graphic Log	Material Description	Classification Symbol	Consistency / Rel. Density	Moisture	Sample	In Situ Testing	DCP Values (Blows/100mm Penetration) 2 6 10 14 18	Comment
E	(None encountered)	89.0	0.5		TOPSOIL: CLAY high plasticity, dark brown, trace rootlets, trace grass	CH		<PL - ~PL	ES			TOPSOIL 0.10m to 0.20m: TP08_0.1-0.2_220511_ES 0.40m to 0.50m: TP08_0.4-0.5_220511_ES
		88.5	1.0		CLAY high plasticity, grey brown	CH	F	~PL	D			RESIDUAL SOIL 0.90m to 1.00m: TP08_0.9-1.0_220511_ES TP08_0.9-1.0_220511_D
		88.0	1.5		1.6m: dark grey mottled pale orange and dark grey				ES			1.40m to 1.50m: TP08_1.4-1.5_220511_ES
		87.5	2.0		1.8m: trace cobbles		F - St		ES			1.90m to 2.00m: TP08_1.9-2.0_220511_ES
					Test Pit TP08 Terminated at 2.00 m Target depth, backfilled							

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Method
EX excavator
NE natural exposure
EE existing excavation
BB bulldozer blade
RP ripper
Shoring

Water
◄ complete water loss
► water inflow
▼ water level
P partial water loss
N none encountered

USC Classification
GW well graded gravels
GP poorly graded gravels
GM sity gravel
GC clayey gravel
ML inorg silts low plastic
MH inorg silts high plastic
OL org silts low plastic
OH org silts high plastic
SW well graded sands
SP poorly graded sands
SM sity sands
SC clayey sands
CL inorg clay low plastic
CI inorg clay med plastic
CH inorg clay high plastic
Pt peat of high org soils

Consistency
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard

Density
VL very loose
L loose
MD medium dense
D dense
VD very dense

Moisture
D dry
M moist
W wet
PL plastic limit

Soil Samples
BK bulk
DT disturbed
UT U63 push tube
WS water

In Situ Testing
PP pen penetrometer
VS vane shear

Laboratory Results
UC undrained unconsol cohesion
UF undrained unconsol friction angle
MC moisture content
DD dry density
LL liquid limit
PL plastic limit
LS linear shrinkage
CC undrained consol cohesion
CF undrained consol friction angle
FH falling head permeability
CH constant head permeability
CBR californian bearing ratio

Appendix D Calibration Certificates

Equipment Calibration Form
RKI GX-6000 PID

Enqip #: 16702

Company: Aurecon Australasia Pty Ltd

Consultant: [redacted]

PO #: 521506

Certificate #: 24627

INSTRUMENT IDENTIFICATION

Model Number: GX-6000

Serial Number: 52J0193501-5RN

INSPECTION RECORD

Flow Rate:	PASS	**Inlet Filter:**	PASS
Buzzer:	PASS	**Date & Time:**	PASS

CALIBRATION DETAILS

Parameters	Standard	Result
Air	0.0 ppm	0.0 ppm
Isobutylene	100.0 ppm	99.9 ppm

Calibration Successful: YES

Calibrated By: [redacted]

Test Date: 10/05/2022

enqip
116 Thistlethwaite St, South Melbourne 3205
P 1300 218 987
E info@enqip.com.au | **W** www.enqip.com.au

Appendix E Analytical Summary Tables

Appendix F Laboratory Documents

Appendix G Data quality assessment

QAQC program was implemented to assess the completeness, comparability, representativeness, precision and accuracy of the data and their fitness for the scope and objectives of the investigation.

The results of the QAQC program are summarised below in Table B1. All objectives for the limited QAQC program were met and data is generally considered of adequate quality for the purposes of the limited soil and groundwater investigation and the conclusions drawn.

Results for laboratory duplicates and RPD calculations are provided in Appendix E, and Laboratory QAQC reporting documents are provided along with certificates of analysis in Appendix F.

Table B QAQC Summary

Data quality indicators	Components	Objective	Outcome	Notes
Completeness	Carry out works in accordance with proposed scope.	All locations sampled, and appropriate chemicals of concern and assessment criteria selected.	✓	**All objectives met**
	All works to be completed by an appropriately qualified and experienced site engineer	Appropriately experienced sampler, adequate sampling procedures and documentation	✓	**All objectives met**
	All samples delivered to the laboratory within the required holding times for requested analysis	Laboratory holding times complied with	✓	**All objectives met** Holding time limits were exceeded for several analytes (moisture content, pH, fluoride, mercury and BTEX) in a small number of samples due to additional analytical requests. For mercury and fluoride, the holding times were exceeded by a single day. For the remaining analytes, results align with those for samples analysed within holding times and from similar soil domains. These non-conformances are not considered to represent a significant data quality issue on that basis.
	All LORs are below adopted assessment criteria	LORs are below adopted assessment criteria	✓	**All objectives met**
Comparability	Consistent sampling methods used for all soil and groundwater samples	Consistent procedures throughout field works and laboratory testing	✓	**All objectives met**
Representative -ness	Shallow soils as per proposed scope	Appropriate media sampled	✓	**All objectives met**

Data quality indicators	Components	Objective	Outcome	Notes
Precision	Duplicate pairs collected at a frequency of ~10% of primary samples Relative percent differences between primary and duplicate results less than 30% - 50 %	Field and inter-lab duplicates	✓	**All objectives met**
Accuracy	One rinsate blank collected after every day of sampling from reusable equipment On trip blank sent with each batch of samples to be analysed where evidence of cross contamination is observed.	Rinsate blanks - No results above detection limits. Trip blanks - evidence of significant cross contamination	✓	**All objectives met** **(trip blanks not analysed as no evidence of significant cross contamination observed)**

Document prepared by

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Appendix J: Soil Contamination Assessment: Proposed Warehouse, Lot 7, Sky Road, Melbourne Airport, Victoria 3045 (A.S.James 2023)

Soil Contamination Assessment

Soil Contamination Assessment

Proposed Warehouse, Lot 7, Sky Road, Melbourne Airport, Victoria 3045

Report Prepared for:
Australia Pacific Airports (Melbourne) Pty Ltd

Report Prepared by A.S.James Pty Ltd

20 October 2023

122487 E1



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20 October 2023

Australia Pacific Airports (Melbourne) Pty Ltd
Locked Bag 16
Tullamarine VIC 3043

Attention: [redacted]

Ref: 122487 E1

Re: Soil Contamination Assessment – Proposed Warehouse, Lot 7, Sky Road, Melbourne Airport, Victoria 3045

Background

A.S.James Pty Ltd (A.S.James) was commissioned to undertake environmental sampling and analysis of the soils underlying the site of the proposed warehouse located at Lot 7, Sky Road, Melbourne Airport. The supplied architectural drawings provided for the site indicate that the site will be developed for warehousing and office space containing associated hardstand areas for truck and car access and egress.

The client (Australia Pacific Airports (Melbourne) Pty Ltd) requested intrusive investigation and laboratory analysis of the underlying soils to determine the presence / absence of Per and Poly-Fluoroalkyl Substances (PFAS) and also for other potential contaminants of concern for the site.

ASJ were commissioned by the client to provide environmental soil quality information for the development of the site, the client requested a soil contamination assessment (SCA) with limited sampling and analysis to determine the in-situ soils environmental quality in accordance with the Airports (Environment Protection) Regulations 1997 (the Regulation), APAM Melbourne Airport PFAS Management Framework (March 2022) and EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds* guidelines.

A.S.James proposed to undertake drilling at twenty borehole test locations. On day of intrusive investigation only thirteen borehole test locations could be accessed due to site occupation for construction site by others (Boreholes 15, 17, 18, 19 and 20) in south of the site and waterlogged conditions at Boreholes 12 and 16, due to construction site dewatering activities.

Site Inspection

A.S.James undertook site reconnaissance prior to intrusive investigation. This reconnaissance indicated that the site was essentially flat topographically. The site was vacant and vegetated with pasture grasses and noxious weeds. The surface drainage of the site is poor-moderate.

No evidence of distressed vegetation was observed. No surface-dwelling asbestos containing material was encountered during investigation. No fuel storage, underground fuel storage tanks or aboveground fuel storage tanks were reported.

Soil Sampling Rationale

To determine the environmental quality of the in-situ soils underlying the site, it was proposed to drill twenty bore test locations, only thirteen of these boreholes could be accessed on day of intrusive investigation.

A total of twenty-three (23) soil samples were analysed for PFAS. The soil samples were analysed primarily for the purposes of determining the presence / absence of PFAS within the soils to allow for determination of the soils management level and also for categorising the soils in accordance with EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds* guideline.

All in-situ soil samples were retrieved from a SPT sampler using disposable nitrile gloves.

Regional Geology

The Geological Survey of Victoria, 1:63,360 Series, Sunbury sheet, indicates the site to be underlain by Quaternary Olivine Basalts, which are generally referred to as "*Newer Volcanics*". Weathering of the basalt flows has typically resulted in shallow, surface residual silts underlain by firm to stiff residual clays which grade to variably weathered basalt at depth. The residual clays are generally highly reactive and the depth to rock is often highly variable over short distances. The site is also underlain by Colluvial deposits associated with “Steele Creek”. The regional geology is depicted below.

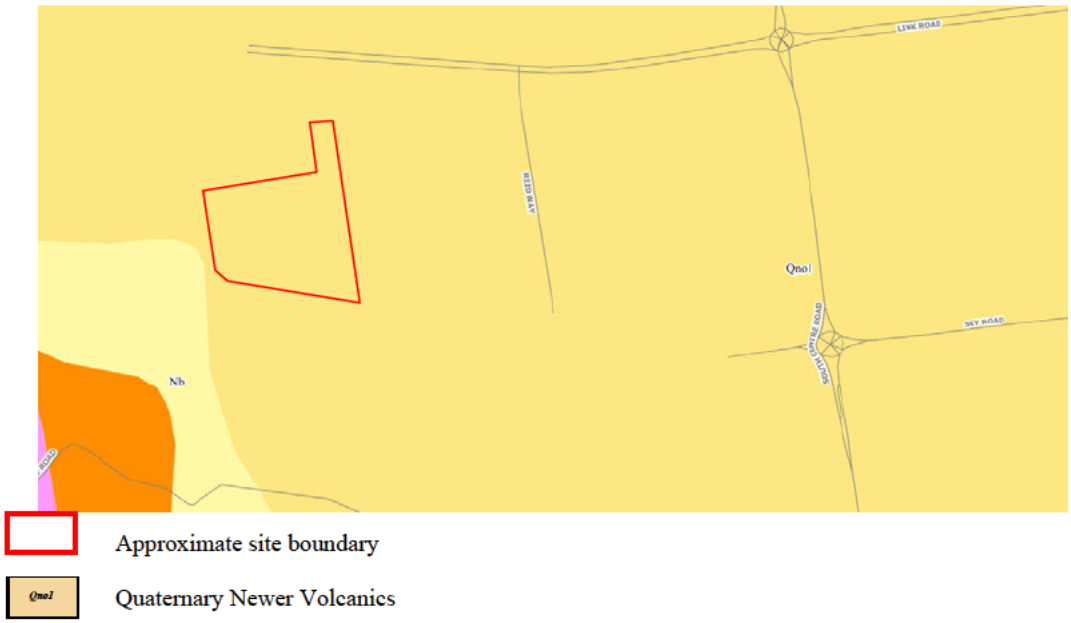


Figure 1 - Retrieved from GeoVic provided by the Dept. of Primary Industries Victoria

Site Specific Geology

The intrusive investigation and site inspection has indicated a layer of natural Silt overlying natural Clay was present across the site. No potential asbestos containing materials were observed in any of the boreholes. No hydrocarbon odours or staining were encountered, refer to Appendix A for borelogs and below table for tabulated general site geology encountered.

Approximate Depths (from/to) (m bgl)	Soil Type	Description of Underlying Lithology
Domain 1		
0.0-0.2	Natural Silt (MH)	Brown, Clayey Silt, root zone present, moist, no asbestos containing material, no hydrocarbon odour, no hydrocarbon staining
Domain 2		
0.2-0.6	Natural Clay (CH)	Brown-grey, Silty Clay containing carbonation at depth, moist, no asbestos containing material, no hydrocarbon odour, no hydrocarbon staining

Table 1: Summary of Geology underlying Site

Methodology

A total of twenty-six (26) soil samples were retrieved from the in-situ soils with twenty-three (23) soil samples analysed for contaminants associated with Airports (Environment Protection) Regulations 1997 Soil Pollution - Accepted Limits criteria and EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds* guidelines. Twenty-three (23) soil samples were analysed for Per and Poly-Fluoroalkyl Substances (PFAS). The sampling density was not in strict accordance with the EPA Victoria

IWRG 702-2009 *Soil Sampling* Guideline but was considered suitable for preliminary purposes, refer to Figure 1 of Appendix A for individual soil sampling locations. All soil samples were retrieved from the SPT sampler using disposable nitrile gloves.

After completion of fieldwork, the soil samples were transported to the primary and secondary laboratories. The primary laboratory used by A.S.James to conduct testing of the soil samples retrieved from this site was ALS (Environmental Division), a laboratory accredited by the National Association of Testing Authorities, Australia (NATA). The duplicate soil sample(s) were sent to Eurofins (Secondary Laboratory), also a laboratory accredited by the National Association of Testing Authorities, Australia (NATA). The table below indicates the number of soil samples tested and analytical suite utilised based on primary contaminants of concern.

Soil Sample Location	No. of Soil Samples Retrieved	No. of Soil Samples Tested	Analytical Suite
Domain 1			
Natural Silt	13	3	EPA Victoria Publication 1828.2 Screen
		10	Heavy Metals, Polyaromatic Hydrocarbons, Petroleum Hydrocarbons and pH
		13	Per and Poly-Fluoroalkyl Substances (PFAS)
Domain 2			
Natural Clay	13	10	Heavy Metals, Polyaromatic Hydrocarbons, Petroleum Hydrocarbons and pH
		10	Per and Poly-Fluoroalkyl Substances (PFAS)

Table 2: Number of Soil Samples Tested and Analytical Suites Used

Data Quality Objectives

Data Quality Objectives: The Data Quality Objectives (DQOs) for this site investigation have been developed in accordance with NSW EPA Contaminated Land Guidelines - *Sampling design part 1 - application*. The following outlines the DQO process for this investigation.

State the problem: Australia Pacific Airports (Melbourne) Pty Ltd commissioned A.S.James Pty Ltd to complete the following:

a) Complete a Soil Contamination Assessment for the proposed warehouse development, located at Lot 7, Sky Road, Melbourne Airport, Victoria 3045, refer to Figure 1 of Appendix A. This investigation included the assessment of the contamination status of the soils underlying the site at thirteen borehole test locations (*twenty borehole test locations were initially proposed*), refer Figure 1 of Appendix A.

b) The investigation shall conform to the adopted guidelines stated in the Airports (Environment Protection) Regulations 1997 (the Regulation), Melbourne Airport PFAS Management Framework (March 2022) and EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds* guidelines.
c) Determine if the site's environmental quality is suitable for its intended land use as Commercial / Industrial based on Airports (Environment Protection) Regulations 1997 Soil Pollution - Accepted Limits criteria.
d) Determine the presence / absence of PFAS within the soils to allow for determination of the soils management level in accordance with Melbourne Airport PFAS Management Framework (March 2022).
e) Determine the insitu soils EPA Victoria Waste Soil Classification should the soils be disposed of offsite.
f) Budget constraints will also apply, as this is assessment is limited in its scope, the budget must be adhered to and should further assessment be required the further works necessary will be outlined.

Identify the decision: The main objective of the assessment is to determine whether the contaminant concentrations in the underlying soils exceed the adopted Airports (Environment Protection) Regulations 1997 Soil Pollution - Accepted Limits criteria considered protective of human health in a Commercial / Industrial land use setting.

Determine the presence / absence of PFAS within the underlying soils to allow for determination of the soils management level in accordance with Melbourne Airport PFAS Management Framework (March 2022)

Determine the insitu soils EPA Victoria Waste Soil Classification should the soils be disposed of offsite. An evaluation of the contamination status of the site shall be undertaken based on the soil sample concentrations for contaminants of concern.

Identify the inputs into the decision: The following inputs were considered as part of the DQO process.

a) Advancement of thirteen (13) borehole test locations, advanced to natural soils.
b) Site walkover survey and site features noted.
c) Laboratory results and action level for each contaminant of concern analysed.
d) Confirmation that the dataset generated by sample analysis is of an acceptable quality to allow for reliable comparison to adopted assessment criteria by assessment of quality assurance and control (Qa/Qc) as per data quality indicators established in **specify tolerable limits on decision errors** section.

Soil sampling depths considered adequate to assess the vertical profile of the soils were retrieved. Quality Assurance and Quality Control procedures implemented will be in accordance with those stated in NEPM ASC 1999 (as amended in 2013) Schedule B3 Guideline on Laboratory Analysis of Potentially Contaminated Soils.

Define the boundaries of the study area: The investigation area is located at the proposed warehouse, Lot 7, Sky Road, Melbourne Airport, Victoria 3045, refer to Figure 1 of Appendix A.

The maximum vertical extent of the site investigation was 0.4mbgl, being the deepest soil sample analysed. The lateral extents of the intrusive investigation are considered to be within the confines of the boreholes drilled.

Due to the project objectives, seasonality was not assessed as part of this investigation. Data was therefore representative of the timing and duration of the current investigation.

Develop a decision rule: Evaluation of the analytical laboratory results for soil samples retrieved shall be screened against the adopted Airports (Environment Protection) Regulations 1997 Soil Pollution - Accepted Limits criteria and criteria considered protective of environmental values of land, Melbourne Airport PFAS Management Framework (March 2022) criteria and EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds* criteria.

The decision rules adopted to answer the decisions identified in **identify the decision** section are summarised in the table below.

Decision(s) Required to be Made	Decision Rule
Are there any significant contamination risks identified at the Site with respect to the proposed development of the Site?	Analytical data for representative soil samples of identified soil media of potential concern were compared against adopted Regulation and Melbourne Airport PFAS Framework criteria thresholds. If one or more concentrations of contaminants at one or more sampling locations were reported above the adopted Regulation and Melbourne Airport PFAS Framework criteria, the answer is Yes subject to consideration below. If concentrations of contaminants were reported below the adopted Regulation and Melbourne Airport PFAS Framework criteria, the answer is No.

Decision(s) Required to be Made	Decision Rule
	Use of statistical methods: For the characterisation of sample sets, statistical analysis of the data can be undertaken as appropriate and in accordance with relevant guidance documents, to facilitate the decisions. The following statistical criteria was adopted with respect to soils: Either the reported contaminant concentrations were all below the Site criteria, or the average Site concentration for each analyte was below the adopted Site criterion, no single analyte concentration exceeded 250% of the adopted Site criterion, and the standard deviation of the results was less than 50% of the Site criterion. If the resulting 95% upper confidence limit (UCL) of the average concentration for each analyte was below the adopted Site criterion, the answer to the decision is No. If the statistical criteria were not satisfied, the answer to the decision is Yes.
Determine the EPA Victoria Waste Classification of the insitu soils.	Compare concentrations of contaminants with Table 2 and 3 criteria of EPA Victoria Publication 1828.2.
Is there any evidence of, or potential for, migration of contaminants off-site?	A qualitative assessment of contaminant sources, migration pathways and receptors was completed during this assessment of available investigation data. Where the assessment identified the potential for unacceptable risk to off-site receptors as a result of Site contamination conditions, the answer to the decision is Yes. Otherwise, the answer to the decision is No.

Table 3: Summary of Decision Rules

Specify tolerable limits on decision errors: This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted from the Victorian EPA Guidelines and NEPM ASC (2013) and modified to meet the project objectives.

Given the nature of the assessment, quality control samples were limited.

To assess the usability of the data prior to making decisions, the data will be assessed against predetermined Data Quality Indicators (DQIs). The pre-determined DQIs established for the project are discussed below in relation to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters), and are shown in the Table below.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one dataset can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Data Quality Indicator	Frequency	Data Quality Criteria
Precision		
Blind duplicates (intra laboratory) (soil only for PAHs)	2 sample(s) for soil only	<50% Relative Percent Difference
Blind duplicates (inter laboratory) (soil only for PAHs)	2 sample(s) for soil only	<50% Relative Percent Difference
Laboratory duplicates (soil only)	1 / 20 samples	<50% Relative Percent Difference
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		

Data Quality Indicator	Frequency	Data Quality Criteria
Sampling appropriate for media and analytes	-	-
Samples extracted and analysed within holding times.	-	Soil organics (7-14 days), inorganics (6 months) Water TPH/PAHs 7 days to extraction, VOCs/ vTPH – 14 days, 6 months for metals Carbon tubes (28 days)
Laboratory blank	1 per sampling batch	<LOR
Rinsate blank (Heavy metals – sampled from reusable sampling equipment)	N/A	<LOR
Comparability		
Standard operating procedures for sample collection and handling	All samples	All samples
Standard analytical methods used for all analyses	All samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All samples	All samples
Limits of reporting appropriate and consistent	All samples	All samples
Completeness		
Sample description and chain of custody completed and appropriate	All samples	All samples
Appropriate documentation	All samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All Samples	LOR<= Site assessment criteria

Table 4: Summary of Quality Assurance and Quality Control Programme

If any of the DQIs are not met, further assessment will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data. Corrective actions may include requesting further information from samplers and / or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

Optimise the design for obtaining data: Additional sampling shall be undertaken where data gaps exist or where it is deemed necessary, i.e. contamination encountered or known high potential for contamination areas could not be sampled etc., in order to adequately characterise the environmental site conditions. Targeted sampling to be focused on potential areas of contamination on the site. Resource effective design that is expected to achieve stated DQOs. Quality Assurance (QA) procedures to be

followed in line with NEPM ASC 1999 (as amended in 2013) Schedule B3 Guideline on Laboratory Analysis of Potentially Contaminated Soils, with appropriate Quality Control (QC) samples retrieved.

Adopted Assessment Criteria

Airport Regulations: The Airports (Environment Protection) Regulations 1997 (the Regulation) outline requirements for assessment of soil pollution within airports. Table 1 of Schedule 3 of the Regulations provides accepted limits of soil pollution for general areas of an airport, however, criteria for PFAS are not provided.

Per and Poly-Fluoroalkyl Substances (PFAS) Contamination: The Regulations do not include criteria for PFAS, therefore, the PFAS National Environmental Management Plan (PFAS NEMP 2.0) (HEPA, 2020), hence known as the Plan, has been used as guidance for the assessment and management of PFAS contamination in soil and water. The Plan was developed at the request of Environment Ministers around Australia, the Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE) have collaborated to develop this Plan. The Plan is designed to achieve a clear, effective coherent and nationally consistent approach to the environmental regulation of PFAS.

The table below presents the screening levels derived for the protection of human health and the environment. The HISL and EISL for industrial/commercial use have been adopted for this assessment.

Exposure Scenario	PFOS / PFHxS	PFOA
Human Health – Residential with garden / accessible soil	0.01 mg/kg	0.1 mg/kg
Human Health – Residential with minimal opportunities for soil access	2 mg/kg	20 mg/kg
Human Health – Public open space	1 mg/kg	10 mg/kg
Human Health – Industrial / commercial	20 mg/kg	50 mg/kg
Interim soil – ecological direct exposure (All land uses)	1 mg/kg	10 mg/kg
Interim soil – ecological indirect exposure (All land uses)	0.01 mg/kg	-
Interim soil – ecological indirect exposure (Used for intensely developed sites with no secondary consumers and minimal potential for indirect exposure such as Industrial land use)	0.14 mg/kg	-

Table 5: Human Health and Ecological Screening Levels for PFAS Contamination in Soils (Extracted from Tables 2 and 3, HEPA 2020)

EPA Victoria has not yet adopted the PFAS NEMP 2.0 (HEPA 2020). EPA Victoria currently supports and has adopted the PFAS NEMP 1.0 (HEPA 2018). EPA Victoria takes a precautionary approach to PFAS as they are persistent, accumulative and mobile. The EPA Victoria Publication 1828.2 does not include criteria for PFAS. EPA Designation - *Classification of PFAS-impacted soil* (State Government of Victoria, 2022) criteria indicates that waste soil impacted by per-and poly-fluorinated alkyl substances (PFAS) which contains less than upper limit PFAS contaminant concentrations (as listed below) and otherwise complies with the requirements specified in the designation as fill material and is not priority waste can be classified as Fill Material. The above criteria are not applicable to Commonwealth land.

- PFOS <0.002 mg/kg
- PFHxS <0.001 mg/kg
- PFOA <0.001 mg/kg

Melbourne Airport Reuse Management Levels and Requirements: Melbourne Airport has provided a PFAS Management Framework which has been designed to deliver consistent environmental management practices for potential environmental risks that are posed by PFAS impacted material on construction and maintenance projects at Melbourne Airport.

Table 2 (*Table below*) of Section 3.6 of the document provides a framework for the on-site reuse of PFAS impacted soils, including PFAS concentration levels and minimum management requirements for each level. When excavating material onsite soil management options for reuse and disposal are provided. The reuse of material onsite must meet the requirements outlined in Section 3.4. Where no immediate reuse option is available or is not appropriate, soil and crushed rock/aggregate can be stored within the Gate 11 Facility until a reuse option becomes available and must also meet the requirements outlined in Section 3.5. Storage within the facility is subject to approval from the APAM Environment and Sustainability Team. Any deviation from these requirements is subject to further risk assessment and approval from the APAM Environment Team before proceeding.

Management Level	PFOS + PFHxS Concentration		Reuse Management Requirement	Storage at WTP Gate 11 Facility
	Total (mg/kg)	ASLP Concentration – Neutral pH (µg/L)		
Level 1	≤0.01	≤0.4	Reuse within same concentration areas with surface stabilisation improvements (e.g. hydromulch). If material is topsoil and has ASLP concentrations <0.07 µg/L, can be reused within same concentration areas without surface stabilisation	Stabilisation to minimise dust generation and surface water runoff using hydromulch or similar stabilisation product.

Management Level	PFOS + PFHxS Concentration		Reuse Management Requirement	Storage at WTP Gate 11 Facility
	Total (mg/kg)	ASLP Concentration – Neutral pH (µg/L)		
Level 2	>0.1 - 0.014	>0.4 - 0.7	Reuse within same concentration areas with surface stabilisation i.e. >50 mm clean fill / topsoil / Level 1 materials	Stabilisation to minimise dust generation and surface water runoff using hydromulch or similar stabilisation product.
Level 3	>0.014 - <0.14	>0.7 - 7	Reuse subject to specific risk assessment in accordance with the PFAS NEMP, followed by APAM approval	Temporary and final stockpiles covered with impermeable barrier to prevent infiltration to, and leaching from, stockpile (e.g. LDPE with maintenance; or impermeable geocomposite; or similar material)
Level 4	>0.14– 50*	>7– 2,500	Reuse subject to specific risk assessment in accordance with the PFAS NEMP, followed by APAM approval	Storage subject to specific risk assessment to confirm required controls followed by APAM approval
Level 5	>50	>2,500	Cannot be reused on-site. May require treatment prior to reuse, storage or disposal. May be able to be retained on-site under specific management circumstances subject to risk assessment, engineering controls and APAM approval.	Storage not permitted without further risk assessment and APAM approval. May require treatment prior to reuse, storage or disposal.

Table 6: Reuse management levels and requirements (Extracted from Table 2, APAM Melbourne Airport PFAS Management Framework March 2022)

Adopted Waste Disposal Criteria for Soils: In Victoria, waste must be classified to meet waste duties under Part 6.4 (*Duties relating to industrial waste*) and 6.5 (*Duties and controls relating to priority waste*) of the Environment Protection Act 2017. The Environment Protection Regulations (*the Regulations*), Part 4.2 (*Industrial Waste and priority waste*) specifies the process for classifying waste. This new framework is intended to ensure that all waste generators, transporters, and waste managers are proactive in their management of risks to human health and the environment, to comply with the new General Environmental Duty (GED) and to support and encourage waste resource recovery and reuse.

In addition to the GED, new duties are attached to each classification of waste. Waste generators or managers must classify industrial wastes that they manage, including waste soils originating from contaminated land, as Industrial Waste, Priority Waste or Reportable Priority Waste. Waste codes are set out in Schedule 5 of the Regulations, where different types of waste are pre-classified or classification is based on a mirror code, where it is identified that the waste may be hazardous or not hazardous dependent on the circumstances, requiring further classification.

Each waste type has Duties and Controls that apply to that type of waste, these are outlined in the table below. These duties and any associated controls will accumulate, this means that each tier of waste must be managed with regard to the duties and controls of the tiers below it.

Waste Type	Description	Duties Under the Act
Industrial Waste	Operators who generate industrial waste must take reasonable steps to ensure that wastes are not illegally dumped and are instead taken to a lawful place where the receivers have authorisation to receive it.	Duties of persons depositing Industrial Waste Duties of persons receiving Industrial Waste Duty of persons involved in transporting Industrial Waste
Priority Waste	The concept of Priority Waste introduces tailored controls for specific wastes that have the potential to be recycled, reused or yield recovered resources. Persons managing priority wastes will be required to take all reasonable steps to consider alternatives to disposal.	*Plus:* Duties of persons managing Priority Waste (This includes a duty to investigate alternatives to waste disposal)
Reportable Priority Waste	Reportable priority waste is a subset of priority waste that holds the highest levels of risk and has more stringent controls on its management. The new regulations state that the EPA must be notified of the following transactions: - Consignment for transport of reportable priority waste - Transport of reportable priority waste - Receipt of reportable priority waste at a place or premises	*Plus:* Duty to notify of transaction in Reportable Priority Waste Duties of persons transporting Reportable Priority Waste

Table 7: Waste Types and Corresponding Duties Under the Act - Extract from EPA Victoria Publication 1756 Summary of Waste Framework

The EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds*, is incorporated into the Regulations without modification. This publication establishes the characteristics and thresholds necessary for complying with the Regulations, specifically, classification of wastes to determine the relevant waste disposal category in accordance with Schedule 6 of the Regulations.

A holder of waste must use the criteria and thresholds in this publication to determine a waste disposal category unless the category is determined by the Regulations. A classification of priority waste must be consistent with any designation issued by the Authority for that type of priority waste.

Soils requiring offsite disposal should be sampled at the sampling rates recommended in the EPA Victoria Publication 702 *Soil Sampling* and categorised in accordance with criteria listed in EPA Victoria Publication 1828.2.

Waste soil proposed to be removed offsite shall conform to one of the following categories stated in the table below.

Waste Soil Classification	EPA Victoria Requirements for Waste Soil Classification and Disposal Offsite	Management Options
Fill Material	Fill material is soil with extremely low levels of contamination. Fill material is considered safe to use without containment. Fill material is Industrial Waste, but not priority waste. Fill Material has contaminant concentrations below levels in Table 3 of Waste disposal categories – characteristics and thresholds (EPA Victoria Publication 1828). The soil must be analysed for all contaminants known and reasonably expected to be present in the soils.	- Fill Material must be sent to a lawful place. - Fill Material soils are generally suitable for reuse subject to a Declaration of Use. - Fill Material can be reused and contained onsite. - A permission to transport Fill Material is not required. It also does not need to be tracked. - The general environmental duty (GED) must be met to minimise risks of harm to human health and the environment.
Waste Acid Sulfate Soils	Potential and actual acid sulfate soils are classified as waste acid sulfate soil (WASS) when they don't contain: - contaminant concentrations exceeding the upper limits for Fill Material in Table 3 of Waste disposal categories – characteristics and thresholds (EPA Victoria Publication 1828) - Asbestos. If soil has contaminant concentrations exceeding the upper limits for Fill Material or contains asbestos, it's not classified as WASS. The soils will then be classified as Category A, B, C waste, Category D soil or soil containing asbestos only.	When disposing of WASS offsite it must be sent to a lawful place: - If WASS is being sent for treatment or amelioration for reuse or offsite disposal, the receiving site needs an L08 registration. - Treating or ameliorating refers to neutralising acidification or potential acidification of soil. - If WASS is proposed to be sent to landfill, including for amelioration, you must send it to a landfill authorised to receive WASS. - If WASS is proposed to be strategically reburied it, the receiving site needs an A18 discharge to aquifer permit.
Soil Containing Asbestos Only	This Priority Waste Category only applies to soil that: - contains asbestos - doesn't have contaminant concentrations greater than the upper limit for fill material in Table 3 of Waste disposal categories – characteristics and thresholds (EPA Victoria Publication 1828). If the contaminant concentrations are higher, the soil is classified as Category A, B, C or D. If the contaminant concentrations are lower but the soil contains asbestos, it is soil containing asbestos only. Should reasonable practicable steps be taken to remove visible asbestos-containing material from soil, it's not considered soil containing asbestos only. In this case it might be recategorized as Fill Material.	Soil containing asbestos only is reportable priority waste. It must go to a place authorised to accept it, known as a lawful place. Soil containing asbestos only can be: - contained onsite - sent to a landfill authorised to accept soil with asbestos. This type of soil can be contained onsite in volumes under 1000m^3. The general environmental duty (GED) must be met to minimise risks of harm to human health and the environment. Containment of volumes greater than 1000m^3 onsite can be achieved with an L02 licence. A Site Management Order may be placed on the land title for ongoing management.
Category D Contaminated Soils	Category D is a priority waste category applying only to soil. Category D covers the least hazardous soils. Category D soil has contaminants: - greater than the upper limit for fill material on Table 3 of Waste disposal categories – characteristics and thresholds (EPA Victoria Publication 1828). - below the upper limit for Category D on Table 2 of the same publication. Category D soil is a reportable priority waste. It must go to a lawful place authorised to accept it.	Category D can be: - contained or reused onsite or on a project site. - treated to lower its contaminants so it becomes Fill Material. - sent to a landfill authorised to accept Category B, C or D soils. Category D soils can be contained onsite in volumes under 1000m^3. The general environmental duty (GED) must be met to minimise risks of harm to human health and the environment. Category D soils can be reused by containing them on a project site under an A17 permit. E.g. Category D soils can be reused in engineered railway and freeway embankments, or under roads and footpaths. Containment of volumes greater than 1000m3 onsite can be achieved with an L02 licence. A Site Management Order may be placed on the land title for ongoing management.
Category C Contaminated Soils	Category C soil is a priority waste category that has contaminants: - greater than the upper limit for Category D in Table 2 of Waste disposal categories - characteristics and thresholds (EPA Victoria Publication 1828). - below the upper limit for Category C in Table 2.	Category C soil can be: - contained onsite. - sent to a landfill authorised to accept Category B or C soil. - taken offsite to a lawful place and treated to reduce the level of contaminants. Treated waste may be reclassified as less hazardous Category D soil. The soils

Waste Soil Classification	EPA Victoria Requirements for Waste Soil Classification and Disposal Offsite	Management Options
		could then be managed under that category.
Category B Contaminated Soils	Category B soil is a priority waste category that has contaminants: - greater than the upper limit for Category C in Table 2 of Waste disposal categories - characteristics and thresholds (EPA Victoria Publication 1828). - below the upper limit for Category B in Table 2.	Category B soil can be: - contained onsite. - sent to a landfill authorised to accept it and taken offsite to a lawful place. - treated to reduce the level of contaminants. - treated waste may be reclassified as less hazardous Category C or D soil.
Category A Contaminated Soils	Category A soil is a priority waste category that has contaminants: - greater than the upper limit for Category B in Table 2 of Waste disposal categories - characteristics and thresholds (EPA Victoria Publication 1828).	Category A is the most hazardous type of waste. - Category A waste cannot be sent to landfill. - Category A waste including soil can be taken offsite to a lawful place and treated to reduce contaminants. - treated waste may be reclassified as less hazardous Category B, C or D waste. The soils can then be managed under that category.

Table 8: Summary of Requirements for Waste Soil Classification and Disposal Offsite and Available Management Options

Assuming the chemical contamination levels of the soils are below the fill material criteria, industrial wastes including, but not limited to, concrete, bricks, asphalt, PVC pipes, plastics, metals, wood etc. must be removed as far as reasonably practicable as per EPA Determination - *Specifications acceptable to the Authority for receiving fill material* (Victorian Government Gazette No. S301 on 18 June 2021).

Quality Assurance and Quality Control

Quality Control Procedures: A.S.James implemented a comprehensive Quality Assurance and Quality Control (QA/QC) programme as part of field soil sampling procedures, and conformed to the following guidelines and standards where it is deemed necessary:

- NSW EPA Sampling Design Part 1 – Application - Contaminated Land Guidelines (2022)
- NSW EPA Sampling Design Part 2 – Interpretation - Contaminated Land Guidelines (2022)
- National Environment Protection Council (NEPC), 2013, The National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) as amended 2013.
- Industrial Waste Resource Guidelines (IWRG) Sampling and Analysis of Waters, Wastewaters, Soils and Wastes, Victorian EPA Publication IWRG 701, June 2009.
- Site Characterisation Considerations, Sampling Precautions and Laboratory Analytical Methods for Per- and Polyfluoroalkyl Substances (PFAS), April 2020.
- Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), January 2017.

The implemented QA/QC programme included the following documentation and procedures:

- The presence of an appropriately qualified and trained Environmental Engineer (Contaminated Land) to conduct the site assessment.

- The use of clear, concise and standardised field logs to record and document findings during the site assessment.
- Ensure the appropriate preservation of samples during transport from the field to the laboratory.
- Decontamination of equipment prior to sampling, and between each sampling event. This was achieved through the use of deionised water and Decon 90. The equipment was thoroughly cleaned through rigorous scrubbing to avoid cross-contamination between sampling events.
- Use of completed Chain of Custody (CoC) document, filled out at end of sampling activity or end of day, to ensure the traceability of sample transport and handling.
- Samples were sent to laboratories accredited by the National Association of Testing Authorities (NATA), ALS Environmental Division (Primary Laboratory) – Eurofins (Secondary Laboratory), for the analysis of retrieved soil samples.
- Collection and analysis of field quality control samples, inclusive of Trip Blanks (where appropriate), Primary Duplicates and Secondary Duplicates.
- Use of laboratory provided glass sample jars with Teflon lined screw-on caps and PFAS specific plastic sample jars. Any water samples were placed into laboratory supplied glass or plastic bottles/jars with Teflon lined screw-on caps, water samples analysed for PFAS were sampled in plastic PFAS specific bottles.
- Compliance with laboratory holdings times.
- Comparison of field and analytical data to analyse for any irregularities or anomalies contained within the results.

Quality Assurance and Quality Control Data Quality Objectives: A.S.James adopted the following data quality objectives and analysis of the QA/QC data in accordance with National Environment Protection Council (NEPC), 2013, Schedule B3 Guideline on Laboratory Analysis of Potentially Contaminated Soils. This consisted of analysing the following components of the analytical results.

- Primary duplicate and secondary duplicate samples were analysed against the results reported for the primary sample. This is achieved through the use of the relative percent difference (RPD) calculations, with an acceptable limit of +/- 30%.
- Review of laboratory spike sample results, with acceptable limits of 70-130% for organics and 85-115% for metals.
- Review of laboratory duplicate sample results, with acceptable limits of +/- 30%.
- Review of laboratory blank sample results, expected to be below detection limit.

To ensure consistency, the following methodology was employed when one or both of the parent / primary duplicate or parent / secondary duplicate pairs had results below limit of reporting (LOR). In the case of one duplicate pair reporting below LOR, the calculated RPD values adopted the value of the relevant laboratory

reporting limit to enable calculation of the RPDs. Should both results report below LOR, the results were considered acceptable for the purpose of the investigation.

Soil Quality Control Samples: Quality control samples are retrieved and analysed to ensure the validity and usability of the data set collected, and will ensure that only representative and reliable data meeting the specified requirements is considered in the assessment.

Field Quality Control Programme: The quality control samples analysed and the implemented analysis schedule is provided in the table below.

Sample ID	Sample Type	Primary Sample No.	Laboratory	Analytes Tested
Soil Samples				
Blind A	Primary Duplicate	BH5-0.1	ALS Environmental	Polyaromatic Hydrocarbons
Dup-BH5-0.1	Secondary Duplicate	BH5-0.1	Eurofins	
Blind B	Primary Duplicate	BH1-0.1	ALS Environmental	
Dup-BH1-0.1	Secondary Duplicate	BH1-0.1	Eurofins	

Table 9: Quality Control Samples Retrieved and Analysed

Sampling Frequency: The recommended minimum sampling frequency of 10% blanks, or 1 in 20 sample ratio was achieved, and considered appropriate for this assessment. This consisted of the recovery of a Primary Duplicate and Secondary Duplicate sample at locations where contamination was most likely to be encountered, i.e. within historic fill layers present. This provides a more representative quantitative assessment of calculated RPDs.

Quality Assurance and Quality Control Sample RPD Results: As stated previously, the quality of the primary laboratory (ALS Environmental) data generated was assessed with appropriate laboratory Quality Control samples and using standard methods. The Quality Control samples used by the laboratory included internal spikes, duplicates and method blanks, these were analysed as part of the Quality Assurance programme.

The overall assessment of the implemented A.S.James Quality Assurance programme for the soil analyses has been made in terms of completeness. The completeness is equal to the percentage of valid Quality Assurance and Quality Control results. The Quality Assurance and Quality Control results for soil that meets the acceptance criteria include the following:

- Relative Percentage Differences (RPDs) +/- 30%.
- Spikes falling within range of 70-130% for organics and 85-115% for metals.

- Duplicates within range of +/- 30% for both metals and organics.
- Laboratory equipment blanks expected to be below detection limit.

A summary of the primary duplicate and secondary duplicate results is provided in Appendix E. A summary of the Quality Control data collected and reported along with a calculation of completeness is provided in the table below.

Sample Type	Total No. of Results	No. of Results not Meeting Data Quality Objectives	Percentage of Results Meeting Data Quality Objectives
Laboratory Duplicates	348	1	**99.71**
Laboratory Spikes	333	13	**96.10**
Method Blanks	307	0	**100.00**
Primary Duplicates	34	0	**100.00**
Secondary Duplicates	34	0	**100.00**
Overall Completeness	**1056**	**14**	**98.67**

Table 10: Summary of Quality Assurance Completeness

Analytical Laboratory Results

Laboratory Results: The results of the analytical tests of the in-situ soils are given in the attached ALS (Environmental Division) reports with reference 125298, refer to Appendix C. Refer to Appendix D for tabulated results screened against adopted criteria for all contaminants tested.

No exceedances of the adopted Airports (*Environment Protection*) Regulations 1997 Soil Pollution - Accepted Limits criteria, APAM PFAS Management Framework criteria nor the EPA Designation - *Classification of PFAS-impacted soil* (State Government of Victoria, 2022) criteria were reported. No exceedances of the adopted EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds* Table 3 soil criteria were reported.

EPA Victoria Waste Soil Classification Assessment

Domain 1 - Natural Silt

The laboratory analysis of soil samples retrieved from the in-situ Domain 1 soil reported no exceedances of the upper limits for Fill Material as per Table 3 of EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds*.

No exceedances of the adopted EPA Designation - Classification of PFAS-impacted soil criteria were reported.

The Domain 1 soil can be classified as Fill Material (Industrial Waste -Waste Code N122).

Domain 2 - Natural Clay

The laboratory analysis of soil samples retrieved from the in-situ Domain 2 soil reported no exceedances of the upper limits for Fill Material as per Table 3 of EPA Victoria Publication 1828.2 *Waste disposal categories – characteristics and thresholds.*

No exceedances of the adopted EPA Designation - Classification of PFAS-impacted soil criteria were reported.

The Domain 2 soil can be classified as Fill Material (Industrial Waste -Waste Code N122).

Airports (Environment Protection) Regulations 1997

Domain 1 – Natural Silt

Reported analytical results were screened against the adopted Airports (Environment Protection) Regulations 1997 Soil Pollution - Accepted Limits criteria, with no exceedances of the adopted criteria reported.

Domain 2 - Natural Clay

Reported analytical results were screened against the adopted Airports (Environment Protection) Regulations 1997 Soil Pollution - Accepted Limits criteria, with no exceedances of the adopted criteria reported.

APAM Melbourne Airport PFAS Management Framework

Domain 1 – Natural Silt

The reported results indicate the Domain 1 soils are classified as Level 1 material. The material can be reused in accordance with Section 3.4 of the PFAS Management Framework document or stored at Gate 11 facility.

Domain 2 - Natural Clay

The reported results indicate the Domain 2 soils are classified as Level 1 material. The material can be reused in accordance with Section 3.4 of the PFAS Management Framework document or stored at Gate 11 facility.

PFAS National Environmental Management Plan (January 2020)

Domain 1 - Natural Silt

No exceedances of the adopted criteria were reported. All reported Sum of PFOS + PFHxS, PFOS and PFOA concentrations were less than the Interim Soil Ecological Indirect and Direct Exposure criteria and Human Health Screening Value for Soil criteria.

Domain 2 - Natural Clay

No exceedances of the adopted criteria were reported. All reported Sum of PFOS + PFHxS, PFOS and PFOA concentrations were less than the Interim Soil Ecological Indirect and Direct Exposure criteria and Human Health Screening Value for Soil criteria.

Recommendations and Further Works Required

1) ASLP leachability analysis may require to be undertaken on soil samples reporting exceedance of limit of reporting prior to site disturbance, depending on the stance taken by the APAM environmental team.
2) With regards to waste soil classification for offsite disposal of surplus site soils, the sampling density requirement as per EPA Victoria Publication IWRG702-2009 *Soil Sampling* will have to be met via further intrusive investigation depending on the volume of surplus soils.
3) The southern area of the site as outlined in Figure 1 of Appendix A has been excluded from this investigation because of access issues due to site occupation for construction activities by others (Boreholes 15, 17, 18, 19 and 20) in south of the site and waterlogged conditions at Boreholes 12 and 16, due to construction site dewatering activities. It is recommended that intrusive investigation be undertaken in these areas at a later date.

Asbestos

No potential asbestos containing material was observed by the ASJ environmental engineer on the surface soils nor within any of the boreholes drilled. However, should any asbestos be identified during site activities in significant amounts an Occupational Hygienist or Scientist who specialises in asbestos contamination will need to be appointed to make recommendations as to the existing site.

Limitations of Environmental Site Assessment

This report has been prepared for use by the client (*Australia Pacific Airports (Melbourne) Pty Ltd*) who has commissioned the works in accordance with the project brief only and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

A.S.James accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by A.S.James, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, A.S.James reserves the right to review the report in the context of the additional information.



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Appendix A

Location of Boreholes and Bore Logs



A.S. James Pty Ltd
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 6 Oct 2023**

LEGEND

- Denotes approximate area of proposed site boundary
- Denotes approximate borehole location
- Denotes area of site that has been fenced off by others - no access
- Denotes area of site that was waterlogged due to site dewatering - no access

A.S James does not warrant the accuracy or completeness of the information displayed within this figure and any person using it does so at thier own risk. A.S James shall bear no responsibility or liability of any errors , faults, defects or omissions in information. The above is for indicative purposes only & is not to scale.

Borehole Locations - Proposed Warehouse,
Lot 7, Sky Road, Melbourne Airport, Victoria 3045

Drawn: [redacted]
Checked: [redacted]

Source: Nearmap & Site Inspection

Figure 1

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 1
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH1-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		Blind B and Duplicate Retrieved
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH1-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 2**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 2
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	**0.00**		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH2-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	**0.20**		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH2-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	**0.60**		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 3**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 3
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	**0.00**		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH3-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	**0.20**		
Clay (CH)	Grey			
	Silty			
	Moist		*	Soil Sample No: BH3-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	**0.60**		

+ Standard Penetration Test - N blows/150mm. incr.
I Undisturbed Sample - Diameter Stated
s Vane Shear Strength
p Pocket Penetrometer Resistance

c Apparent Cohesion
Ø Friction Angle
P Wet Density
w Moisture Content

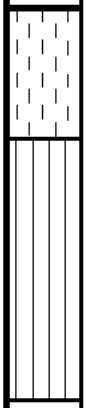
L.L. Liquid Limit
P.L. Plastic Limit
P.I. Plasticity Index
L.S. Linear Shrinkage

Figure 4

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 4
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	**0.00**		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH4-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	**0.20**		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH4-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	**0.60**		



+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 5**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 5
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH5-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		Blind A and Duplicate Retrieved
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH5-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.
I Undisturbed Sample - Diameter Stated
s Vane Shear Strength
p Pocket Penetrometer Resistance

c Apparent Cohesion
Ø Friction Angle
P Wet Density
w Moisture Content

L.L. Liquid Limit
P.L. Plastic Limit
P.I. Plasticity Index
L.S. Linear Shrinkage

Figure 6

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Location: Lot 7, Sky Road, Melbourne Airport
Borehole 6
Job No. 122487 E1
Date: Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH6-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH6-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 7**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 7
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH7-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Grey			
	Silty			
	Moist		*	Soil Sample No: BH7-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 8**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 8
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH8-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH8-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.
I Undisturbed Sample - Diameter Stated
s Vane Shear Strength
p Pocket Penetrometer Resistance

c Apparent Cohesion
Ø Friction Angle
P Wet Density
w Moisture Content

L.L. Liquid Limit
P.L. Plastic Limit
P.I. Plasticity Index
L.S. Linear Shrinkage

Figure 9

A.S.JAMES PTY. LTD.
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Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 9
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH9-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH9-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 10**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

A.S.JAMES PTY. LTD.
Geotechnical Engineers

Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 10
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH10-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH10-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.
I Undisturbed Sample - Diameter Stated
s Vane Shear Strength
p Pocket Penetrometer Resistance

c Apparent Cohesion
Ø Friction Angle
P Wet Density
w Moisture Content

L.L. Liquid Limit
P.L. Plastic Limit
P.I. Plasticity Index
L.S. Linear Shrinkage

Figure 11

A.S.JAMES PTY. LTD.
Geotechnical Engineers

Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 11
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH11-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH11-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 12**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

A.S.JAMES PTY. LTD.
Geotechnical Engineers

Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 13
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH13-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH13-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 13**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

A.S.JAMES PTY. LTD.
Geotechnical Engineers

Location: Lot 7, Sky Road, Melbourne Airport **Borehole** 14
Job No. 122487 E1 **Date:** Oct 2023
Ground Water: NIL

Soil Type	Description	Depth	Tests	Results
Silt (MH)	Brown	0.00		
	Clayey			
	Organics and Root Zone Present		*	Soil Sample No: BH14-0.1
	Moist			Contamination Ranking = 0/A PID = 0ppm
	No Hydrocarbon Odour or Staining	0.20		
Clay (CH)	Brown			
	Silty			
	Moist		*	Soil Sample No: BH14-0.4
	No Hydrocarbon Odour or Staining			Contamination Ranking = 0/A PID = 0ppm
	End of Environmental Borehole	0.60		

+ Standard Penetration Test - N blows/150mm. incr.	c Apparent Cohesion	L.L. Liquid Limit	**Figure 14**
I Undisturbed Sample - Diameter Stated	Ø Friction Angle	P.L. Plastic Limit	
s Vane Shear Strength	P Wet Density	P.I. Plasticity Index	
p Pocket Penetrometer Resistance	w Moisture Content	L.S. Linear Shrinkage	

Appendix B

Equipment Calibration Certificate(s)

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-105422**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6eV lamp			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		94ppm Isobutylene	NIST	ME846		94ppm Isobutylene

Calibrated by: **Herman Chau**

Calibration date: **21/08/2023**

Next calibration due: **17/02/2024**

Appendix C

Laboratory Certificates & Chain of Custody Information

Appendix D

Tabulated Results Screened against Adopted Criteria

Appendix E

Soil Sample Quality Assurance and Quality Control Check

Appendix F

Architectural Drawing(s)

Appendix G

Site Photograph(s)



Photograph Taken at Borehole 3 Facing West Towards Borehole 4

A.S. JAMES PTY LTD
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 9 Oct 2023**

LEGEND

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Site Feature Photographs

DRAWN: [redacted]
CHECKED: [redacted]
SOURCE: Site Inspection

A4

Figure 1



Photograph Taken at Borehole 3 Facing South Towards Borehole 11

A.S. JAMES PTY LTD
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 9 Oct 2023**

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Site Feature Photographs

DRAWN: [redacted]
CHECKED: [redacted]
SOURCE: Site Inspection

A4

Figure 2



Photograph Taken at Borehole 5 Facing East Towards Borehole 4

A.S. JAMES PTY LTD
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 9 Oct 2023**

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Site Feature Photographs

DRAWN: [redacted]
CHECKED: [redacted]
SOURCE: Site Inspection

A4

Figure 3



Photograph Taken at Borehole 14 Facing North Towards Borehole 9

A.S. JAMES PTY LTD
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 9 Oct 2023**

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Site Feature Photographs

DRAWN: [redacted]
CHECKED: [redacted]
SOURCE: Site Inspection

A4

Figure 4



Photograph Taken at Borehole 14 Facing East Towards Borehole 15

A.S. JAMES PTY LTD
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 9 Oct 2023**

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Site Feature Photographs

DRAWN: [redacted]
CHECKED: [redacted]
SOURCE: Site Inspection

A4

Figure 5



Photograph Taken at Borehole 20 Facing North Towards Borehole 16

A.S. JAMES PTY LTD
Geotechnical Engineers

Site Address: Proposed Warehouse,
Lot 7, Sky Road,
Melbourne Airport, Victoria 3045

Job No: 122487 E1 **Date: 9 Oct 2023**

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Site Feature Photographs

DRAWN: [redacted]
CHECKED: [redacted]
SOURCE: Site Inspection

A4

Figure 6

Appendix K: Eastern Extension Project: Baseline Assessment of Natural Temperate Grassland at 379 Bullarook Road, Weerite (Biosis 2026b)



[redacted]

Baseline Assessment of Natural Temperate Grassland at [redacted]

Draft Report

Prepared for Australia Pacific Airports (Melbourne) Pty Ltd

11 March 2026

Biosis offices

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Document control

Version	Internal reviewer	Date issued
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Final version 01	TBC	TBC

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- Australia Pacific Airports (Melbourne) Pty Ltd: [redacted].
- Landowner: [redacted].

Biosis staff involved in this project were:

- [redacted]
- [redacted]
- [redacted]

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Contents

Summary **4**

1 Introduction **8**

1.1 Background 8
1.2 Description of the offset site 8
1.3 Offset management objectives and targets 9
1.4 Purpose of baseline monitoring for the future Offset Management Plan 9
1.5 Baseline monitoring tasks and previous assessments 9

2 Results **12**

2.1 Vegetation condition 12
2.2 Weed management 12
2.3 Pest animal control 15
2.4 Ground cover biomass control 15
2.4.1 Inter-tussock space and organic litter 15
2.4.2 Golf ball method and maximum vegetation height 15

3 Discussion **17**

3.1 Vegetation condition 17
3.2 Weed management 17
3.3 Pest animal control 18
3.4 Ground cover biomass 19

4 Assessment of results against management targets **22**

5 Summary of recommendations **25**

6 References **26**

Appendices **27**

Appendix 1 Permanent transect and photo point locations **28**

Appendix 2 Flora species list **29**

Appendix 3 Transect photo points **33**

Appendix 4 Photo points **46**

Appendix 5 General photos **51**

Appendix 6 Methods **53**

Vegetation mapping and quality assessment 53
Transect establishment and monitoring 53
Location of transects 55
Golf ball method 55
Photo points 55
Surface disturbance by pest animals 56

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Inter-tussock space 56
Organic litter accumulation 56
General site inspection and walkover 56
Data management 57
Limitations and uncertainty 57

Appendix 7 Vegetation quality assessment results 58

Tables

Table 1 Weighted average VQA score for Natural Temperate Grassland within the offset site 12
Table 2 Baseline weed cover along permanent point intercept transects 13
Table 3 Baseline cover of high and low threat herbaceous weed species within the offset site 14
Table 4 Baseline frequency of herbivore and/or pest animal scat density along belt transects 15
Table 5 Summary of baseline biomass metrics along permanent point intercept transects 15
Table 6 Assessment of baseline results against management objectives and targets 22
Table 7 Summary of recommendations provided throughout the baseline monitoring report 25
Table 8 Locations of permanent point intercept transects within the offset site 28
Table 9 Locations of permanent photo points within the offset site. 28
Table 10 Categories for classifying scat density in the 1 x 1m quadrats 55

Figures

Figure 1 Location of the proposed EPBC Act offset for Natural Temperate Grassland [redacted] Victoria 10
Figure 2 Locations of monitoring transects and photo points 11
Figure 3 Locations of incidental noxious weed observations and pest animal disturbance made during vegetation assessments. 20
Figure 4 Locations of threatened flora made during vegetation assessments. 21

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Summary

Background

This report presents the baseline monitoring data for an offset site located at [redacted], Victoria. The offset site is referred to as the [redacted] throughout this report. The [redacted] offset site is to provide part of the environmental offsets required as compensation for residual impacts relating to [redacted].

The [redacted] is likely to have significant impacts on areas of *Natural Temperate Grassland of the Victoria Volcanic Plain* (Natural Temperate Grassland). Natural Temperate Grassland is a Matter of National Environmental Significance (MNES) and listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The [redacted] offset is proposed to be protected and managed in perpetuity as a third party offset site.

The quality of Natural Temperate Grassland within the [redacted] offset site was initially assessed by Biosis during a preliminary assessment in November 2024 (Biosis 2025) and its suitability confirmed for a potential offset site. This report presents the baseline Natural Temperate Grassland condition data captured in December 2025.

At the time of preparing this baseline assessment, an Offset Management Plan (OMP) has not yet been prepared for the offset site. Baseline conditions were captured so that progress towards management targets can be tracked once the OMP has been finalised. The purpose of baseline monitoring is to capture the starting condition of the offset site before major conservation management works commence. The management targets outlined in this report are based on the findings of the baseline data collection and current OMPs for similar offset sites. These management targets will be updated in future monitoring reports to reflect the OMP relevant to this site once it has been finalised.

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Results

The following table summarises the results from the baseline monitoring and assesses the present condition against the anticipated targets of the OMP.

Parameter	Target at end of 10 years of management (2036)	Baseline result	Target achieved
Natural Temperate Grassland habitat quality (VQA score)*	6/10	5/10 (VQA score of 46.93/100)	No
Total weed cover*	≤50% cover	96.5% (±SE 0.9)	No
High threat weed cover*	≤50% of total weed cover	Total high threat weed cover: 27.2% (±SE 5.6) As a proportion of total weed cover: 28.2%	Yes
Woody weed cover	Woody weeds eliminated (i.e. <1% cover) and no mature specimens present	African Box-thorn *Lycium ferocissimum* was recorded within the offset site, but not along monitoring transects. While the cover of this species is currently <1%, mature specimens are present and will need to be removed.	No
New and emerging weeds	<1% cover	List of weed species collected during the baseline and preliminary assessment is presented in Appendix 2. New and emerging weeds will be determined in subsequent monitoring years.	N/A for baseline assessment
Pest animals	Negligible (<1%) surface disturbance caused by pest animals	The cover of ground disturbance caused by pest animals was 0.2% across the offset site.	Yes
	No active rabbit warrens or fox dens	None observed during baseline assessment.	Yes
	New and emerging pest animals controlled	New and emerging pest animals will be determined in subsequent monitoring years.	N/A for baseline assessment
Ground cover biomass	Inter-tussock space target >20% and ≤40% cover^	46.3% (±SE 5.0)	Near
	Low biomass (golf ball score ≥15)^	High biomass (mean golf ball score = 4.6 ±SE 0.5)	No
	Organic litter target ≥5% and ≤15% cover^	48.8% (±SE 5.0)	No
Total herbaceous weed cover*	≤50% cover	96.5% (±SE 0.9)	No

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Parameter	Target at end of 10 years of management (2036)	Baseline result	Target achieved
Low threat herbaceous weeds*	≤50% cover	94.0% (±SE 1.2)	No
High threat broad-leaved weeds*	≤5% cover	5.5% (±SE 2.0)	Near
High threat perennial tussock weeds*	≤15% cover	18.3% (±SE 5.4)	Near
High threat perennial mat-forming grassy weeds*	<5% cover	4.3% (±SE 1.6)	Yes

Notes to table:
*Target to be confirmed once OMP has been finalised.
^These targets are not likely to be mandated in the final OMP but are suggested goals to achieve the overall site condition score target and to help inform management strategies.

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Recommendations

At a minimum, the historical cattle grazing regime (particularly the seasonal timing, intensity and duration) should be re-instated in an attempt to maintain the condition of the offset site, until refinement can be made as part of an OMP. The land manager indicated that the offset site was stocked with 64-134 head of cattle between 23 August and 7 September 2024, but not grazed by stock in 2025. The cessation of grazing in 2025 is likely to be a major reason for the decline in VQA scores across the offset site between 2024 and 2025. Re-introduction of grazing will assist in managing biomass and weed cover.

Based on the baseline assessment undertaken in December 2025, the following recommendations are provided for improving the condition of the offset site:

Recommendation	Details
1	To improve the condition of the vegetation: • Reduce the cover of weeds by intensifying weed control and other management strategies as appropriate (i.e. pulse grazing with sheep and ecological burning). • Reintroduce missing plant lifeforms including: – Large herbs – Large tufted graminoids • Increase the cover of the following lifeforms: – Small herbs – Medium herbs – Medium non-tufted graminoids • Reduce the cover of organic litter to benchmark levels (≥5% and ≤15% cover).
2	General recommendations for weed control include: • Develop a weed control plan that outlines the weed species, priorities and control strategies. • Prioritise the control of high threat weeds across the offset site and as identified in Figure 3. • Frequent monitoring should be incorporated into the weed control plan to ensure management is effective and to document any new and emerging weed species within the offset area. • Develop an ecological burn plan, to be implemented in conjunction with the weed control and revegetation plans. Regular burning should be implemented to trigger natural recruitment, increase native species cover and reduce weed invasion. • Focus weed control, including spot spraying, on the perimeter of the Natural Temperate Grassland patches. • Implement pulse grazing (using sheep, where possible) to reduce biomass and cover of weed species.
3	To protect flora from pest animal herbivory: • Undertake active management and monitoring to reduce pest animals within the offset site. • Monitor potential emerging pest species, including deer, and implement active management when required.
4	Implement an ecological burning program and pulse grazing (using sheep, where possible) so that: • Ground cover biomass levels are reduced. • Cover of organic litter is improved.

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1 Introduction

1.1 Background

Australia Pacific Airports (Melbourne) Pty Ltd (APAM) commissioned Biosis Pty Ltd (Biosis) to monitor the condition of *Natural Temperate Grassland of the Victorian Volcanic Plain* (Natural Temperate Grassland) at an offset site located at [redacted]. Given the site's proximity to [redacted], it is referred to as the [redacted]. The [redacted] offset is intended to provide part of the environmental offsets required for Melbourne Airport's [redacted] The [redacted] will have a significant impact on Natural Temperate Grassland, which is a Matter of National Environmental Significance (MNES) listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The offset site supports 76.35 hectares of Natural Temperate Grassland. The quality of Natural Temperate Grassland within the [redacted] offset site was initially assessed by Biosis during a preliminary assessment in November 2024 (Biosis 2025) and its suitability confirmed for a potential offset site.

This report presents the baseline ecological data captured in December 2025. At the time of preparing this baseline assessment, an Offset Management Plan (OMP) has not yet been prepared for the offset site. This report therefore assesses the collected data against the anticipated management targets of the OMP (once finalised).

1.2 Description of the offset site

The offset site is located within the Victorian Volcanic Plain (VVP) bioregion and supports the Ecological Vegetation Class *Heavier Soils* Plains Grassland (EVC 132_61) that was confirmed to meet the key diagnostic characteristics and condition thresholds for Natural Temperate Grassland (TSSC 2008) (Figure 1). Existing infrastructure adjacent to the offset site includes the residence of the landowner. [redacted] is located to the east of the offset site.

The offset site supports 76.35 hectares of Natural Temperate Grassland which is dominated by native grasses, including:

- Brown-back Wallaby-grass *Rytidosperma duttonianum*
- Common Wallaby-grass *Rytidosperma caespitosum*
- Common Tussock-grass *Poa labillardierei*
- Fine-head Spear-grass *Austrostipa oligostachya*
- Kangaroo Grass *Themeda triandra*
- Leafy Wallaby-grass *Rytidosperma bipartitum*
- Slender Wallaby-grass *Rytidosperma racemosum* var. *racemosum*

The offset site also supports two threatened flora species listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act) including (Figure 4):

- Pale Swamp Everlasting *Coronidium gunnianum*
- Pale-flower Crane's-bill *Geranium* sp. 3

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The most prevalent weeds within the offset site include Toowoomba Canary-grass *Phalaris aquatica*, Fescue *Vulpia* spp., Cape Weed *Arctotheca calendula*, Wimmera Rye-grass *Lolium rigidum*, Subterranean Clover *Trifolium subterraneum* and Onion Grass *Romulea rosea*.

1.3 Offset management objectives and targets

The overarching environmental outcome to be achieved through management of the offset site is the maintenance and/or improvement of the extent and condition of Natural Temperate Grassland within the offset site. At the time of writing, an OMP has not yet been prepared for the offset site. The objectives and targets outlined within this report are anticipated based on OMPs for similar Natural Temperate Grassland offset sites and will be updated in subsequent monitoring reports following the approval of an OMP.

1.4 Purpose of baseline monitoring for the future Offset Management Plan

Detailed baseline monitoring of the offset site involves measuring the starting condition of the offset site and documenting the management issues that are present, providing an indication of the starting condition of the offset site. After baseline monitoring, consistent, regular and repeatable monitoring is required to document improvements at the offset site, to track the success of the management efforts against the OMP targets and to inform ongoing adaptive management actions. The results of all monitoring (baseline and subsequent monitoring) must inform adaptive management of the offset site, so that management is responding to the latest site conditions.

Throughout this report, in-text recommendations are highlighted in text boxes as shown below.

Recommendations
All recommendations arising from baseline monitoring are highlighted in this fashion throughout this monitoring report.

1.5 Baseline monitoring tasks and previous assessments

The following surveys and assessments contributed to the baseline monitoring results presented in this report:

- Preliminary vegetation mapping and condition scoring (Biosis 2025). These surveys and assessments ascertained the extent of Natural Temperate Grassland available at the offset site and its overall condition as per the VQA method (DSE 2004).
- Vegetation mapping and condition scoring of an additional paddock in the south of the property (undertaken during the baseline monitoring).

The methods utilised during the above assessments and the current baseline monitoring tasks are outlined in Appendix 4.

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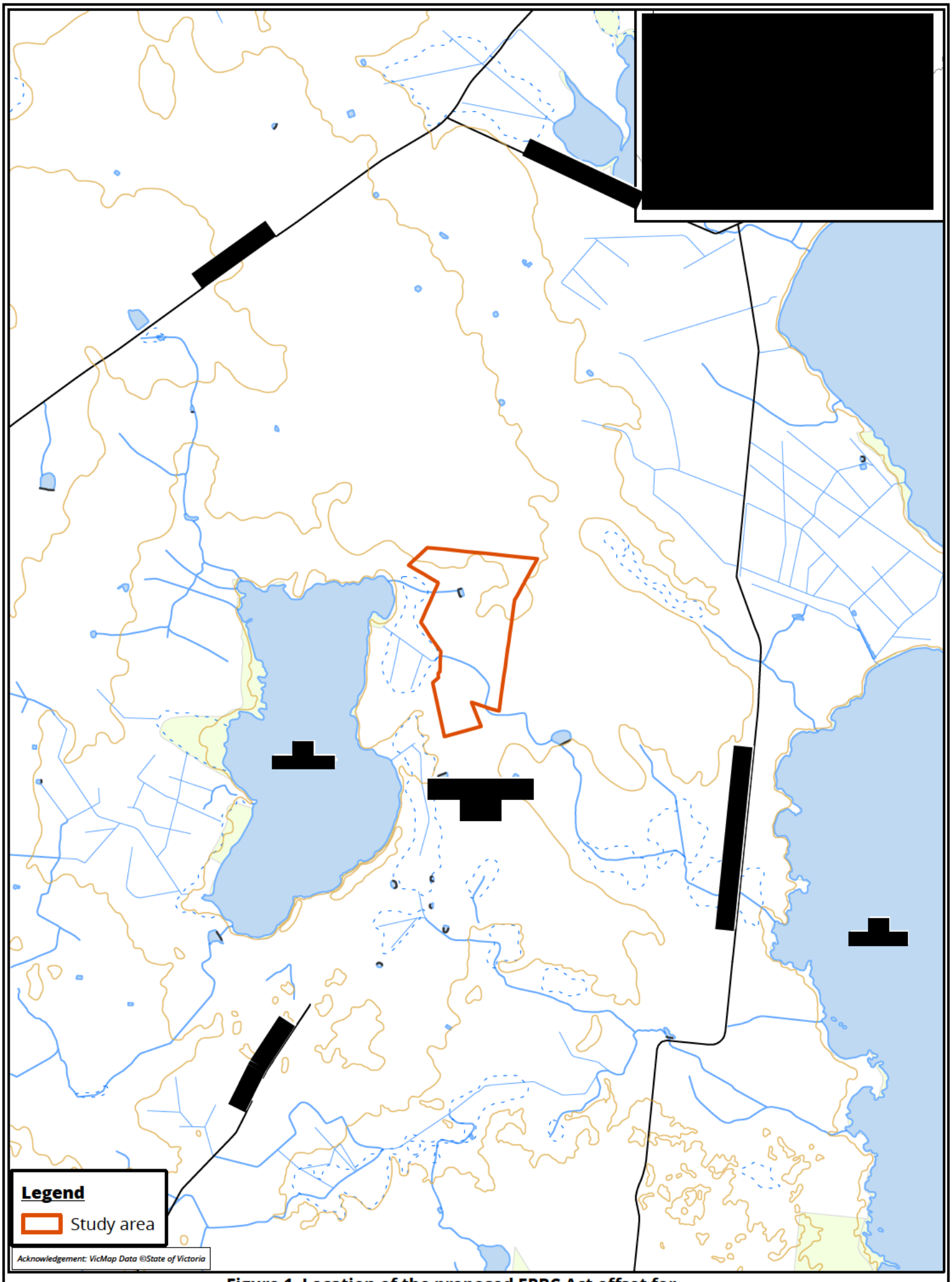


Figure 1 Location of the proposed EPBC Act offset for Natural Temperate Grassland ([redacted]), Victoria

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APEM Group

[redacted]



Legend

- Study area
- Contour 10m interval
- Monitoring transect
- Photo point

Nationally threatened Ecological Community (EPBC Act)

- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

Figure 2 Location of monitoring transects

0 50 100 150 200 250

Metres

Scale: 1:7,500 @ A3

Coordinate System: GDA2020 MGA Zone 54

N

biosis

APEM Group

2 Results

2.1 Vegetation condition

The weighted average VQA score of Natural Temperate Grassland at the [redacted] offset site was 46.93/100 in December 2025 during the baseline assessment. The baseline VQA score has decreased compared to the 2024 preliminary assessment from 58.39/100 to 46.93/100. The decreased weighted average VQA score was primarily due to decreased lack of weeds score and decreased organic litter scores.

Raw VQA scores are presented in Appendix 7.

Table 1 Weighted average VQA score for Natural Temperate Grassland within the offset site

EVC 132_61: Plains Grassland				
		Maximum Score	Baseline Score (2026)	Target Score (2036)
Site Condition	Large Old Trees	10	N/A	N/A
	Canopy Cover	5	N/A	N/A
	Lack of Weeds	15	2.00	6.00*
	Understorey	25	13.64	15.00*
	Recruitment	10	5.66	6.00*
	Organic Litter	5	2.88	5.00*
	Logs	5	N/A	N/A
	Standardised Site Condition Score		**32.99**	**43.64**
Landscape Value	Patch Size	10	7.20	-
	Neighbourhood	10	2.87	-
	Distance to Core	5	3.87	-
	Total Landscape Score#		13.95	-
VQA Score		**100**	**46.93**	**≥57.58**
Habitat Score^		**10**	**5**	**6**

*These targets are not likely to be mandated in the anticipated OMP but are suggested goals in order to achieve the overall target habitat scores.
#The landscape score is largely outside the control of the landowner, so no targets have been set for this. In calculating the total VQA score, it has been assumed that the landscape score would not change.
^The habitat score is equivalent to the VQA score, rounded from a score out of 100 to an integer score out of 10 for the purposes of EPBC Act offset calculations.

2.2 Weed management

The cover of weed species across the offset site was high in November 2025. Mean total weed cover across the offset site was 96.5% (±SE 0.9, n=13). Of the weeds present, low threat weeds were most abundant, with a mean cover of 94.0% (±SE 1.2, n=13). High threat weed cover was 27.2% (±SE 5.6, n=13), making up only 28% of the total weed cover. Woody weed species were not recorded along the transects, but four specimens were observed of African Box-thorn *Lycium ferocissimum* within the offset site. Table 2 presents a summary of baseline weed covers recorded across the offset site.

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Table 2 Baseline weed cover along permanent point intercept transects

Transect (T)	Woody weed cover (%)	Total herbaceous weed cover (%)	Breakdown of total herbaceous weed cover			
			Low threat herbaceous weed cover (%)	High threat broad-leaved weed cover (%)	High threat perennial tussock grass weed cover (%)	High threat perennial mat-forming grassy weed cover (%)
1	0	92.0	92.0	4.0	16.0	0.0
2	0	100.0	100.0	14.0	14.0	0.0
3	0	96.0	92.0	0.0	8.0	2.0
4	0	100.0	98.04	16.0	50.0	2.0
5	0	94.0	94.0	2.0	2.0	6.0
6	0	98.0	94.0	0.0	6.0	12.0
7	0	94.0	86.0	22.0	10.0	8.0
8	0	96.0	96.0	0.0	2.0	0.0
9	0	98.0	98.0	6.0	4.0	0.0
10	0	100.0	100.0	0.0	58.0	0.0
11	0	90.0	88.0	0.0	20.0	0.0
12	0	96.0	92.0	2.0	4.0	18.0
13	0	100.0	92.0	6.0	44.0	8.0
Whole of Offset Site Mean (± SE)	**0 (±0)**	**96.5 (±0.9)**	**94.0 (±1.2)**	**5.5 (±2.0)**	**18.3 (±5.4)**	**4.3 (±1.6)**

Table 3 presents the average cover of high threat and low threat herbaceous weeds captured from the thirteen point intercept transects within Natural Temperate Grassland (n=13), ordered from highest to lowest cover. Weed species with the highest recorded cover were Fescue *Vulpia* spp. (59.5% cover) and Subterranean Clover *Trifolium subterraneum* (29.5% cover). The high threat weed species with the greatest cover was Toowoomba Canary Grass *Phalaris aquatica* (14.2% cover).

A baseline flora species list for the offset site is included in Appendix 2. This will be used to determine novel weed species in future years. Noxious weeds recorded within the offset site (as incidental observations and along transects) during baseline monitoring include (Figure 3):

- African Box-thorn *Lycium ferocissimum*
- Spear Thistle *Cirsium vulgare*
- Variegated Thistle *Silybum marianum*

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Table 3 Baseline cover of high and low threat herbaceous weed species within the offset site

Scientific name	Common name	Mean cover (± SE)
High threat weeds		
Phalaris aquatica	Toowoomba Canary-grass	14.2% (±3.1)
Hypochaeris radicata	Flatweed	5.5% (±1.2)
Alopecurus pratensis	Meadow Fox-tail	4.3% (±2.8)
Holcus lanatus	Yorkshire Fog	3.2% (±0.7)
Anthoxanthum odoratum	Sweet Vernal-grass	1.4% (±4.0)
Low threat weeds		
***Vulpia* spp.**	Fescue	59.5% (±4.1)
Trifolium subterraneum	Subterranean Clover	29.5% (±4.1)
Aira elegantissima	Delicate Hair-grass	24.8% (±0.9)
Arctotheca calendula	Cape Weed	22.5% (±0.2)
Lolium rigidum	Wimmera Rye-grass	11.2% (±4.8)
Romulea rosea	Onion Grass	10.6% (±0.2)
Erodium botrys	Big Heron's-bill	10.0% (±3.1)
Briza minor	Lesser Quaking-grass	10.0% (±0.3)
Bromus hordeaceus	Soft Brome	5.7% (±2.0)
Trifolium striatum	Knotted Clover	2.2% (±0.3)
Cynosurus echinatus	Rough Dog's Tail	1.7% (±2.2)
Bromus diandrus	Great Brome	1.7% (±0.7)
Moenchia erecta	Erect Chickweed	0.5% (±0.3)
Lolium perenne	Perennial Rye-grass	0.5% (±0.2)
Briza maxima	Large Quaking-grass	0.5% (±6.0)
Cerastium glomeratum	Common Mouse-ear Chickweed	0.3% (±0.9)
Acetosella vulgaris	Sheep Sorrel	0.3% (±1.6)
***Stellaria* spp.**	Starwort	0.2% (±6.5)
Avena sativa	Oat	0.2% (±0.3)

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2.3 Pest animal control

No pest animals were observed during baseline monitoring. Table 4 summarises herbivore and pest animal activity along monitoring transects, inferred from the frequency of scat density at each of the 1 x 1 metre quadrats along the belt transects.

Examination of the 1 x 1 metre quadrat data indicates that scats were absent in 80% of quadrats. Scats that were recorded were attributed to cattle and macropods (primarily kangaroos). Cattle and kangaroos are not treated as pest animals for the purposes of this analysis. Ground disturbance attributable to pest animals was recorded along transects at one point intercept location (along Transect 1), which is equivalent to a ground disturbance cover of 0.2% when extrapolated across the offset site.

There are anecdotal records of Deer *Cervidae* spp. occurring within the wider property, however no signs of Deer activity were recorded within the offset site during the baseline monitoring.

Table 4 Baseline frequency of herbivore and/or pest animal scat density along belt transects

Scat Density	Frequency of scat density in 1 x 1 m quadrats (n=65)
Absent	52
Scarce	10
Common	3
Abundant	0

*Note: Frequencies for the whole offset site consider scats of all species, whether pest animals or not.

2.4 Ground cover biomass control

2.4.1 Inter-tussock space and organic litter

Inter-tussock space measured along the fixed transects varied widely, with results between 8% and 72% cover. Mean inter-tussock space across all transects was 46.3% (±SE 5.0, n=13) (Table 5). Table 5 also presents the mean percentage cover of organic litter for each transect, 48.8% (±SE 5.0) across the offset site.

2.4.2 Golf ball method and maximum vegetation height

A mean golf ball score of 4.6 (±SE 0.5, n = 65) and a mean maximum vegetation height of 73.2 centimetres (±SE 3.3, n = 65) was recorded across the transects. This golf ball score indicates moderate levels of biomass accumulation (Table 5). Maximum vegetation height will be used to inform future management of biomass levels when interpreted alongside other biomass metrics as presented in Table 5.

Table 5 Summary of baseline biomass metrics along permanent point intercept transects

Transect	Mean cover (%) of inter-tussock space	Mean cover (%) of organic litter*	Mean golf ball score	Mean maximum vegetation height (cm)
1	14.0	76.0	7.8	54.0
2	8.0	92.0	6.3	50.0
3	46.0	48.0	6.6	71.0
4	42.0	56.0	2.9	95.0
5	56.0	42.0	6.1	58.0

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Transect	Mean cover (%) of inter-tussock space	Mean cover (%) of organic litter*	Mean golf ball score	Mean maximum vegetation height (cm)
6	44.0	52.0	1.8	70.0
7	62.0	30.0	4.6	91.0
8	64.0	32.0	3.4	58.0
9	52.0	42.0	1.6	58.0
10	72.0	26.0	5.4	109.0
11	44.0	46.0	6.9	71.0
12	44.0	50.0	4.4	59.0
13	54.0	42.0	1.8	107.0
Mean (± SE)	**46.3 (±5.0)**	**48.8 (±5.0)**	**4.6 (±0.5)**	**73.2 (±3.3)**
Target 2034	**>20% and ≤40%^**	**≥5% and ≤15%***	**≥15 – low biomass^**	**Target TBC***

* Target to be confirmed by the OMP, which is yet to be finalised.
^These targets are not mandated but are suggested targets to achieve the overall site condition score target and to help inform management strategies.

3 Discussion

3.1 Vegetation condition

It is anticipated that the OMP will specify a target habitat quality score of at least 6/10 for the offset site based on current OMPs for similar Natural Temperate Grassland Offset sites. The weighted average VQA score of Natural Temperate Grassland at the [redacted] offset site decreased from 58.39/100 in November 2024 to 46.93/100 in December 2025 (Table 1).

The Natural Temperate Grassland patches throughout the [redacted] Offset consistently scored low for understorey condition due to low native species biomass and cover and a high cover of weeds during the baseline assessment. Weed management will be a necessary tool to ensure that the condition of the Natural Temperate Grassland does not degrade further by limiting the spread of weeds. Planting of indigenous species following weed management may also help in further reducing the spread of weeds and could improve the condition of the Natural Temperate Grassland by re-introducing the following life forms, which are either missing or underrepresented in terms of diversity:

- Small herbs
- Large herbs
- Medium herbs
- Large tufted graminoids
- Medium non-tufted graminoids.

Baseline Monitoring – Recommendation 1

To improve the condition of Natural Temperate Grassland:

- Reduce the cover of weeds by increasing weed control and other management strategies as appropriate (i.e. pulse grazing and ecological burning).
- Reintroduce missing plant lifeforms including:
  - Large herbs
  - Large tufted graminoids
- Increase the cover of the following lifeforms:
  - Small herbs
  - Medium herbs
  - Medium non-tufted graminoids
- Reduce the cover of organic litter to benchmark levels (≥5% and ≤15% cover).

3.2 Weed management

Weed management will be fundamental to meeting offset management objectives and therefore to the success of the offset site. Improvements to the quality of Natural Temperate Grassland within the offset site will require weed management through application of a variety of techniques.

Across the offset site, weed cover is dominated by low threat weeds, such as Fescue *Vulpia* spp. and Subterranean Clover *Trifolium subterraneum* (Table 3). However, high threat weeds are also present within the offset site and Figure 3 identifies the areas in which high threat weeds should be prioritised. These areas support a high cover of Toowoomba Canary-grass, Tall Wheat-grass *Lophopyrum ponticum*, Meadow Fox-tail

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Alopecurus pratensis and Spear Thistle *Cirsium vulgare* (Photo 37). A primary goal of weed management should be to minimise the spread of high threat weeds throughout the offset site.

Given the size of the property, it is recommended that the weed management program within the [redacted] offset site incorporate a combined approach of ecological burning (where possible) and pulse grazing (preferably with sheep), alongside more typical weed management actions such as herbicide application. Where ecological burning of the [redacted] offset is possible, it can be undertaken regularly and followed up by the targeted application of herbicides to suppress weed cover. Ecological burning needs to be undertaken at the appropriate time of year and under optimal conditions, making it a challenging form of weed management. Further, the risks to neighbouring properties may be too high in some years to effectively burn parts of the [redacted] offset site. As such, the weed management and biomass management plans for this offset site will need to incorporate multiple approaches to be successful.

During the preliminary assessment (2024) Cattle grazing was noted as having occurred within the preceding months. While still present, Toowoomba Canary-grass occupied a much lower cover across the site in 2024 than 2025. This is likely the result of the removal of grazing from the Offset site in 2024 and the high rainfall recorded in the latter months of 2025. As such, it is understood that grazing may have resulted in the reduction of biomass of certain weeds such as Toowoomba Canary-grass across the [redacted] offset.

A final OMP will outline the requirements for the resumption of grazing at the [redacted] offset site including timing and stock type. However, at this stage it is understood that grazing will be a necessary tool to maintain biomass and reduce weed cover across the [redacted] offset site. While cattle have been the primary grazing stock utilised at the [redacted] property to date, sheep are considered more suitable for managing biomass and weed cover while also minimising indirect impacts to the [redacted] offset such as soil disturbance.

It is recommended that a weed control plan that utilises regular burning and pulse grazing with intensive follow-up weed control be prepared to improve the condition and extent of the Natural Temperate Grassland.

Baseline Monitoring – Recommendation 2

General weed control recommendations:

- Develop a weed control plan that outlines the weed species, priorities and control.
- Prioritise the control of high threat weeds identified in **Figure 3** and across the offset site.
- Frequent monitoring should be incorporated into the weed control plan to ensure management is effective and to document any new and emerging weed species within the offset area.
- **Develop an ecological burn plan, to be implemented in conjunction with the weed control and revegetation plans. Regular burning should be implemented to trigger natural recruitment, increase native species cover and reduce weed invasion.**
- **Focus weed control, including spot spraying, on the perimeter of the patches to prevent any contraction in the extent of Natural Temperate Grassland on the property.**
- **Implement pulse grazing to reduce weed species cover.**

3.3 Pest animal control

Ground surface disturbance attributable to pest animal activity was negligible (recorded at one point intercept) and no rabbit warrens or fox dens were detected within the offset site. It should be noted that the land manager has reported observations of deer in areas adjacent to the offset site. As such, deer may present as a potential emerging pest species within the offset site in future years. It is important to continue to closely monitor pest activities and undertake management when required.

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Baseline Monitoring – Recommendation 3

General pest animal control recommendations:

- Undertake active management and monitoring to reduce pest animals within the offset site.
- Monitor potential emerging pest species including deer and implement active management when required.

3.4 Ground cover biomass

Most of the metrics used to interpret ground cover biomass are outside the optimal ranges where natural recruitment of native flora is likely to occur within grassy ecosystems (Table 5). For example:

- Inter-tussock space is 46.3% (±SE 5.0), which is outside the optimal range of 20-40% and can provide space for weed encroachment.
- Golf balls placed within each monitoring quadrat (using the golf ball method of assessing biomass) were not greatly visible on average (mean golf ball score of 4.6 ±SE 0.5). This indicates high levels of biomass accumulation, when low biomass (golf ball score of ≥15) would be optimal.
- Mean organic litter cover was 48.8% (±SE 5.0) across the offset site. This exceeds the benchmark (optimal) level specified for this vegetation type, which would be within the range of ≥5% and ≤15% cover.

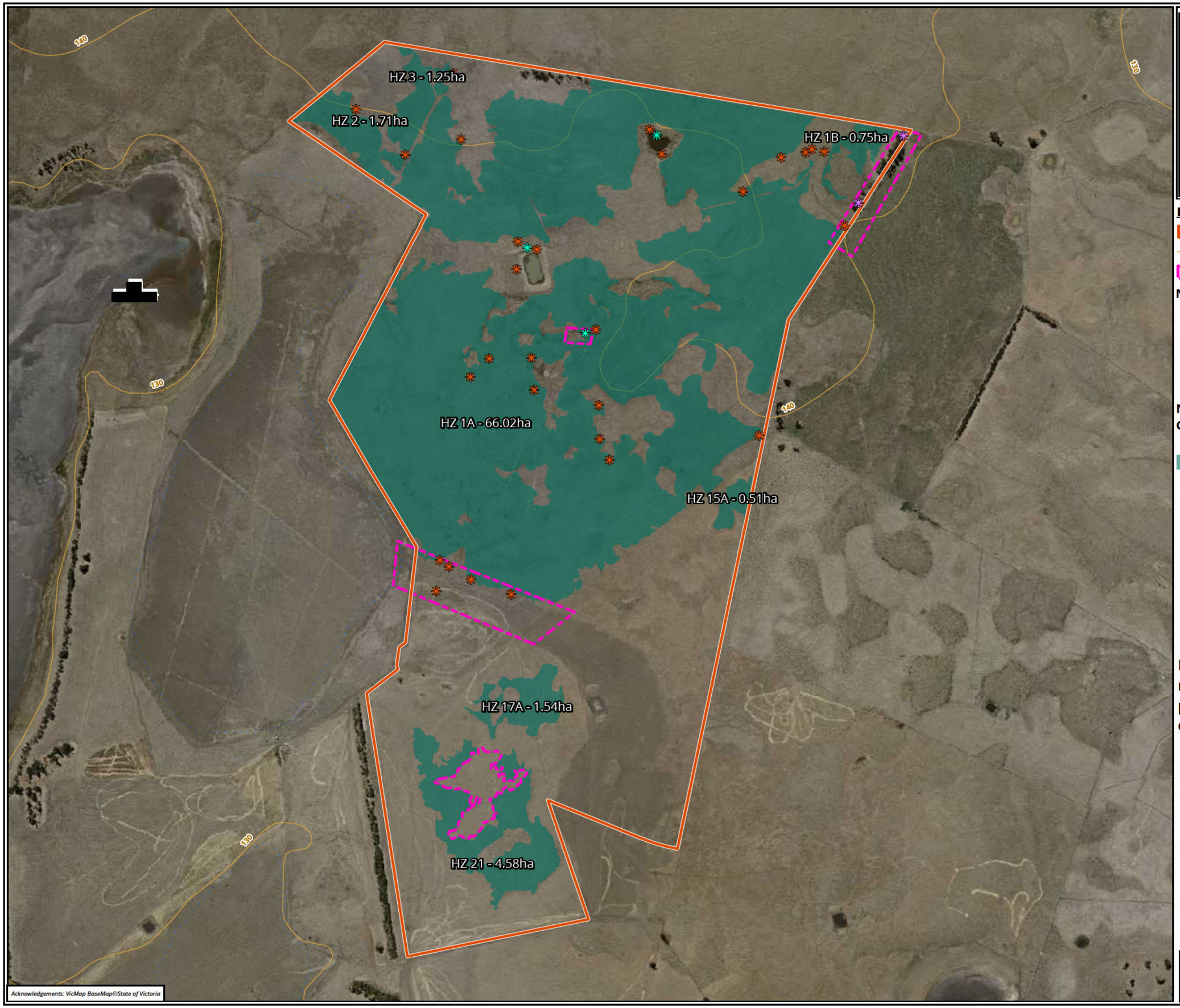
While high inter-tussock space and high biomass appear to be contradictory findings, this is most likely driven by the predominance of annual weeds across the [redacted] offset. During the assessment, annual weeds were beginning to senesce, falling to the ground but remaining attached. These annual weeds greatly reduced the visibility of the ground (hence the low golf ball scores), but were not impacting the bare ground beneath. As a result, the site exhibited areas of high standing biomass while still maintaining relatively high levels of inter-tussock space.

Baseline Monitoring – Recommendation 4

Conduct ecological burning and pulse grazing (preferably using sheep) so that:

- Ground cover biomass levels are reduced.
- Cover of organic litter is reduced.

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[redacted]

Legend

- Study area
- Contour 10m interval
- Priority weed management zone

Noxious weeds

- African Box-thorn - *Lycium ferocissimum*
- Spear Thistle - *Cirsium vulgare*
- Variegated Thistle - *Silybum marianum*

Nationally threatened Ecological Community (EPBC Act)

- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

Figure 3 Locations of incidental noxious weed observations and pest animal disturbance made during vegetation assessments

0 50 100 150 200 250

Metres

Scale: 1:7,500 @ A3

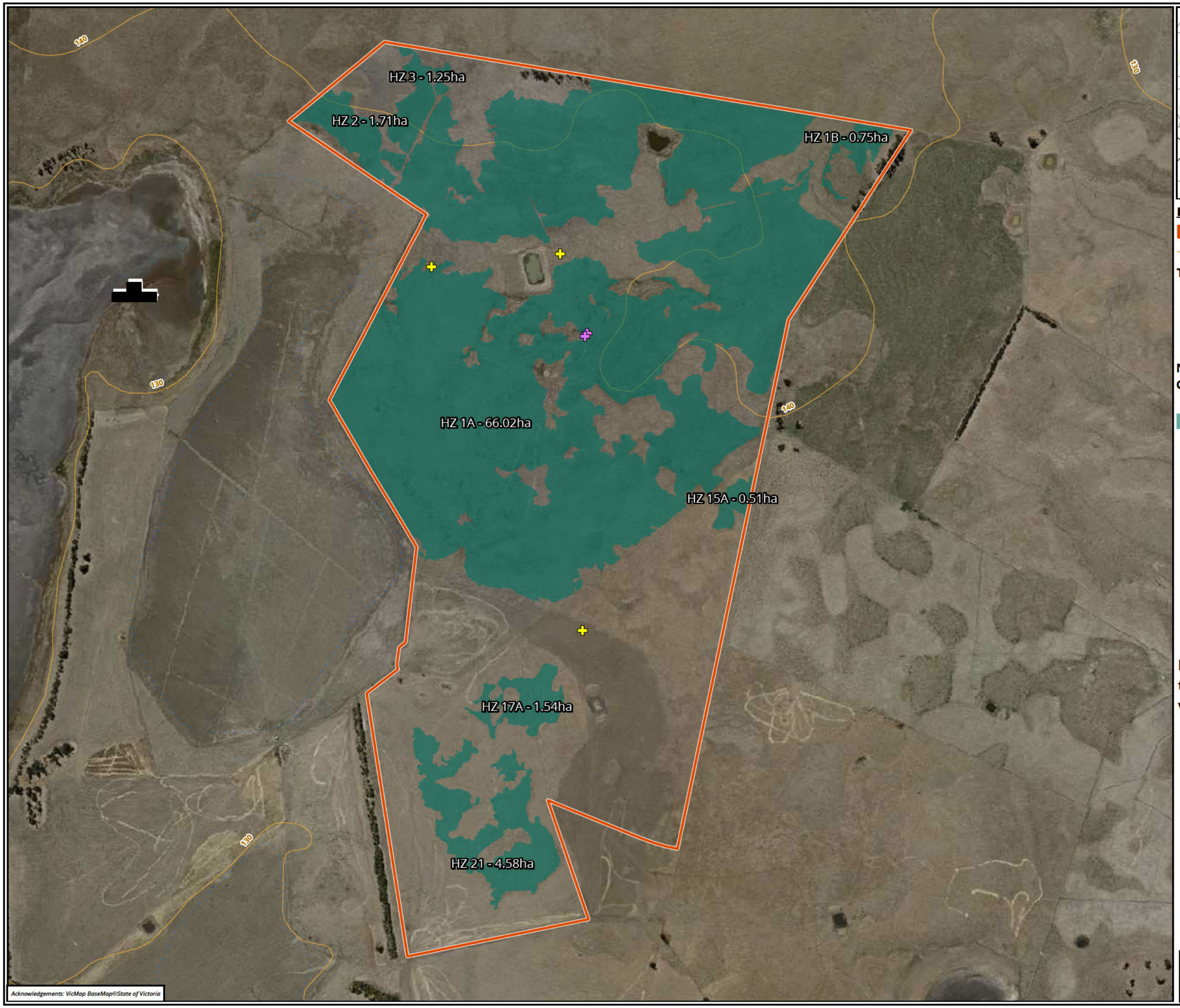
Coordinate System: GDA2020 MGA Zone 54

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[redacted]



Legend

- Study area
- Contour 10m interval

Threatened flora observations

- Pale-flower Crane's-bill - *Geranium sp. 3*
- Pale Swamp Everlasting - *Coronidium gunnianum*

Nationally threatened Ecological Community (EPBC Act)

- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

Figure 4 Locations of threatened flora made during vegetation assessments

0 50 100 150 200 250

Metres

Scale: 1:7,500 @ A3

Coordinate System: GDA2020 MGA Zone 54

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4 Assessment of results against management targets

The baseline monitoring results indicate that management actions will be required to maintain and improve the quality of vegetation.

Overall, weed cover is very high and is dominated by low threat weeds. These weeds are manageable, provided focused effort is placed on their management and regular monitoring is conducted to ensure other (novel) weeds that are more difficult to eradicate are prevented from establishing (i.e. Chilean Needle-grass *Nassella neesiana*). Improving the condition of Natural Temperate Grassland will require further enrichment through ecological burning, pulse grazing and revegetation programs.

Table 6 provides a summary of baseline monitoring results in the context of management objectives and expected targets.

Table 6 Assessment of baseline results against management objectives and targets

Parameter	Target at end of 10 years of management (2036)	Baseline result	Observations
Natural Temperate Grassland habitat quality (VQA score)*	6/10	5/10 (VQA score of 46.93/100)	Weed control, ecological burning, pulse grazing and strategic revegetation of the understorey will improve the VQA score. Follow recommendations 1 and 2.
Total weed cover*	≤50% cover	96.5% (±SE 0.9)	Intensify weed control efforts. Follow recommendations 1 and 2.
High threat weed cover*	≤50% of total weed cover	Total high threat weed cover: 27.2% (±SE 5.6) As a proportion of total weed cover: 28.2%	Prioritise the control of high threat weeds across the offset site (Figure 3) Follow recommendations 1 and 2.
Woody weed cover	Woody weeds eliminated (i.e. <1% cover)	Four observations of woody weed species African Box-thorn *Lycium ferocissimum* were recorded within the offset site. The cover of this species is currently >1%.	As a priority, control woody weeds across the entire offset site as soon as seasonally appropriate and continue to monitor for woody weeds. Follow recommendation 2.
New and emerging weeds	<1% cover	List of weed species consolidated from the baseline assessment (Appendix 2) and will assist in determining new and emerging weeds.	Continue to conduct regular site inspections and walkovers of the entire offset site to monitor for the presence of new and emerging weeds. Control as soon as seasonally appropriate.

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Parameter	Target at end of 10 years of management (2036)	Baseline result	Observations
Pest animals	Negligible (<1%) surface disturbance caused by pest animals	Ground disturbance cover of 0.2% across the offset site..	Continue to monitor and control immediately upon detection. Follow recommendation 3.
	No active rabbit warrens or fox dens	None observed during baseline assessment.	
	New and emerging pest animals controlled	New and emerging pest animals will be determined in subsequent monitoring years.	
Ground cover biomass	Inter-tussock space target >20% and ≤40% cover^	46.3% (±SE 5.0)	Inter-tussock space is greater than the optimal range for recruitment to occur within Natural Temperate Grassland. Follow recommendation 4.
	Low biomass (golf ball score ≥15)^	High biomass (mean golf ball score = 4.6 ±SE 0.5)	The golf ball score indicates that biomass levels are currently at high levels and will require management intervention to reduce. Follow recommendation 4.
	Organic litter target ≥5% and ≤15% cover^	48.8% (±SE 5.0)	Organic litter is high across the offset site. Follow recommendation 4.
Total herbaceous weed cover*	≤50% cover	96.5% (±SE 0.9) 90.0% (±SE 3.1%)	Follow recommendations 1 and 2.
Low threat herbaceous weeds*	≤50% cover	94.0% (±SE 1.2)	Weed control is required to reduce the level of low threat herbaceous weeds. Fescue has the highest cover across the offset site and can be effectively controlled through regular ecological burning in spring before seed set.
High threat broad-leaved weeds*	≤5% cover	5.5% (±SE 2.0)	High threat broad-leaved weeds (e.g. Flatweed and Spear Thistle) are at low levels.

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Parameter	Target at end of 10 years of management (2036)	Baseline result	Observations
High threat perennial tussock weeds*	≤15% cover	18.3% (±SE 5.4)	High threat perennial tussock weeds are at moderate covers across the offset site. Priority control should be given to the species with the highest covers i.e. currently Toowoomba Canary-grass.
High threat perennial mat-forming grassy weeds*	<5% cover	4.3% (±SE 1.6)	Low levels of high threat perennial mat-forming weeds (i.e. Meadow Fox-tail) are present.

Notes to table:
*Target to be confirmed once OMP has been finalised.
^These targets are not likely to be mandated in the final OMP but are suggested targets to achieve the overall site condition score target and to help inform management strategies.

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5 Summary of recommendations

The following recommendations have been provided throughout the body of this report to assist the landowner in prioritising initial on-ground management works to meet the future management objectives and targets. They are consolidated in Table 7, but must be interpreted in context with the supporting information within this report.

Table 7 Summary of recommendations provided throughout the baseline monitoring report

Recommendation	Details
1	To improve the condition of the vegetation: • Reduce the cover of weeds by increasing weed control and other management strategies as appropriate (i.e. pulse grazing and ecological burning). • Reintroduce missing plant lifeforms including: – Large herbs – Large tufted graminoids • Increase the cover of the following lifeforms: – Small herbs – Medium herbs – Medium non-tufted graminoids • Reduce the cover of organic litter to benchmark levels (≥5% and ≤15% cover).
2	To improve the condition of vegetation broadly across the offset site: • Develop a weed control plan that outlines the weed species, priorities and control strategies. • Prioritise the control of high threat weeds identified in Figure 3 and across the offset site. • Frequent monitoring should be incorporated into the weed control plan to ensure management is effective and to document any new and emerging weed species within the offset area. • Develop an ecological burn plan, to be implemented in conjunction with the weed control and revegetation plans. Regular burning should be implemented to trigger natural recruitment, increase native species cover and reduce weed invasion. • Focus weed control, including spot spraying, on the perimeter of the patches to prevent any further contraction in the extent of Natural Temperate Grassland on the property. • Implement pulse grazing to reduce weed species biomass.
3	To protect flora from pest animal herbivory: • Undertake active management and monitoring to reduce pest animals within the offset site. • Monitor potential emerging pest species including deer and implement active management when required.
4	Implement an ecological burning program and pulse grazing (preferably using sheep) so that: • Ground cover biomass levels are reduced. • Cover of organic litter is improved.

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Appendices

Appendix 1 Permanent transect and photo point locations

[redacted]

Transect Number	Transect End	Easting*	Northing*
[redacted]			

*Note: Coordinate system is GDA 2020 MGA Zone 54.

Table 9 Locations of permanent photo points within the offset site.

Photo point Number	Easting*	Northing*
[redacted]		

Appendix 2 Flora species list

The following abbreviations and symbols are relevant to this Appendix:

Code	Meaning	Reference
National listings (EPBC Act)		
CR	Critically endangered	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
EN	Endangered	
VU	Vulnerable	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (public land only)	
Noxious weed status (CaLP Act)		
SP	State prohibited species	Victorian *Catchment and Land Protection Act 1994* (CaLP Act)
RP	Regionally prohibited species	
RC	Regionally controlled species	
R	Restricted species	

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Table A2.1 Flora species observed within the offset site during baseline monitoring.

Status	Scientific Name	Common Name
Indigenous species		
	Acaena echinata	Sheep's Burr
	Anthosachne scabra s.s.	Common Wheat-grass
	Arthropodium sp. 3 (aff. strictum)	Small Chocolate-lily
	Arthropodium strictum s.s.	Chocolate Lily
	Asperula conferta	Common Woodruff
	Austrostipa oligostachya	Fine-head Spear-grass
	Calocephalus citreus	Lemon Beauty-heads
	Calocephalus lacteus	Milky Beauty-heads
	Carex inversa	Knob Sedge
	Chrysocephalum apiculatum s.s.	Common Everlasting
	Convolvulus angustissimus subsp. *angustissimus*	Blushing Bindweed
k	*Convolvulus angustissimus* subsp. *omnigracilis*	Slender Bindweed
cr	*Coronidium gunnianum*	Pale Swamp Everlasting
	Crassula sieberiana s.s.	Sieber Crassula
	Dichondra repens	Kidney-weed
	Epilobium hirtigerum	Hairy Willow-herb
	Eryngium vesiculosum	Prickfoot
	Euchiton involucratus s.s.	Star Cudweed
e	*Geranium sp. 3*	Pale-flower Crane's-bill
	Haloragis heterophylla	Varied Raspwort
	Juncus bufonius	Toad Rush
	Juncus flavidus	Gold Rush
	Juncus subsecundus	Finger Rush
	Lachnagrostis spp.	Blown Grass
	Laphangium luteoalbum	Jersey Cudweed
	Lobelia pratioides	Poison Lobelia
	Lomandra nana	Dwarf Mat-rush
	Lythrum hyssopifolia	Small Loosestrife
	Melicytus dentatus s.s.	Tree Violet
	Microlaena stipoides var. *stipoides*	Weeping Grass
	Oxalis exilis	Shade Wood-sorrel
	Oxalis perennans	Grassland Wood-sorrel
	Persicaria prostrata	Creeping Knotweed
	Plantago gaudichaudii	Narrow Plaintain
	Poa labillardierei var. *labillardierei*	Common Tussock-grass
	Potamogeton ochreatus	Blunt Pondweed
	Ranunculus spp.	Buttercup
	Rumex dumosus	Wiry Dock
	Rytidosperma bipartitum s.s.	Leafy Wallaby-grass

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Status	Scientific Name	Common Name
	Rytidosperma caespitosum	Common Wallaby-grass
	Rytidosperma duttonianum	Brown-black Wallaby-grass
	Rytidosperma racemosum var. *racemosum*	Slender Wallaby-grass
	Rytidosperma spp.	Wallaby Grass
	Solanum laciniatum	Large Kangaroo Apple
	Themeda triandra	Kangaroo Grass
	Wahlenbergia multicaulis	Branching Bluebell
Introduced species		
	Acetosella vulgaris	Sheep Sorrel
	Aira elegantissima	Delicate Hair-grass
	Aira spp.	Hair Grass
	Alopecurus pratensis	Meadow Fox-tail
	Anthoxanthum odoratum	Sweet Vernal-grass
	Arctotheca calendula	Cape Weed
	Avena barbata	Bearded Oat
	Avena fatua	Wild Oat
	Avena sativa	Oat
	Briza maxima	Large Quaking-grass
	Briza minor	Lesser Quaking-grass
	Bromus diandrus	Great Brome
	Bromus hordeaceus	Soft Brome
	Centaurium erythraea	Common Centaury
RC	*Cirsium vulgare*	Spear Thistle
	Cynosurus echinatus	Rough Dog's-tail
	Dactylis glomerata	Cocksfoot
	Erigeron bonariensis	Flaxleaf Fleabane
	Erigeron sumatrensis	Tall Fleabane
	Erodium botrys	Big Heron's-bill
	Festuca arundinacea	Tall Fescue
	Helminthotheca echoides	Ox-tongue
	Holcus lanatus	Yorkshire Fog
	Hordeum hystrix	Mediterranean Barley-grass
	Hordeum leporinum	Barley Grass
	Hordeum spp.	Barley Grass
	Hypochaeris radicata	Flatweed
	Lactuca serriola	Prickly Lettuce
	Leontodon saxatilis subsp. *saxatilis*	Hairy Hawkbit
	Lolium perenne	Perennial Rye-grass
	Lolium rigidum	Wimmera Rye-grass
	Lophopyrum (monotypic)	Tall Wheat-grass
RC	*Lycium ferocissimum*	African Box-thorn

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Status	Scientific Name	Common Name
	Malva nicaeensis	Mallow of Nice
	Phalaris aquatica	Toowoomba Canary-grass
	Phalaris minor	Lesser Canary-grass
	Poa bulbosa var. *bulbosa*	Bulbous Meadow-grass
	Romulea rosea	Onion Grass
	Rumex conglomeratus	Clustered Dock
	Rumex pulcher subsp. *pulcher*	Fiddle Dock
RC	*Silybum marianum*	Variegated Thistle
	Solanum nigrum s.s.	Black Nightshade
	Sonchus asper s.s.	Rough Sow-thistle
	Sonchus oleraceus	Common Sow-thistle
	Stellaria media	Chickweed
	Symphyotrichum subulatum	Aster-weed
	Trifolium campestre subsp. *campestre*	Hop Clover
	Trifolium fragiferum var. *fragiferum*	Strawberry Clover
	Trifolium repens var. *repens*	White Clover
	Trifolium subterraneum	Subterranean Clover
	Triticum aestivum	Wheat
	Vulpia bromoides	Squirrel-tail Fescue

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Appendix 3 Transect photo points



Photo 1 Transect 1 (A) photo point, southern end, facing north (dated 1 December 2025).

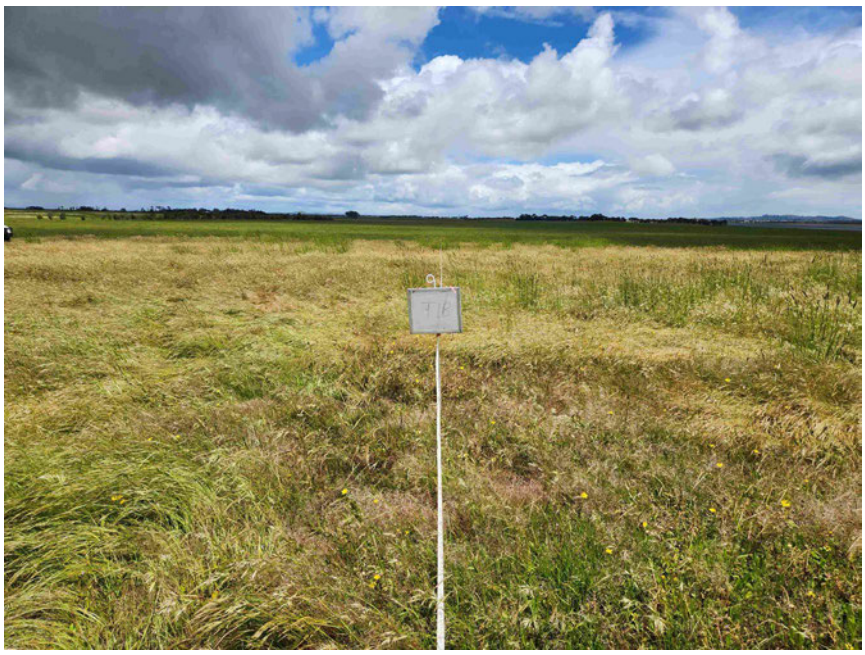


Photo 2 Transect 1 (B) photo point, northern end, facing south (dated 1 December 2025).

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Photo 3 Transect 2 (A) photo point, southern end, facing north (dated 1 December 2025).



Photo 4 Transect 2 (B) photo point, northern end, facing south (dated 1 December 2025).

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Photo 5 Transect 3 (A) photo point, southern end, facing north (dated 2 December 2025).

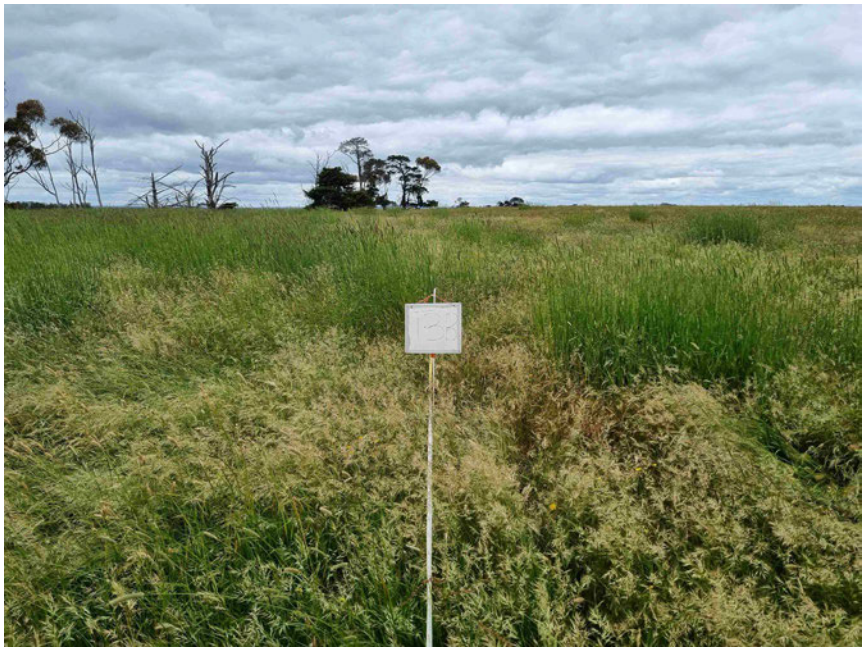


Photo 6 Transect 3 (B) photo point, northern end, facing south (dated 2 December 2025).

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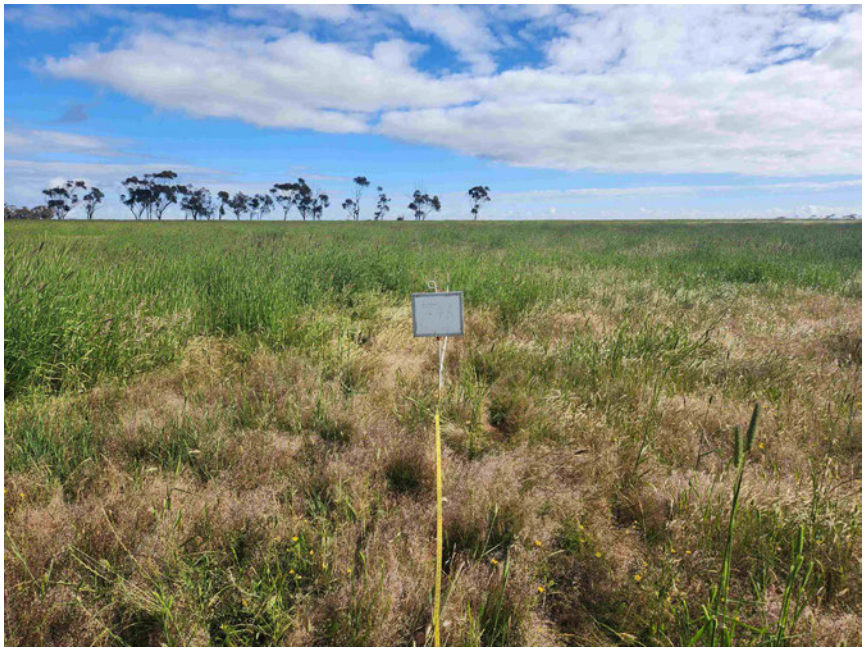


Photo 7 Transect 4 (A) photo point, southern end, facing north (dated 2 December 2025).

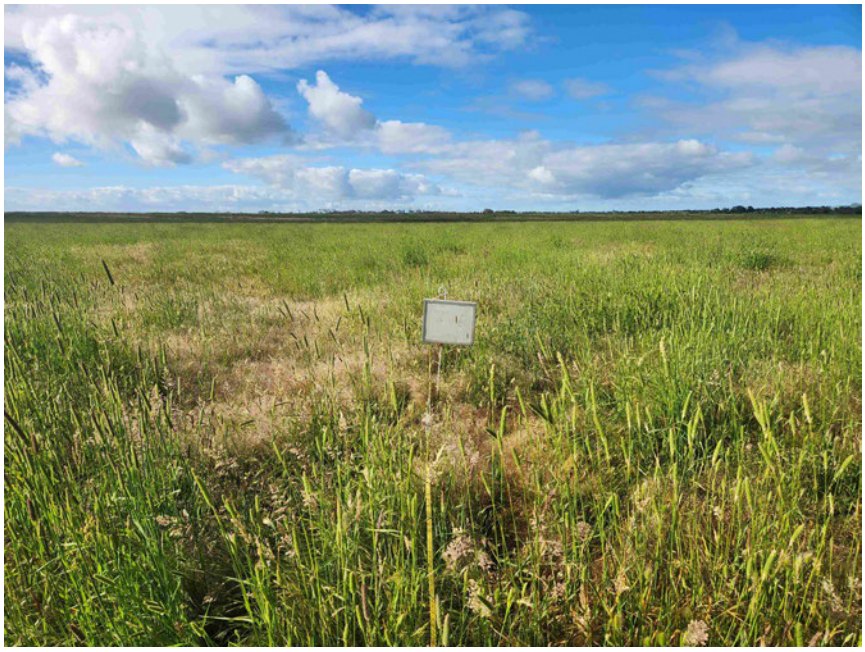


Photo 8 Transect 4 (B) photo point, northern end, facing south (dated 2 December 2025).

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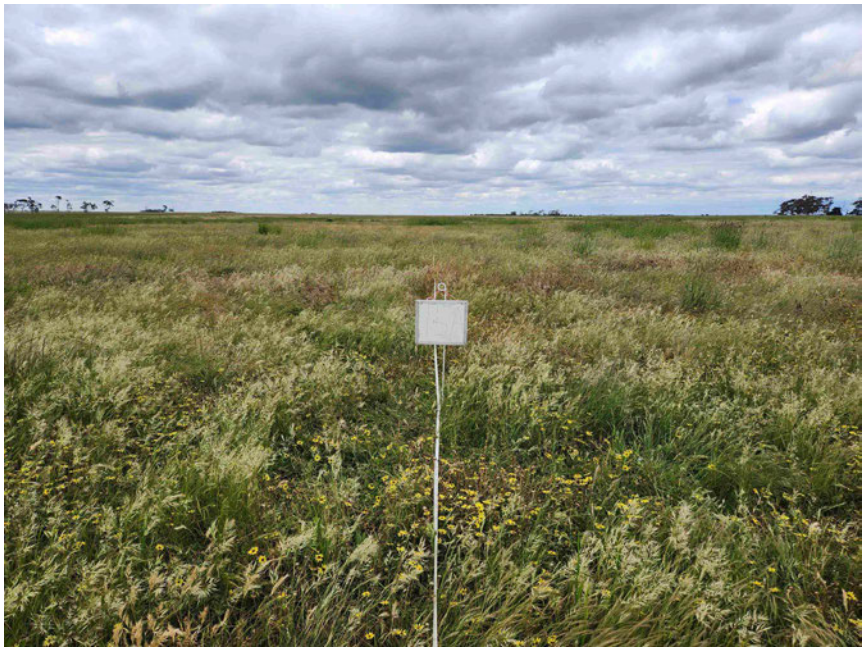


Photo 9 Transect 5 (A) photo point, southern end, facing north (dated 2 December 2025).



Photo 10 Transect 5 (B) photo point, northern end, facing south (dated 2 December 2025).

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Photo 11 Transect 6 (A) photo point, southern end, facing north (dated 2 December 2025).



Photo 12 Transect 6 (B) photo point, northern end, facing south (dated 2 December 2025).

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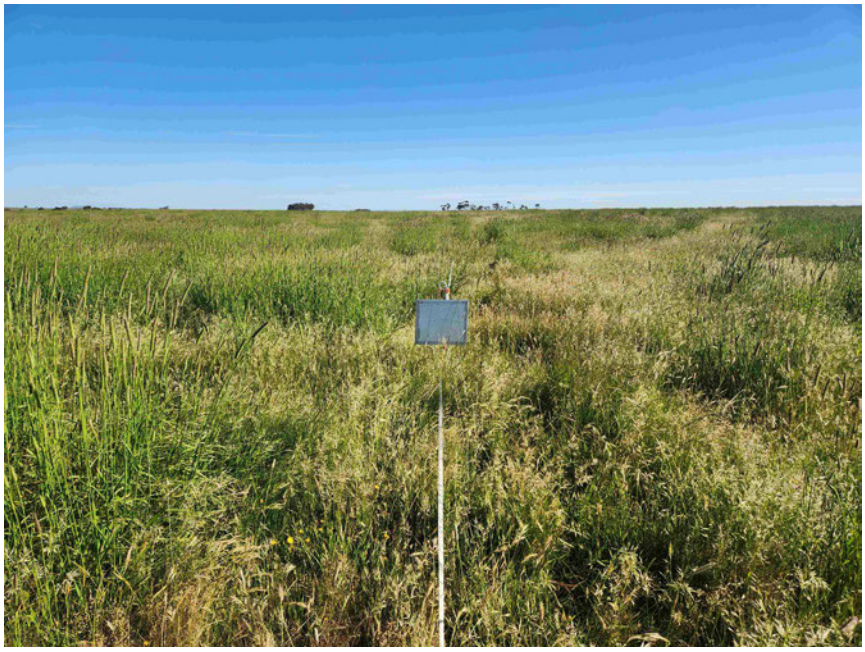


Photo 13 Transect 7 (A) photo point, southern end, facing north (dated 2 December 2025).



Photo 14 Transect 7 (B) photo point, northern end, facing south (dated 2 December 2025).

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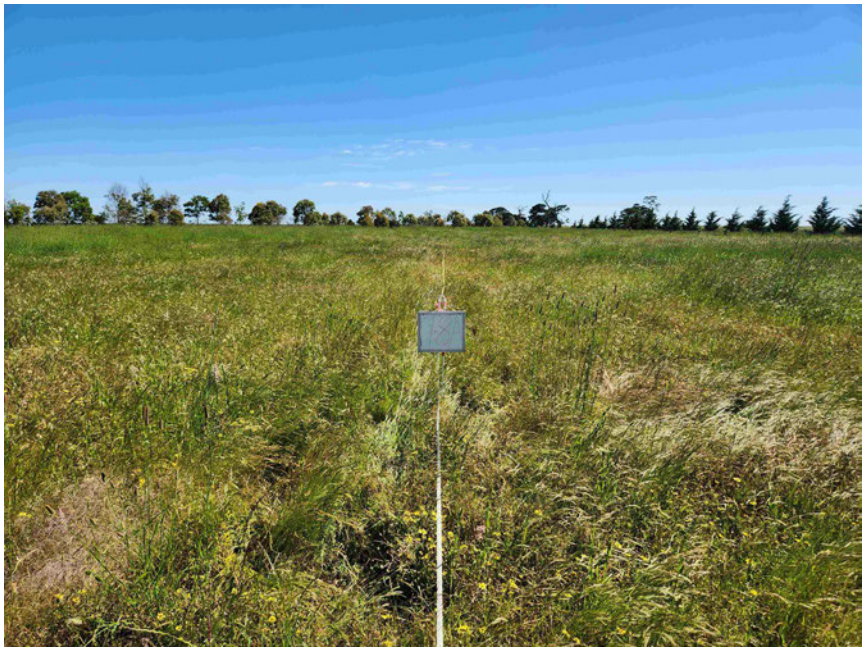


Photo 15 Transect 8 (A) photo point, southern end, facing north (dated 2 December 2025).

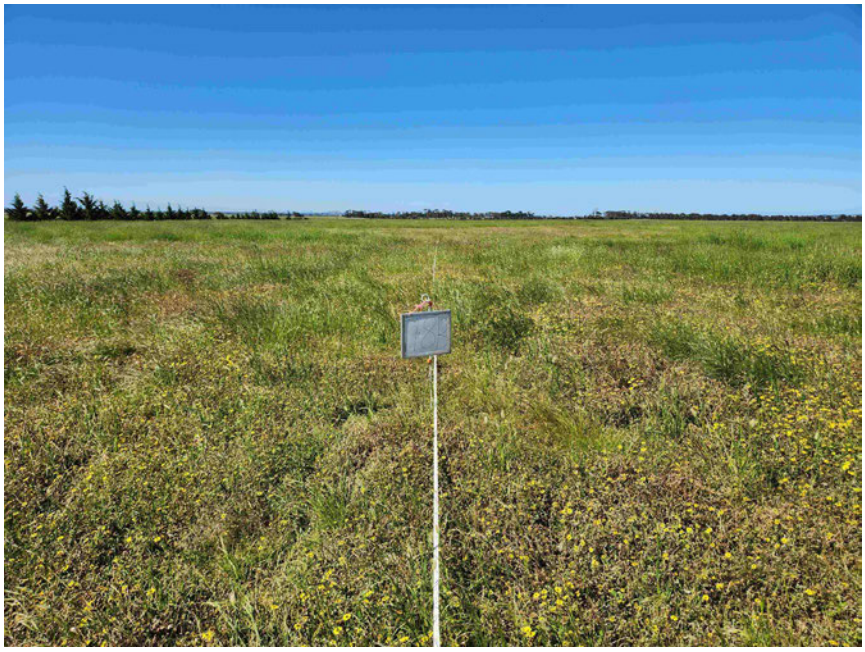


Photo 16 Transect 8 (B) photo point, northern end, facing south (dated 2 December 2025).

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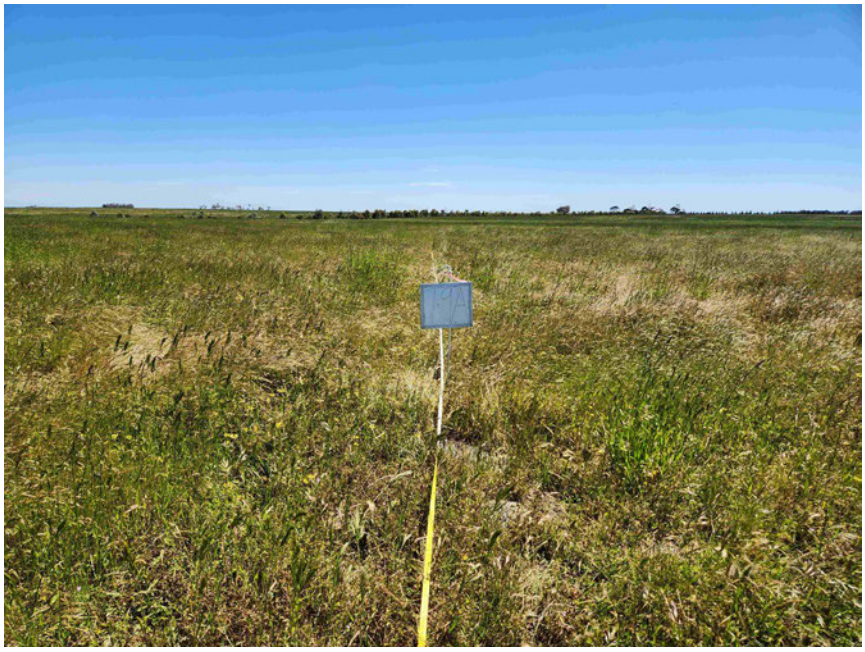


Photo 17 Transect 9 (A) photo point, southern end, facing north (dated 2 December 2025).

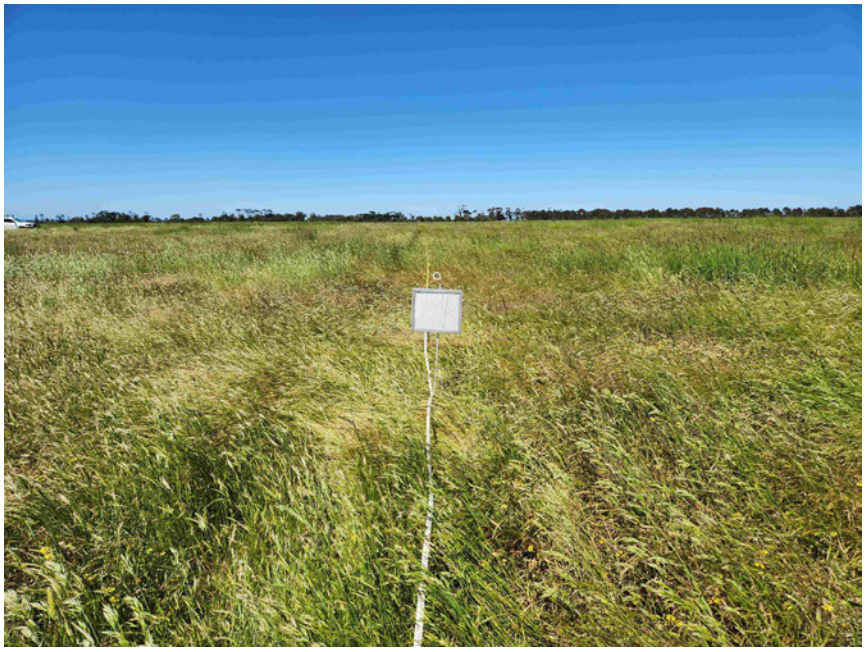


Photo 18 Transect 9 (B) photo point, northern end, facing south (dated 2 December 2025).

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Photo 19 Transect 10 (A) photo point, southern end, facing north (dated 2 December 2025).

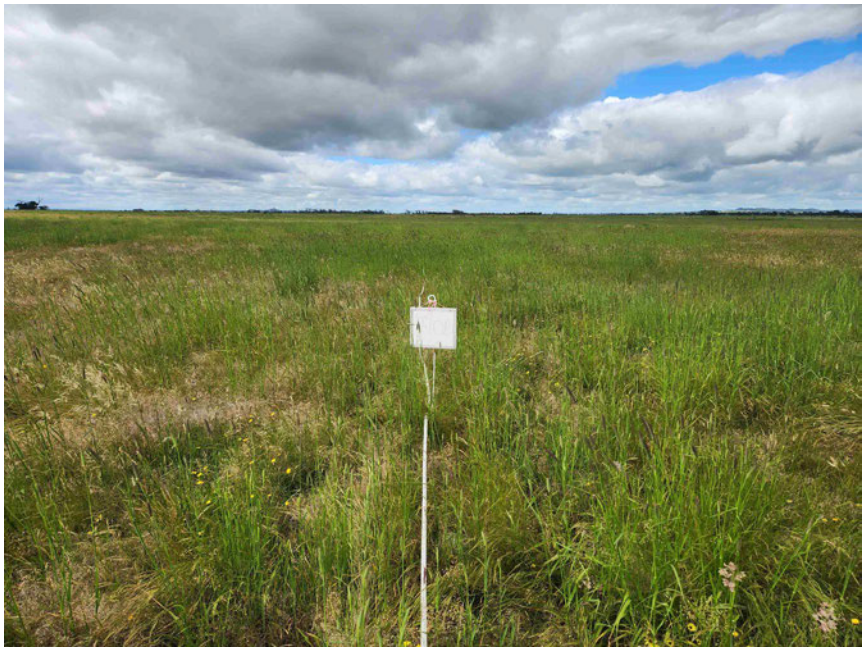


Photo 20 Transect 10 (B) photo point, northern end, facing south (dated 2 December 2025).

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Photo 21 Transect 11 (A) photo point, southern end, facing north (dated 2 December 2025).

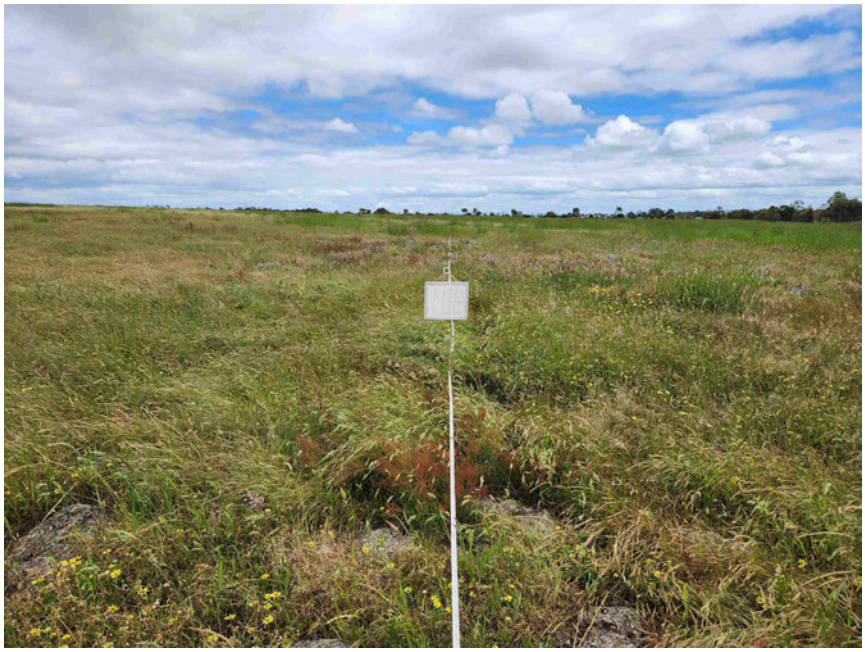


Photo 22 Transect 11 (B) photo point, northern end, facing south (dated 2 December 2025).

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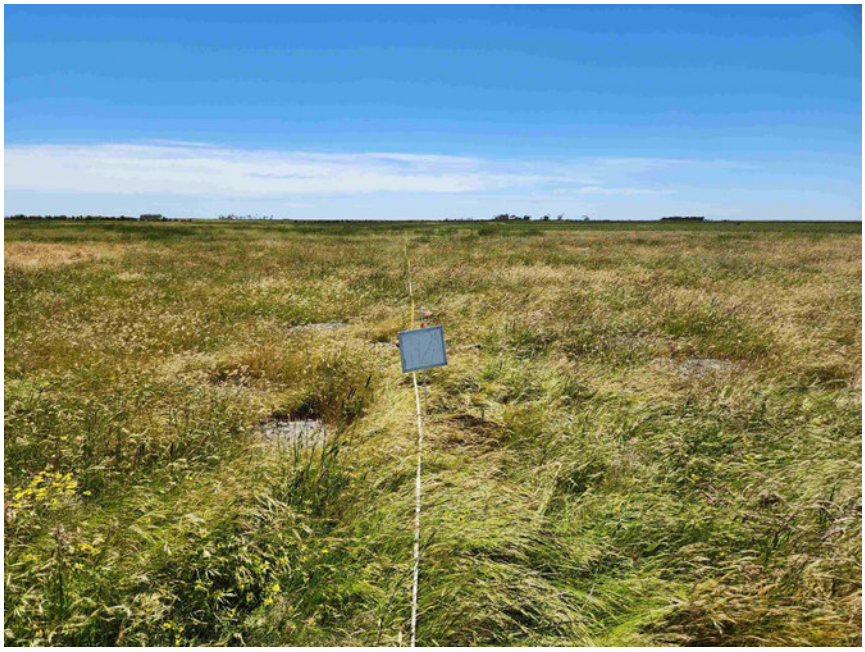


Photo 23 Transect 12 (A) photo point, southern end, facing north (dated 2 December 2025).



Photo 24 Transect 12 (B) photo point, northern end, facing south (dated 2 December 2025).

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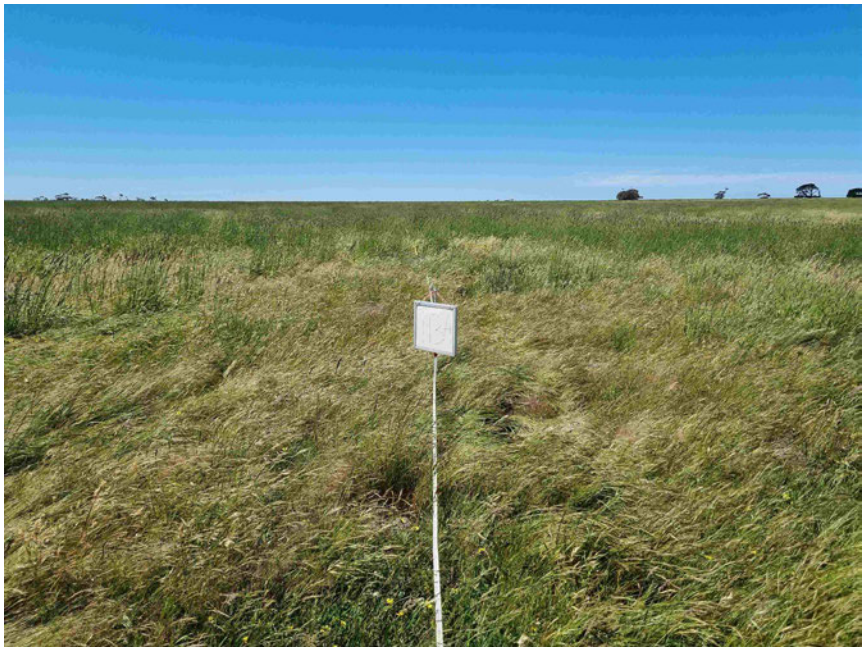


Photo 25 Transect 13 (A) photo point, southern end, facing north (dated 2 December 2025).



Photo 26 Transect 13 (B) photo point, northern end, facing south (dated 2 December 2025).

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Appendix 4 Photo points



Photo 27 Photo point 1 taken during the preliminary assessment (dated 22 November 2024).



Photo 28 Photo point 1 taken during the baseline assessment (dated 2 December 2025).

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Photo 29 Photo point 2 taken during the preliminary assessment (dated 22 November 2024



Photo 30 Photo point 2 taken during the baseline assessment (dated 2 December 2025).

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Photo 31 Photo point 3 taken during the preliminary assessment (dated 22 November 2024).



Photo 32 Photo point 3 taken during the baseline assessment (dated 2 December 2025).

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Photo 33 Photo point 4 taken during the preliminary assessment (dated 22 November 2024).



Photo 34 Photo point 4 taken during the baseline assessment (dated 2 December 2025).

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Photo 35 Photo point 5 taken during the preliminary assessment (dated 22 November 2024).



Photo 36 Photo point 5 taken during the baseline assessment (dated 2 December 2025).

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Appendix 5 General photos



Photo 37 High biomass of Toowoomba Canary-grass *Phalaris aquartica* and annual weed species (dated 2 December 2025).



Photo 38 Wallaby Grass *Rytidosperma* spp. dominating an area of the offset site (dated 2 December 2025).

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Photo 39 Point-intercept hitting Fescue *Vulpia* spp. and bareground (dated 2 December 2025).

Appendix 6 Methods

The baseline monitoring data was collected by a team of experienced botanists including Senior Botanist [redacted] and Senior Botanist [redacted]. The baseline monitoring in 2025 occurred over a total of 72 person hours from 1 December to 4 December 2025.

Vegetation mapping and quality assessment

In November 2024, the extent and quality of native vegetation at the [redacted] offset site was assessed using the same methodology that was used to assess the extent and quality of native vegetation at the impact site (Biosis 2025).

Native vegetation within the offset site was mapped in accordance with the Guidelines for the Removal, Destruction or Lopping of Native Vegetation (DELWP 2017). The extent of Natural Temperate Grassland was mapped with reference to EPBC Act listing advice for the threatened ecological community (TSSC 2008). The quality of Natural Temperate Grassland patches was assessed using the habitat hectares (VQA) scoring method (DSE 2004). A weighted average VQA score for all Natural Temperate Grassland within the offset site was calculated. The contribution that each patch made to the weighted average score was proportionate to the relative size of the patch (in hectares).

For the purposes of this assessment, the limit of resolution for identification of a patch of native vegetation was taken to be 0.001 habitat hectares (Hha). That is, if a discrete patch of native vegetation was present with sufficient cover but its condition and extent would not have resulted in the identification of at least 0.001 habitat hectares, the patch of vegetation was not mapped or included in the assessment.

Transect establishment and monitoring

Point intercept transects were established to assess the condition of native grassland objectively and repeatedly within the offset site and, in particular, assess progress towards meeting the defined offset management targets.

- Point-intercept transects.
- Interrupted belt transects (mini quadrats 1 x 1 metre).
- Golf ball method for measuring biomass levels.

Point-intercept transects (species frequency)

To quantitatively capture fine-scale changes in the condition of vegetation, a series of 50-metre long point intersect transects were established at the offset site. The start of each transect (southern end) was mapped using a GPS, which will allow transects to be re-established in the roughly the same location each year.

A point intercept method was used to objectively estimate the frequency (as a surrogate for cover) of plant species and ground conditions present along each transect. At each transect, a measuring tape was extended from the start peg (designated as 0 metres at the southern end of the transect) to the end peg (designated as 50 metres at the northern end of the transect). A 5-millimetre diameter steel pin (approximately 1 metre long) was inserted vertically into the vegetation at 1-metre intervals along the tape. At each interval, the following observations were recorded:

- The ground condition at the base of the pin, categorised as follows:

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  - **Organic litter**: detached plant material.
  - **Vascular vegetation:** living and attached vegetation (this category was used where the base of the pin rested on vegetation, such as the centre of a tussock grass or more commonly the rosette leaves of a herb).
  - **Rock**: substrate comprising cobbles, boulders or bedrock i.e. anything with a particle size greater than 64 millimetres and therefore not easily erodible (EPA 2021). This category was used when the pin rested directly on a rock surface and when the pin rested on bryophytes and lichen that had colonised the rock-surface.
  - **Bare ground**: substrate comprising silt, sand, gravel or pebbles i.e. anything with a particle size of 64 millimetres or less and therefore easily erodible (EPA 2021). This is divided into bare ground that is attributable to pest animal activity (as evidenced by presence of scats, diggings, herbivory or other indirect evidence) or natural bare ground.
  - **Bryophytes and lichen**: a broad grouping of attached non-vascular terrestrial plants, differentiated from soil crust by its vertical structure (DSE 2004).
  - **Soil crust:** a hard 'crust-like' layer, often with no vertical structure, formed on the soil surface by a combination of algae, crustose cryptogamic life forms and soil particles (DSE 2004).
  - **Water:** substrate consisting of running water or a standing pool or puddle of water (generally rare but possible after seasonal conditions or recent rainfall).
- All species of flora touching the pin along any part of the pin's length.
- The condition of each species touching the pin, categorised as follows:
  - **Alive:** where any living plant material belonging to the species in question is touching the pin, even if some of the material touching the pin is dead (living material is inferred by the presence of photosynthesising tissue i.e. 'green' tissue).
  - **Dead:** where all plant material belonging to the species in question and touching the pin is dead (inferred by a clear lack of photosynthesising tissue).

Importantly, more than one flora species and plant group may intercept with a given point along the transect, meaning that the cumulative cover of all of the above attributes may plausibly be more than 100%.

Throughout the report, mean values and ± standard error (SE) are presented when analysing data captured along the transects and within the quadrats.

Belt transect - mini quadrats (species cover)

Five 1 x 1 metre quadrats were established at 10 metre intervals along each 50 metre transect. These were located at the 5, 15, 25, 35 and 45 metre marks. This methodology is termed an 'interrupted belt transect'.

Variables measured at each quadrat included:

- Presence/absence and density of scats (Y/N) for Macropods, sheep, rabbits, foxes, cats (Table 9).
- Biomass. Measured using the Golf ball scoring system, described in further detail below.

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Table 10 Categories for classifying scat density in the 1 x 1m quadrats

Density	Description
Absent	No scats present
Scarce	Scats are not readily present (i.e. 1 – 2 scats)
Common	Scats are clearly visible (i.e 3 – 5 scats)
Abundant	Scats are obvious (i.e > 5 scats)

Location of transects

Thirteen point-intercept transects were established across the [redacted] offset site (Figure 2).

The location of monitoring transects and associated quadrats were randomly placed prior to commencing the monitoring. Transects were repositioned on the ground to the closest suitable location if the location was deemed unsuitable. For example, if a vehicle track or fence intersected the transect, then the start spot was moved the shortest distance to avoid the issue.

Golf ball method

Biomass accumulation was estimated within each of the five 1 x 1 metre quadrats along the 50 metre transect using the golf ball method (Parks Victoria 2014; Morgan 2015). Eighteen golf balls were randomly dropped into the 1 x 1 -metre quadrats from a height of approximately 1.3 metres. A photo was captured, positioned directly above the quadrat at approximately 1.3 metres high. From photo analysis, the visibility of the golf balls was scored as follows:

- Any golf ball that was more than 90% visible was given a score of 1.
- Any golf ball that was 33% to 90% visible was given a score of 0.5.
- Any golf ball that was less than 33% visible was given a score of 0 (zero).

Each 1 x 1 metre quadrat was therefore given a total biomass score out of 18 and averaged across the transect. Average golf ball scores for each transect can be categorised as follows (Parks Victoria 2014; Morgan 2015):

- High biomass (0-5): low golf ball visibility, which suggests that biomass reduction (e.g. through fire and/or grazing) is required.
- Moderate biomass (6-14): moderate golf ball visibility, which suggests that the need for biomass reduction should continue to be closely monitored.
- Low biomass (15-18): high golf ball visibility, which suggests that biomass reduction is not required and which typically represents better quality habitat for grassy ecosystems.

In addition to the golf ball score, the maximum understorey vegetation height (in centimetres) was also recorded at each point intercept along the transect as described previously. These two measures allow for greater interpretation of biomass levels.

Photo points

Two photo points were established at each transect, one at either end (i.e. at the 0-metre and 100-metre points), looking towards the centre of the transect. A whiteboard, labelled with the transect number and transect end (A: south, B: north), was placed 4 metres from each end towards the centre (i.e. at the 4-metre

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and 96-metre mark). A photo was then taken from the end of the transect, focussing on the whiteboard, which is aligned in the centre of the photo.

The following camera settings are important for consistency of photo point photos from year to year:

- Landscape mode
- Aspect ratio of 4:3
- Resolution of at least 72 dots per inch (dpi)
- No optical or digital magnification
- Natural lighting (no flash)
- Focussed on the whiteboard in the centre of the image.

Five additional general photo points were established during the baseline assessments which utilised previous photos taken during the preliminary assessment to provide a comparison of the general offset site conditions.

Surface disturbance by pest animals

Surface disturbance caused by pest animal activity can be an indication of pest animal numbers, can encourage weed encroachment and can impeded recruitment of native flora. Surface disturbance caused by pest animals can be inferred from an analysis of bare ground along the transects. Bare ground is attributed to pest animal activity (as opposed to natural causes) when pest animal scats, diggings, herbivory or other indirect evidence is also present.

Inter-tussock space

For grassland ecosystems, inter-tussock space is important for plant recruitment and is often used as a collective term for bare ground, bryophytes, lichens and soil crust, all of which provide a medium upon which plant recruitment can occur (DSE 2004). Inter-tussock space was taken to be the cumulative cover of bare ground, soil crust and bryophytes/lichens (DSE 2004) and was assessed using data obtained from the point intercept transects.

Organic litter accumulation

The persistent build-up of ground cover biomass is a known threat associated with the degradation of grassland environments. Organic litter was calculated using data obtained from the point intercept transects. There are no mandated organic litter targets defined in the OMP, but this metric can be used to inform management of the offset area.

General site inspection and walkover

In December 2025, the flora species list was updated during the baseline assessment with new observations and to reflect any changes to species nomenclature. The species list includes records of all flora observations made during the preliminary inspections, baseline monitoring and incidental observations made during site walk overs.

While the current species list is relatively comprehensive, it is not exhaustive. Some species may not have been observed due to their very low abundance, dormancy or seasonal conditions. While the timing of the site assessments has occurred during spring, which is the peak flowering period for many species, some species had recently finished flowering and others had not flowered yet. It is expected that more species will be added to the list in the coming years.

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During the site visits for baseline monitoring, relevant management issues were noted and, where appropriate, their locations were mapped using a GPS-enabled tablet, typically to an accuracy of 3 metres. Incidental records of pest animal activity (e.g. rabbit warrens) and noxious or high threat weeds (e.g. woody weeds and new/emerging weeds) were recorded during the baseline vegetation monitoring and site walkovers. The approximate extent of dense weed infestations, which should be a management priority, was also mapped. In future years, weeds will be considered to be new to the offset site if they do not appear on the baseline flora list (unless there is strong evidence to suggest that the species would have been present during baseline monitoring but was missed).

Data management

A project database was established and will be maintained allowing for data storage and protection, data extraction, quality control, analysis, interpretation, reporting and presentation.

Limitations and uncertainty

There are no significant limitations or uncertainties associated with this baseline monitoring. The monitoring surveys were conducted at an appropriate time of the year for assessment of grassy ecosystem, including an assessment of condition, extent and threats. However, the following qualifications should be noted:

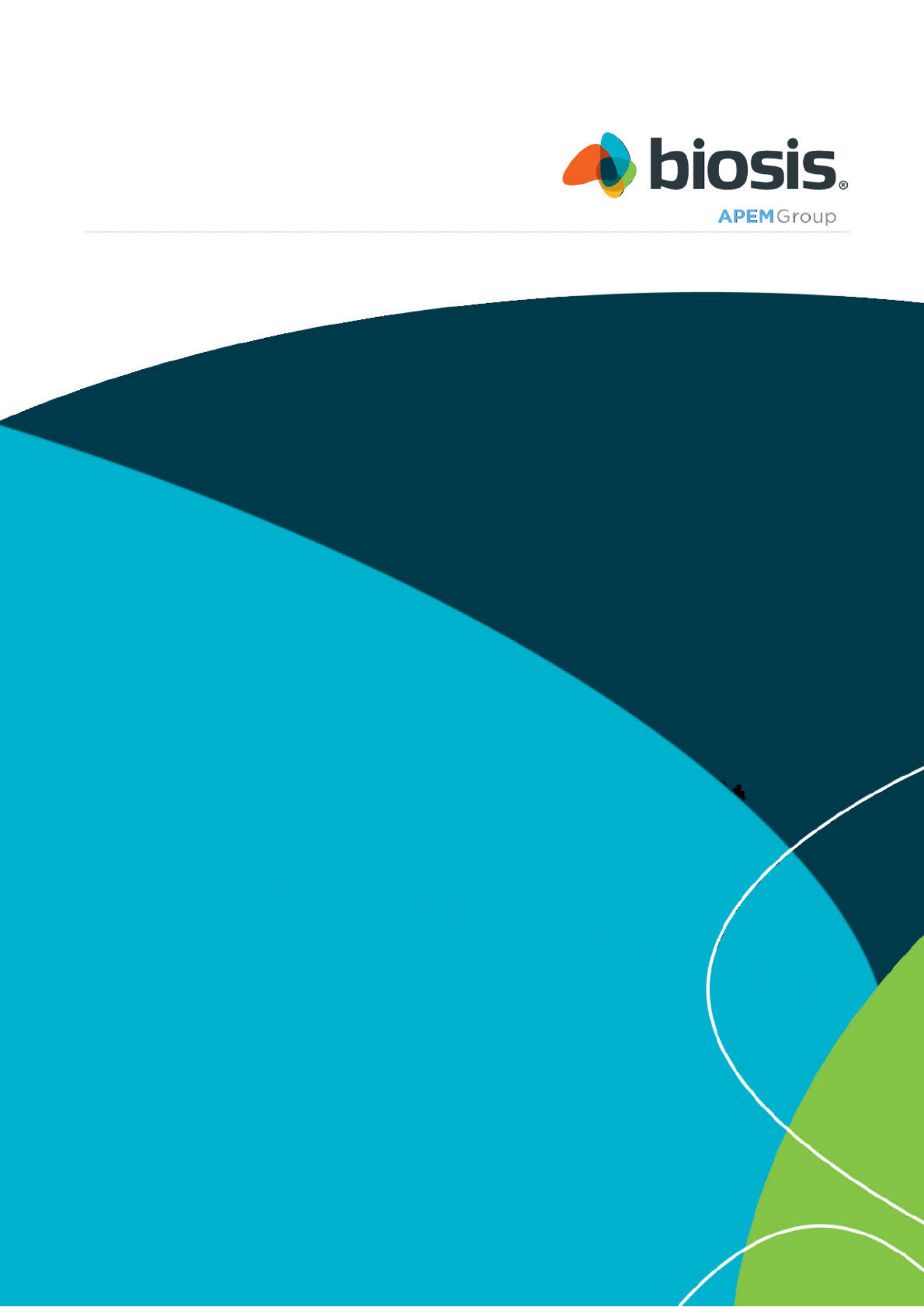
- This report has been developed using the most recent spatial data available to Biosis, inaccuracies within the publicly available datasets may occur.
- It is likely that flora species that were not recorded during baseline surveys will be recorded at the site in future years as more monitoring is undertaken and different environmental/seasonal conditions are encountered (which will encourage the growth and flowering of different species).

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Appendix 7 Vegetation quality assessment results

Date	Habitat zone	EVC*	Natural Temperate Grassland?	Approx. area (ha)*	Under-storey	Lack of weeds	Recruit-ment	Organic litter	Site condition subtotal	Standardised site condition subtotal	Patch size	Neighbour-hood	Distance to core area	Landscape context subtotal	Total habitat score
November 2025	**1A**	132_61: PG	Yes	66.02	15	2	6	3	26	**35.45**	8	3	4	15	**50.45**
November 2025	**1B**	132_61: PG	Yes	0.75	5	2	3	2	12	**16.36**	8	3	4	15	**31.36**
November 2025	**2**	132_61: PG	Yes	1.71	5	2	6	2	15	**20.45**	1	2	3	6	**26.45**
November 2025	**3**	132_61: PG	Yes	1.25	5	2	3	2	12	**16.36**	1	2	3	6	**22.36**
November 2025	**15A**	132_61: PG	Yes	0.51	5	2	3	5	15	**20.45**	4	2	3	9	**29.45**
November 2025	**17A**	132_61: PG	Yes	1.54	5	2	3	2	12	**16.36**	1	2	3	6	**22.36**
November 2025	**21**	132_61: PG	Yes	4.58	5	2	3	2	12	**16.36**	2	2	3	7	**23.36**
November 2025	**Weighted Average**	**132_61: PG**	**Yes**	**76.35**	**13.64**	**2.00**	**5.66**	**2.88**	**24.19**	**32.99**	**7.20**	**2.87**	**3.87**	**13.95**	**46.93**

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Appendix L: Offsets Assessment Guide Calculator (Biosis 2026c)

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser

Matter of National Environmental Significance	
Name	Natural Temperate Grassland
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	6.8%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	Impact site: Sky Road impact area Weighted average VQA score of 29 73	Area	4 09	Hectares	
			Quality	3	Scale 0-10	
			Total quantum of impact	1 23	Adjusted hectares	
Threatened species habitat						
Area of habitat	No		Area			
			Quality			
			Total quantum of impact	0 00		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e g Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e g Change in nest success	No					
Mortality rate e g Change in number of road kills per year	No					
Number of individuals e g Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																					
Area of community	Yes	1 23	Adjusted hectares	Current Natural Temperate Grassland of [redacted]	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	14 26	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0 00	90%	0 00	0 00	1 33	108 35%	Yes		
									Future area without offset (adjusted hectares)	14 3	Future area with offset (adjusted hectares)	14 3									
					Time until ecological benefit	10	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	6	2 00	90%	1 80	0 93					
Threatened species habitat																					
Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset										
									Future area without offset (adjusted hectares)	0 0	Future area with offset (adjusted hectares)	0 0									
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**		**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e g Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e g Change in nest success	No																				
Mortality rate e g Change in number of road kills per year	No																				
Number of individuals e g Individual plants/animals	No																				

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0 00		$0 00
Mortality rate	0				$0 00		$0 00
Number of individuals	0				$0 00		$0 00
Number of features	0				$0 00		$0 00
Condition of habitat	0				$0 00		$0 00
Area of habitat	0				$0 00		$0 00
Area of community	1 227	1 33	108 35%	Yes	$0 00	N/A	$0 00
					$0.00	**$0.00**	**$0.00**

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