Australian Government

Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Western Sydney International (Nancy-Bird Walton) Airport – Airspace and flight path design

Environmental Impact Statement

Technical paper 7: Landscape and visual amenity

October 2024

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Terms and abbreviations

Term/abbreviation	Definition
Airport Plan	The approved Western Sydney Airport Plan
Amenity	'*The pleasantness of a place as conveyed by desirable attributes including visual, noise, odour etc'* (Australian Institute of Landscape Architects QLD 2018)
DCCEEW	Australian Government Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DITRDCA	The Department of Infrastructure, Transport, Regional Development, Communications and the Arts
DMP	Destination Management Plan
EIS	Environmental Impact Statement
GBMA	Greater Blue Mountains Area (World Heritage and National Heritage Place)
Glare	'Condition of vision in which there is discomfort or a reduction in ability to see, or both, caused by an unsuitable distribution or range of luminance, or to extreme contrasts in the field of vision.' (AS4282:2019)
Landowners	People who own properties/land
Landscape	*'All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure.*' (TfNSW 2020)
Landscape and visual study area	Refers to the landscape surrounding the WSI project area that may be impacted by the preliminary WSI airspace and flight path design
Landscape character	The … '*combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place'*. (TfNSW 2020)
Landscape character zone	*'An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby*.' (TfNSW 2020)
LEP	Local Environmental Plan
LGA	Local Government Area
LiDAR	Light Detection and Ranging
LSPS	Local Strategic Planning Statement
LTOP	Long-Term Operating Plan
Magnitude of change	Magnitude [of change] is the … '*measurement of the scale, form and character of a development project when compared to the existing condition. In the case of visual assessment this also relates to how far the project is from the viewer*.' (TfNSW 2020)
MRA	Metropolitan Rural Area
NSW NPWS	NSW National Parks and Wildlife Service

Term/abbreviation	Definition
(the) project	The Western Sydney International (Nancy-Bird Walton) Airport (WSI) Airspace and Flight Path Design (the 'proposed action')
Sense of place	The intangible qualities and character of a place, interpreted and valued by people
Sensitivity	'Susceptibility of a landscape or receptor to accommodate change without losing valued attributes.' (Australian Institute of Landscape Architects QLD 2018) The sensitivity of a landscape character zone or view is '*its capacity to absorb change*'. (TfNSW 2020)
Sky glow	*'The brightening of the night sky that results from radiation (visible and non-visible), scattered from the constituents of the atmosphere (gaseous, molecules, aerosols and particulate matter), in the direction of observation.*' It comprises Natural sky glow and artificial sky glow. (AS4282:2019)
Spill light	*'Light emitted by a lighting installation that falls outside of the design area. Spill light may or may not be obtrusive depending on what it affects'* (AS4282:2019)
TfNSW	Transport for New South Wales
Values	*'Any aspect of landscape or views people consider to be important. Landscape and visual values may be reflected in local, state or federal planning regulations, other published documents or be established through community consultation and engagement, or as professionally assessed.'* (Australian Institute of Landscape Architects QLD 2018)
View	'*Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features.*' (Australian Institute of Landscape Architects QLD 2018)
Viewpoint	'*The specific location of a view, typically used for assessment purposes*.' (Australian Institute of Landscape Architects QLD 2018)
Visual absorption capacity	'*The potential for a landscape or scene to absorb a particular change without a noticeable loss of valued attributes*.' (Australian Institute of Landscape Architects QLD 2018)
WSI	The Western Sydney International (Nancy-Bird Walton) Airport

Executive summary

Introduction

The Western Sydney International (Nancy-Bird Walton) Airport (WSI) location at Badgerys Creek in Western Sydney was announced by the Australian Government in 2014. WSI would be a 24-hour airport capable of handling domestic, international and freight services to cater for growing demand for air travel in a convenient part of the Western Sydney growth corridor.

The development of a greenfield airport at Badgerys Creek was the subject of an Environmental Impact Statement (2016 EIS). Following the finalisation of the 2016 EIS, the Western Sydney Airport – Airport Plan (Airport Plan) was approved in December 2016. The Airport Plan authorised the construction and operation of the Stage 1 Development. It also set the requirements for the further development and assessment of the preliminary airspace design for WSI.

Pursuant to section 161 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) is the designated proponent for the project and is responsible for leading the airspace design for the proposed airspace arrangements for single runway operations at WSI. Following the environmental assessment and community consultation process, Airservices Australia are responsible for the detailed design of the flight paths, with support from DITRDCA.

The project is the development and implementation of preliminary flight paths and a new controlled airspace for single runway operations at WSI and has been developed on the requirement for WSI to operate 24-hours, 7 days a week. The project also includes the associated air traffic control and noise abatement procedures, runway modes of operation and facilitated and flight path design changes.

This technical paper is one of a number of technical papers that inform the Environmental Impact Statement (EIS) for the WSI airspace and flight path design ('the project'). The purpose of this technical paper is to identify and assess the potential impacts of the project in relation to landscape character and visual impacts. It responds directly to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) guidelines and has been prepared with consideration of relevant legislation and guidance for environmental impact assessment, including matters of landscape and visual value.

To understand the potential landscape character and visual impacts resulting from the project, the assessment considered a range of scenarios including the operation of the new runway in the early years (2033) and when WSI's single runway is expected to operate near capacity (2055).

This assessment considers the potential impacts of the project on landscape character and visual amenity, using a representative viewpoint approach. This includes consideration of the impact of airspace activity during day and night time hours. This assessment considers the landscapes and views of Western Sydney and also of the Blue Mountains, including impacts on the aesthetic values of the Greater Blue Mountains Area (GBMA) World Heritage property. No construction works or changes to the physical ground infrastructure approved and currently under construction are required for the project.

Legislation/policy/guidelines

This assessment responds directly to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) guidelines and has been prepared with consideration of relevant legislation and guidance for environmental impact assessment, including matters of landscape and visual value, including The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (2013), Significant Impact Guidelines 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies (2006), The Convention Concerning the Protection of World Cultural and Natural Heritage, and *Greater Blue Mountains World Heritage Area Strategic Plan 2009*, numerous State, regional and local plans.

Existing environment

The study area for this technical paper comprises 2 geographic areas. An area of about 15 kilometres (km) from WSI, covering the areas of western Sydney where the preliminary flight paths are at lower altitudes and at higher frequencies. In this area plane movements are likely to be more visually prominent and more likely to affect landscape character and visual amenity. Western Sydney is intended to undergo substantial land use change and will be transformed into a new city associated with WSI.

Beyond this, the study area expands to about 50 km northwest, west and southwest to consider the potential landscape character and visual impacts on the Blue Mountains. In this area, the landform rises and the landscape character and visual amenity values are more sensitive to change caused by development. This landscape includes national parks, urban areas and large swathes of the GBMA.

Assessment methodology

A range of guidance is available for the assessment of landscape and visual impact. However, specialists undertaking landscape and visual assessments typically refer to the following guidance:

- *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, Transport for NSW, 2020
- *The Guidance Note for Landscape and Visual Assessment*, Australian Institute of Landscape Architects Queensland, 2018
- *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management & Assessment.

The methodology prepared for this assessment draws upon the guidance in these documents.

These guidelines differentiate between landscape character and visual impact assessment. The Guideline for Landscape Character and Visual Impact Assessment EIA-NO4 describes the difference …'*landscape character impact assessment—the assessment of impact on the aggregate of an area's built, natural and cultural character or sense of place and visual impact assessment—the assessment of impact on views*'. (p.4 TfNSW 2020)

Identified landscape and visual impacts

Landscape character impacts – Western Sydney

There would be **moderate** landscape character impacts on the Luddenham village and agricultural (LCZ4) and South Penrith Urban area (LCZ11) which are close to WSI in the 2033 scenario. During the 2055 scenario, the level of impact on the Luddenham village and agricultural landscape character zone (LCZ4) would increase to **high-moderate** (LCZ4), due to the increase in flight frequency. The level of impact, at the South Penrith Urban area (LCZ11) would continue to be **moderate**, as the increase in overflights would not be as great.

In the 2033 scenario there would be a **moderate-low** landscape character impact on the Penrith south-east rural transition (LCZ2), Greendale and Silverdale rural and residential (LCZ3), Kemps Creek and Rossmore rural residential (LCZ8), Aerotropolis Core precinct (LCZ9) and Western Sydney Parklands (LCZ12) LCZs. During the 2055 scenario, the level of impact on 3 of these LCZs would increase to **moderate**, including the Penrith south-east rural transition (LCZ2), Greendale and Silverdale rural and residential (LCZ3), and Western Sydney Parklands (LCZ12), due to the increasing overflights. The level of impact to the remaining 2 LCZs, Kemps Creek and Rossmore rural residential (LCZ8) and Aerotropolis Core precinct (LCZ9), would continue to be **moderate-low** during the 2055 scenario as the increased flights would be more compatible with the future character of these areas.

There would be a **low** landscape character impact on the Penrith rural south-west (LCZ1) and Northern Gateway precinct (LCZ5) in the 2033 scenario. In the 2055 scenario, the level of impact would increase for the Penrith rural south-west (LCZ1) to **moderate-low** (LCZ1), due to the due to the increase in flight frequency. The level of impact would remain as a **low** landscape character impact for the Northern Gateway precinct LCZ (LCZ5).

There will be **negligible** landscape character impacts on the WSI landscape character zone (LCZ6) and Badgerys Creek (LCZ7) landscape character zones in the 2033 and 2055, due to the very low sensitivity of these landscape character zones. There would also be a **negligible** landscape character impact on the Leppington rural residential (LCZ10) in the 2033 and 2055 scenarios due to the limited extent of flight paths over this area.

Visual impacts – Western Sydney

Of the 8 public domain views assessed, there were 3 locations where there would be a visual impact due to flights in the 2033 scenario. This includes **moderate** visual impacts to the recreational view from George Maunder Lookout at Prospect Reservoir (VP2) which has an elevated vantage point, and also from Kemps Creek (VP4) and Luddenham Village (VP5), which are in close proximity to the airport.

During the 2055 scenario, the level of impact in views from George Maunder Lookout at Prospect Reservoir (VP2) would continue to be **moderate**, as the increased flights would be absorbed into this expansive view. There would, however, be an increase to the impacts from Kemps Creek (VP4) and Luddenham Village (VP5) to **high-moderate**, due to the increased frequency of flights, seen in close proximity.

At the remaining 5 locations chosen as representative viewpoints, there would be **moderate-low** visual impacts during the 2033 scenario, including in views from Orchard Hills (VP1), Walworth Road Horsley Park (VP3), Silverdale Road Orangeville (VP6), Kalangara Road, Silverdale (VP7) and Warrangamba Lookout (VP8). These locations are more distant from the WSI runway and include some elevated vantage points. During the 2055 scenario, the level of impact would increase to **moderate** from the View from Silverdale Road, Orangeville (VP6) and the Warrangamba Dam lookout (VP8), which are both located to the southwest of WSI and would experience a similar increase in flight activity. At the remaining 3 view locations, the view from Orchard Hills (VP1), Walworth Road, Horsley Park (VP3) and Kalangara Road Silverdale, VP7), the level of visual impact would continue to be **moderate-low**.

Night time visual impacts – Western Sydney

There would be **negligible** visual impact on views from areas of high district brightness (A4) as the lighting from aircraft would not contrast substantially with these brightly lit landscapes at night. There would be a **moderate-low** visual impact on the medium district brightness landscapes (A3) of Western Sydney, as the lighting from flights would contrast with the existing night sky over these areas.

Landscape character impacts – The Blue Mountains

During the 2033 and 2055 scenarios, there would be **high-moderate** landscape character impact on the Blue Mountains iconic features LCZ (LCZ13), a **moderate** landscape character impact on the Blue Mountains forested hills and valleys LCZ (LCZ14) and a **moderate-low** landscape character impact on the Blue Mountains township spine LCZ (LCZ15). While the introduction of multiple high altitude and low frequency flights would result in a low magnitude of change to each of these LCZs, the variation in landscape sensitivity influences the resulting level of impact.

During the 2055 scenario there would continue to be a **high-moderate** landscape character impact on the Blue Mountains iconic features LCZ (LCZ13) and a **moderate-low** landscape character impact on the Blue Mountains township spine LCZ (LCZ15) as in most cases the increase in flights would not be to a level that increases the impact on these character areas as a whole. For the Blue Mountains forested hills and valleys LCZ (LCZ14), however, the increase in flight frequency during the 2055 scenario would be such that there would be a **high-moderate** landscape character impact.

Visual impacts – The Blue Mountains

Views from lookouts

Of the 8 views assessed, there would be a **high-moderate** visual impact during the 2033 scenario, in views from Walls Lookout (VP14) and Echo Point lookout (VP15). This impact is due to the very high sensitivity of these views and the introduction of flights that would be perceptible, moving across the view. This **high-moderate** visual impact would continue as flight frequency increases in the 2055 scenario. These impact levels would remain unchanged as while the flight frequency increases, the flights are generally at higher altitudes and would continue to be seen intermittently, so this impact level would be experienced more frequently, rather than with a greater magnitude of change at any one time.

There would otherwise be a **moderate visual impact** in views from Burragorang Lookout (VP9), The Rock Lookout (VP10), Wynnes Rocks Lookout (VP13) and Clearys Memorial Lookout (VP16) during the 2033 scenario, where the sensitivity of the view is less. For the and Burragorang Lookout (VP9) this impact would increase to **high-moderate** due to the increase in flight frequency, at relatively low altitudes, The remaining views (VP10, 13, and 16), would remain as **moderate** impact as the flight frequency increases, as the flights are generally at higher altitudes and would continue to be seen intermittently.

There would also be a **moderate-low** visual impact in the view from the Hawkesbury Lookout, during the 2033 and 2055 scenarios. This view has an urban outlook and a moderate sensitivity, allowing it to absorb the aircraft activity with less of an impact.

Views from campgrounds

From campgrounds and day-use areas within the Blue Mountains there would be a **moderate** visual impact during the 2033 scenario, as views of planes overhead would not be highly visible, but if seen overhead, would detract from the amenity of views. The impact level would remain as **moderate** during the 2055 scenario as the increased flight frequency would increase the occurrence of this impact, rather than increase the scale of the impact.

Views from scenic routes

There would be a **moderate-low** visual impact experienced in the views from scenic routes within the Blue Mountains, including the Great Western Highway and Bells Line of Road, during the 2033 and 2055 scenario. These impacts would be intermittent and experienced particularly in locations where the flights pass over and across these views.

Night time visual impacts – Blue Mountains

There would be a **low** visual impact in the areas of medium district brightness (A3) at night, and a **moderate-low** visual impact from the Linden Observatory. This is due to the low frequency of flights and high altitude of planes over these areas. There would be a **negligible** visual impact on the intrinsically dark landscapes of the Blue Mountains (A0) as the project lighting would be experienced across a small portion of these landscape due to limited public access in these areas at night.

Cumulative impacts

While the assessment contained in this technical paper has anticipated the planned land use changes in areas surrounding WSI as the baseline for landscape character and views, and sensitivity of future potential receivers over the time horizons assessed, there are some potential cumulative effects on landscape character and visual amenity.

Landscape character

There would be cumulative effects on several landscape character zones near the airport, where there would be a greater concentration of flights and flights at lower altitudes. This includes the Penrith south-east rural transition Landscape Character Zone (LCZ2), Greendale and Silverdale rural and residential landscape (LCZ3), and Luddenham village and agricultural precinct (LCZ4), where the land use change together with increased airspace activity would transform the character of the landscape.

Views

Cumulative visual impacts are likely to occur where views are seen in proximity to current and future large-scale infrastructure projects and ongoing strategic growth centre development areas in Western Sydney. This changing visual setting has been considered in the visual impact assessment as a changing baseline condition. Noting, there would be a cumulative effect on views from Luddenham village, Silverdale and Orangeville to the west of the airport, and Orchard Hills to the north, where the transformation of the landscape character of the land would be seen together with changes to the character of the sky due to increasing airspace activity.

There would also be a cumulative effect on views from recreational areas to the east of the airport, including George Maunder Lookout at Prospect Reservoir, where there would potentially be views to the development in areas surrounding the reservoir and increasing flights in the airspace seen in this elevated view.

Blue Mountains

Landscape character

There would be cumulative effects on the landscape character zones across the Blue Mountains are increasingly influenced by air traffic, both from WSI and other airports within the Sydney basin. The assessment of impacts, in this assessment, the baseline sensitivity has not changed. These cumulative effects may occur where there are increased flights at other airports within the Sydney Basin flying over the Blue Mountains Landscape character zones (LCZ13 Blue Mountains iconic features, LCZ14 Blue Mountains forested hills and valleys and LCZ15 Blue Mountains township spine).

Views

There is the potential for a cumulative effect on views from lookouts (including Echo Point and Walls Lookout, for example) campgrounds and scenic routes throughout the Blue Mountains as flight frequency increases and flights related to other airports in the region have the potential to be seen in these views.

Interactive effects

There would be interactive effects between noise and visual, as often aircraft is heard before it is seen, and hearing aircraft increases the perception of its prominence or level of intrusion upon a view or the character of an area. There is the potential for interactive effects between noise, landscape character and visual impact in all locations where a landscape character or visual impact has been identified. Natural locations, such as the Blue Mountains, would be particularly sensitive to the interactive effect of noise together with landscape character and visual impact.

There is also the potential for interactive effects between aboriginal cultural heritage and European cultural heritage, where the values of these places rely on landscape character or views, particularly where these places offer views to the sky.

Conclusion

Generally, the landscape character of Western Sydney would be transformed by intended changes facilitated and planned for through a number of strategic planning projects. While there would be some landscape character and visual impacts, these would generally be of a moderate or lower impact level.

In the Blue Mountains there would be some high-moderate impacts on the landscape character of areas where there are iconic landscape features and nationally significant views to these landscape features. These impacts would occur in increasing frequency as the number of flights increases between the 2023 and 2055 operational scenarios.

In relation to the EPBC Significant Impact Guidelines 1.2, the project would not directly alter any natural landscape feature on the ground. However, the contribution of the sky to landscape character and its appreciation in views make the sky, in some locations, a landscape feature. This includes locations in the Blue Mountains where the expansive sky in views that are predominantly natural, would be altered, and in locations where the naturalness of the sky contributes to landscape character. This is the case in locations such as in the high and very high sensitivity landscape character zones and views within the Blue Mountains. In this regard, there is a real chance or possibility that the project would substantially alter the appreciation of the sky in views from viewpoints to the south of Katoomba, represented in this assessment by the view from Echo Point, and from lookouts along the Grose Valley, represented by the assessment of the view from Walls Lookout.

This alteration would be intermittent, would not be permanent, and is reversible.

EPBC Significant Impact Guidelines 1.2 – if you answer ‘yes’ to one or more of the questions below, then it would be expected that your action is likely to have a significant impact on the environment.

Environmental significance criteria
Impacts on landscapes and soils Is there **a real chance or possibility** that the action/project will: • substantially alter natural landscape features • cause subsidence, instability or substantial erosion • or involve medium or largescale excavation of soil or minerals?

Chapter 1 Introduction

1.1 Background

In 2016, the then Australian Minister for Urban Infrastructure approved development for a new airport for Western Sydney, now known as the Western Sydney International (Nancy-Bird Walton) Airport (WSI), under the *Airports Act 1996* (Commonwealth). The site of the new airport (the Airport Site) covers approximately 1,780 hectares (ha) at Badgerys Creek, as shown in Figure 1.1. The Airport Site is located within the Liverpool local government area (LGA).

Following the finalisation of the *Western Sydney Airport – Environmental Impact Statement* (2016 EIS), the Western Sydney Airport – Airport Plan (Airport Plan) was approved in December 2016. The Airport Plan authorised the construction and operation of the Stage 1 Development. It also set the requirements for the further development and assessment of the preliminary airspace design for WSI. The Australian Government has committed to developing and delivering WSI by the end of 2026.

The 2016 approval provided for the on-ground development of Stage 1 Development of WSI (a single runway and terminal facility capable of initially handling up to 10 million passengers per year) utilising indicative 'proof of concept' flight paths. These flight paths, presented in the 2016 EIS demonstrated that WSI could operate safely and efficiently in the Sydney Basin. WSI will be a 24-hour international airport and will:

- cater for ongoing growth in demand for air travel, particularly in the rapidly expanding Western Sydney region, as well as providing additional aviation capacity in the Sydney region more broadly
- provide a more accessible and convenient international and domestic airport facility for the large and growing population of Western Sydney
- provide long term economic and employment opportunities in the surrounding area
- accelerate the development of critical infrastructure and urban development.

The design and assessment process for the next phase of the airspace design (referred to as the preliminary airspace design) was set by Condition 16 of the Airport Plan. This included the future airspace design principles and the establishment of an Expert Steering Group. Key to these design principles was the need to minimise the impact on the community and other airspace users while maximising safety, efficiency and capacity of WSI and the Sydney Basin airspace. The airspace design must also meet the requirements of Airservices Australia and civil aviation safety regulatory standards.

Led by the Australian Government Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA), the Expert Steering Group has developed the preliminary flight paths and airspace arrangements for WSI (the project). The preliminary airspace design is the subject of the EIS.

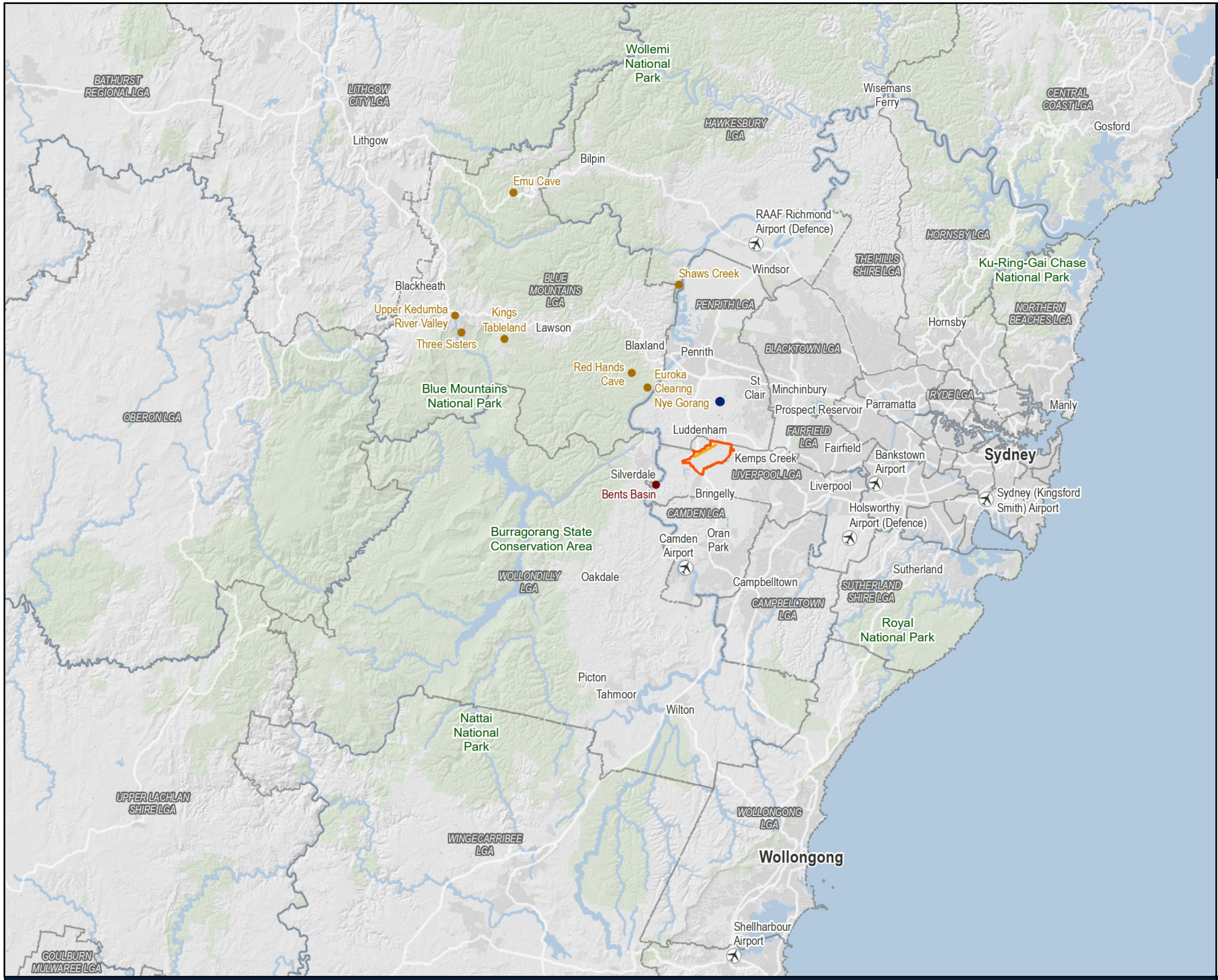


Figure 1.1

Regional Context of the Western Sydney International (Nancy-Bird Walton) Airport

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- State local government area (LGA)
- Orchard Hills Defence Establishment
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

0 10 20 km

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:750,000 Date: 27/06/2023

Data sources: - DITRDC, DCS, Geoscience Australia
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community

1.2 The Airport

The Stage 1 Development of WSI has been approved and is limited to single runway operations. It will handle up to 10 million annual passengers and around 81,000 air traffic movements per year by 2033 including freight operations (a movement being a single aircraft arrival or departure). Single runway operations are expected to reach capacity at around 37 million annual passengers and around 226,000 air traffic movements per year in 2055.

The approval provides for the construction of the aerodrome (including the single runway), terminal and landside layout and facilities, and ground infrastructure such as the instrument landing systems and high intensity approach lighting arrays. Construction of the Stage 1 Development commenced in 2018. Figure 1.2 shows location of the single runway within the Airport Site.

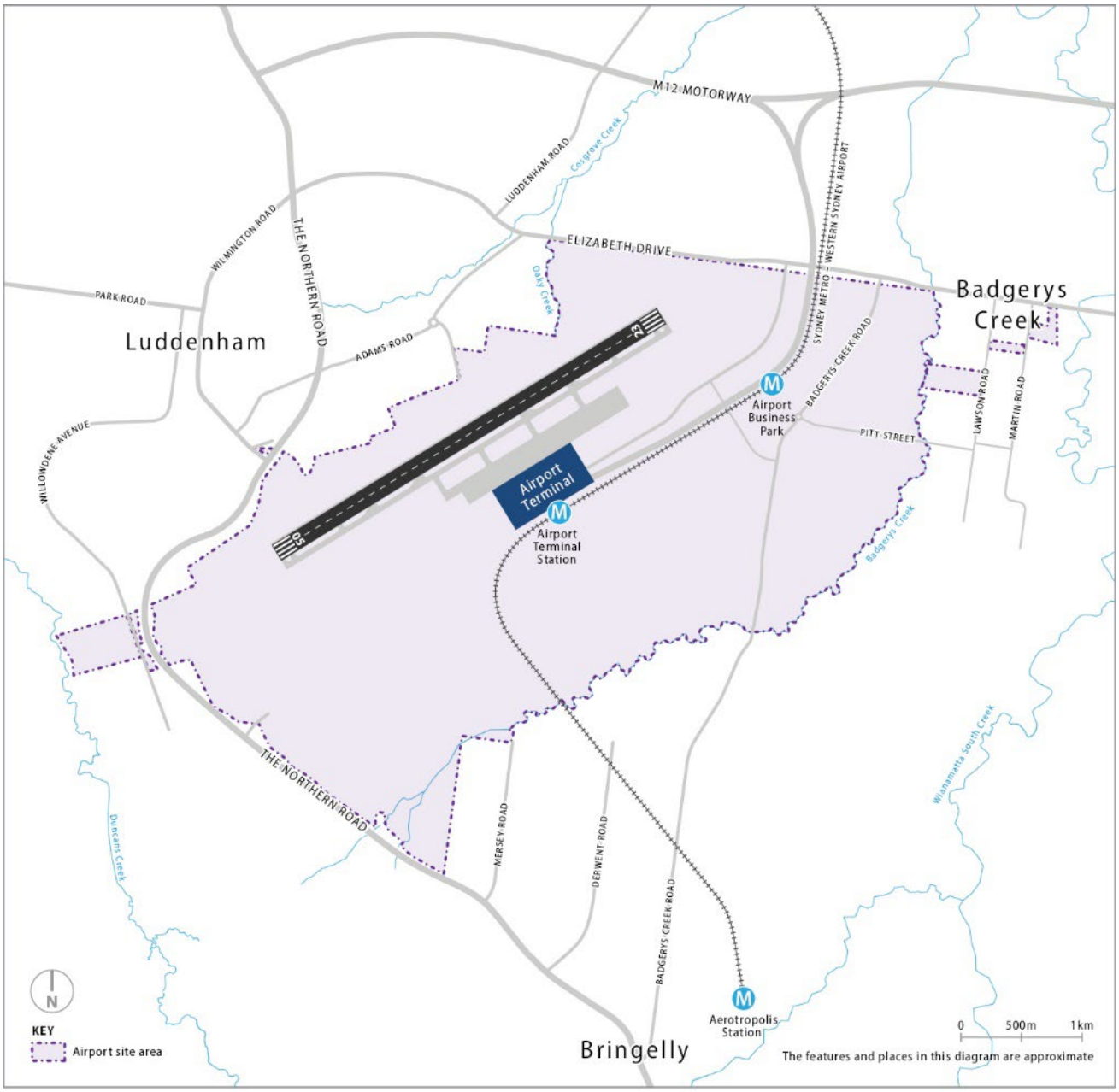


Figure 1.2 Western Sydney International Stage 1 Development

Chapter 2 Project description

The project consists of the development and implementation of preliminary flight paths and a new controlled airspace volume for single runway operations at WSI. The project also includes the associated air traffic control and noise abatement procedures for eventual use by civil, commercial passenger and freight aircraft. The airspace and flight paths would be managed by the Air Navigation Services Provider (ANSP), Airservices Australia.

The project involves preliminary flight paths for all-weather operations on Runway 05 and Runway 23 during the day (5:30 am to 11 pm) and night (11 pm to 5:30 am), as well as head-to-head Reciprocal Runway Operations (RRO) during night-time periods (when meteorological conditions and low flight demand permit) to minimise the number of residences subjected to potential noise disturbance.

The preliminary flight paths differ during the day and night. The preliminary flight paths at night differ to take advantage of the additional airspace capacity offered when the curfew for Sydney (Kingsford Smith) Airport is in force. The preliminary flight paths (as exhibited) are depicted in Figure 2.1 to Figure 2.5.

The project does not include any physical infrastructure or construction work.

Since the exhibition of the Draft EIS, refinements to the project have been incorporated into the preliminary flight path design. The final preliminary flight path design is presented in Chapter 7 (The Project) of the EIS.

2.1 Objectives of the project

The overall objectives for WSI are to:

- improve access to aviation services for Western Sydney
- resolve the long-term aviation capacity constraints in the Sydney Basin
- maximise the economic benefit for Australia by maximising the value of the Airport as a national asset
- optimise the benefit of WSI for employment and investment in Western Sydney
- deliver sound financial, environmental and social outcomes for the Australian community.

The project will assist in achieving these overall objectives as it would enable single runway operations to commence at WSI through the introduction of new flight paths and a new controlled airspace volume.

The Western Sydney Airport Plan sets out 12 airspace design principles that the design process is required to follow. The principles were informed by and reflect community and industry feedback on the 2016 EIS. The principles seek to maximise safety, efficiency and capacity, while minimising impacts on the community and the environment. For further information on the airspace design principles refer to Chapter 6 (Project development and alternatives) in the EIS.

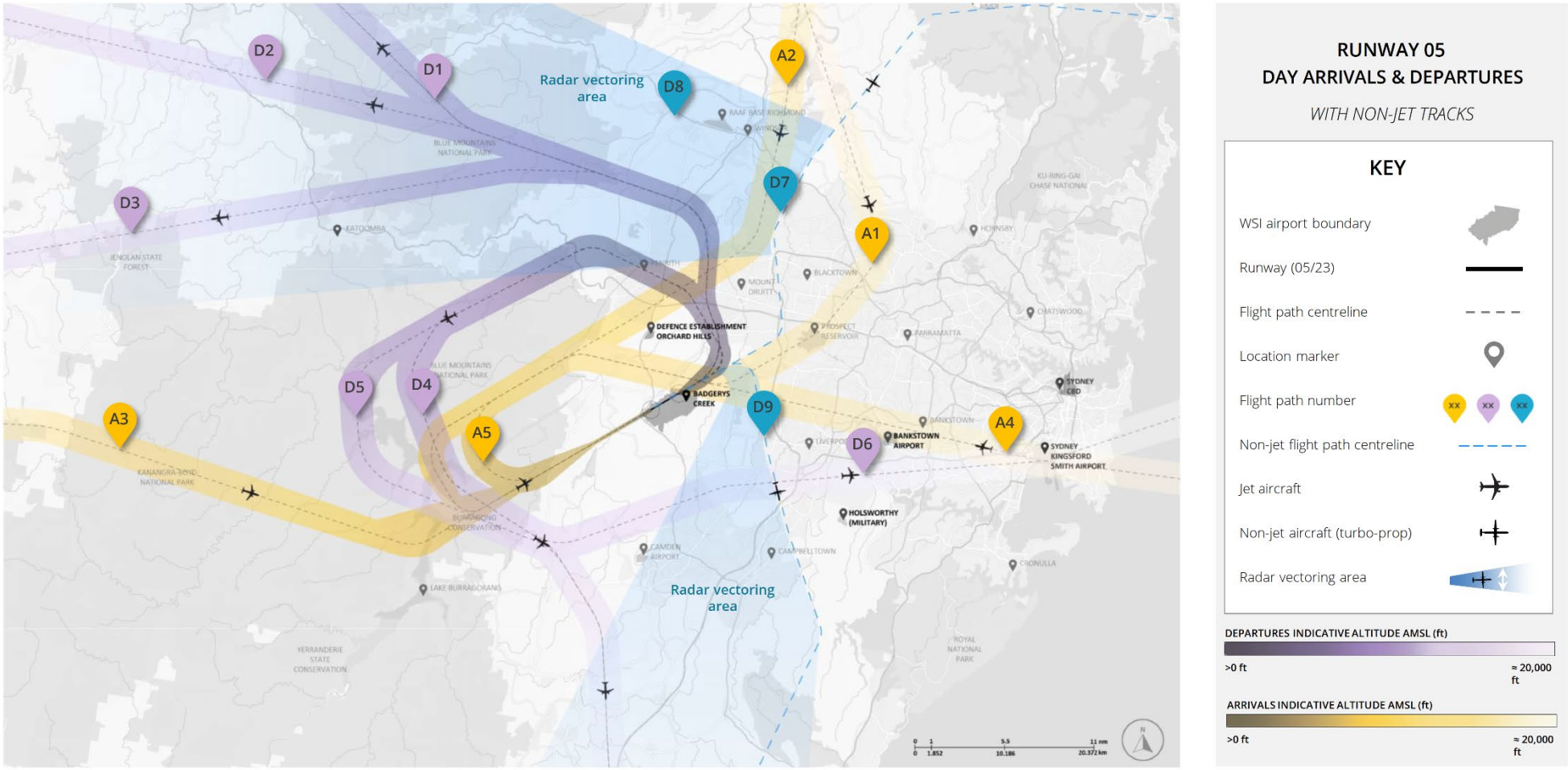


Figure 2.1 Proposed flight paths for Runway 05 (day)

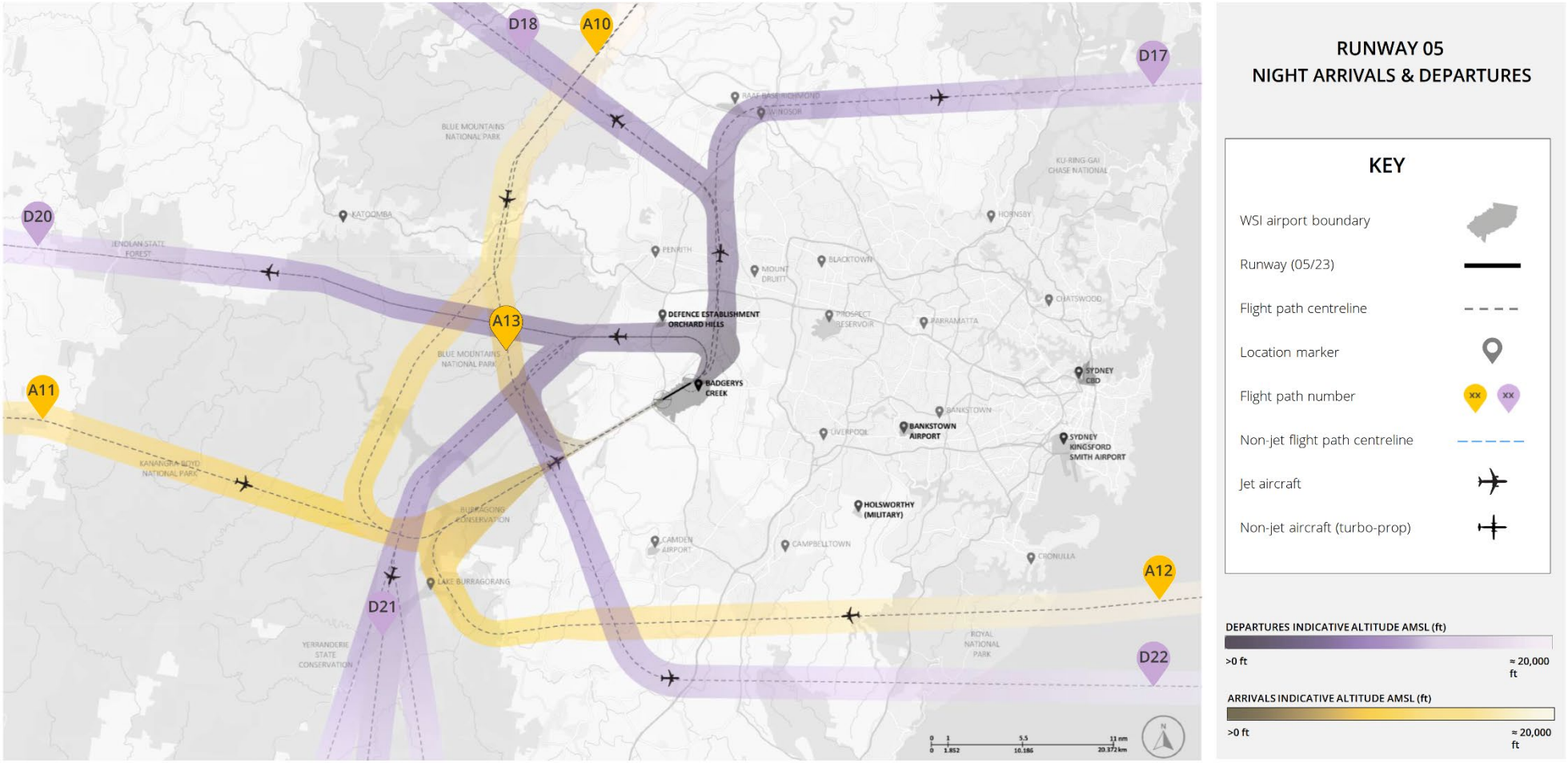


Figure 2.2 Proposed flight paths for Runway 05 (night)

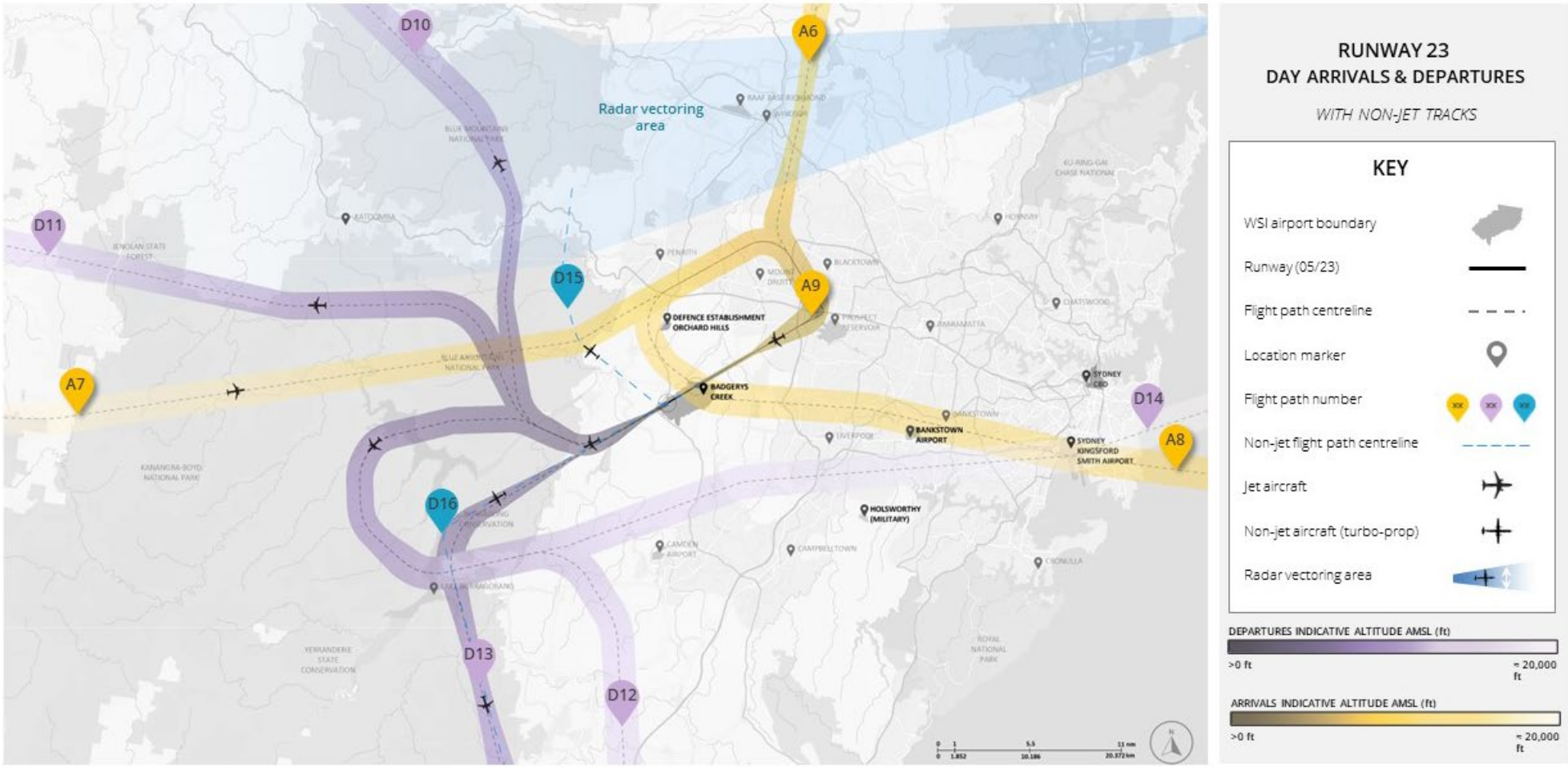


Figure 2.3 Proposed flight paths for Runway 23 (day)

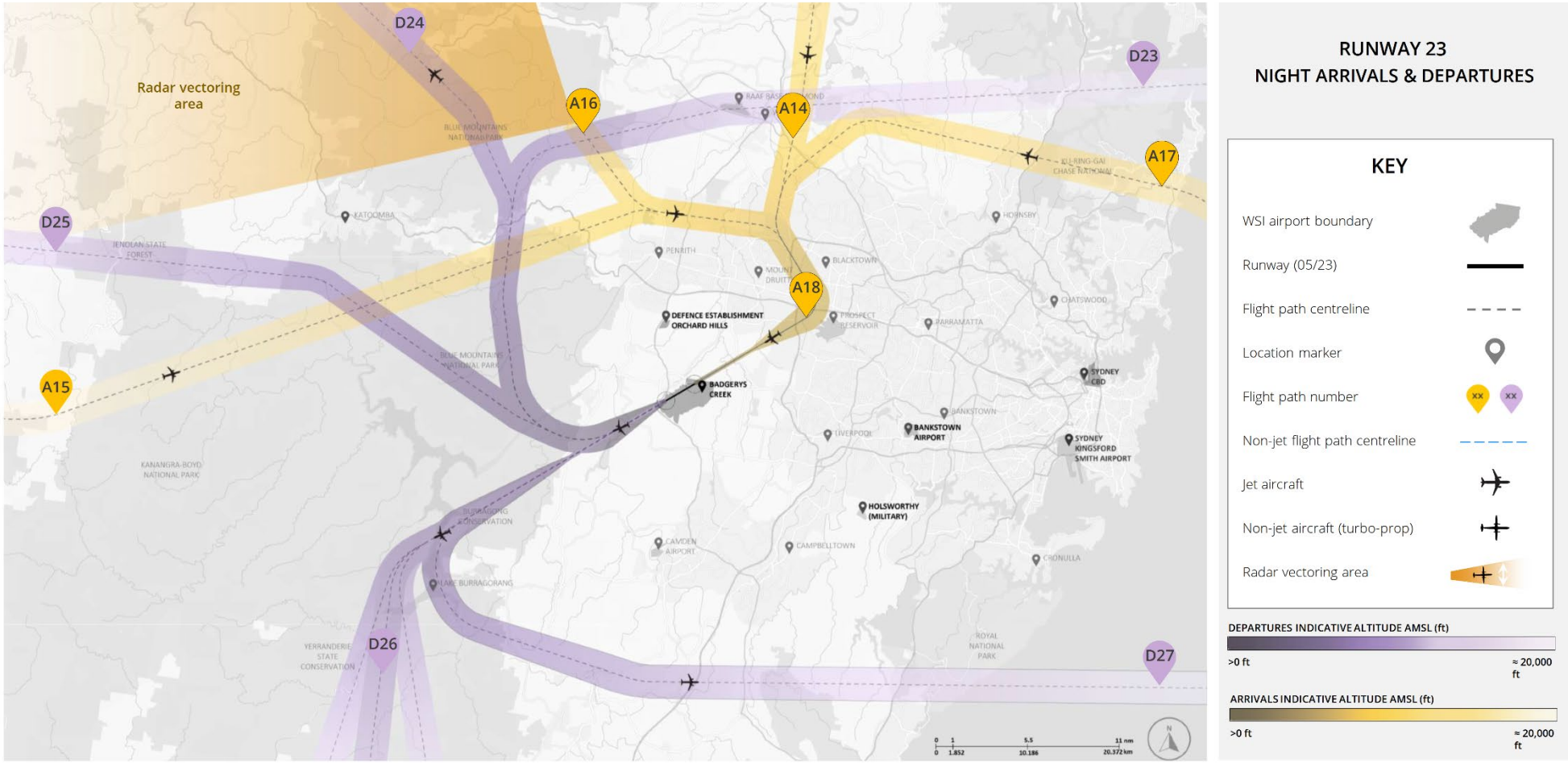


Figure 2.4 Proposed flight paths for Runway 23 (night)

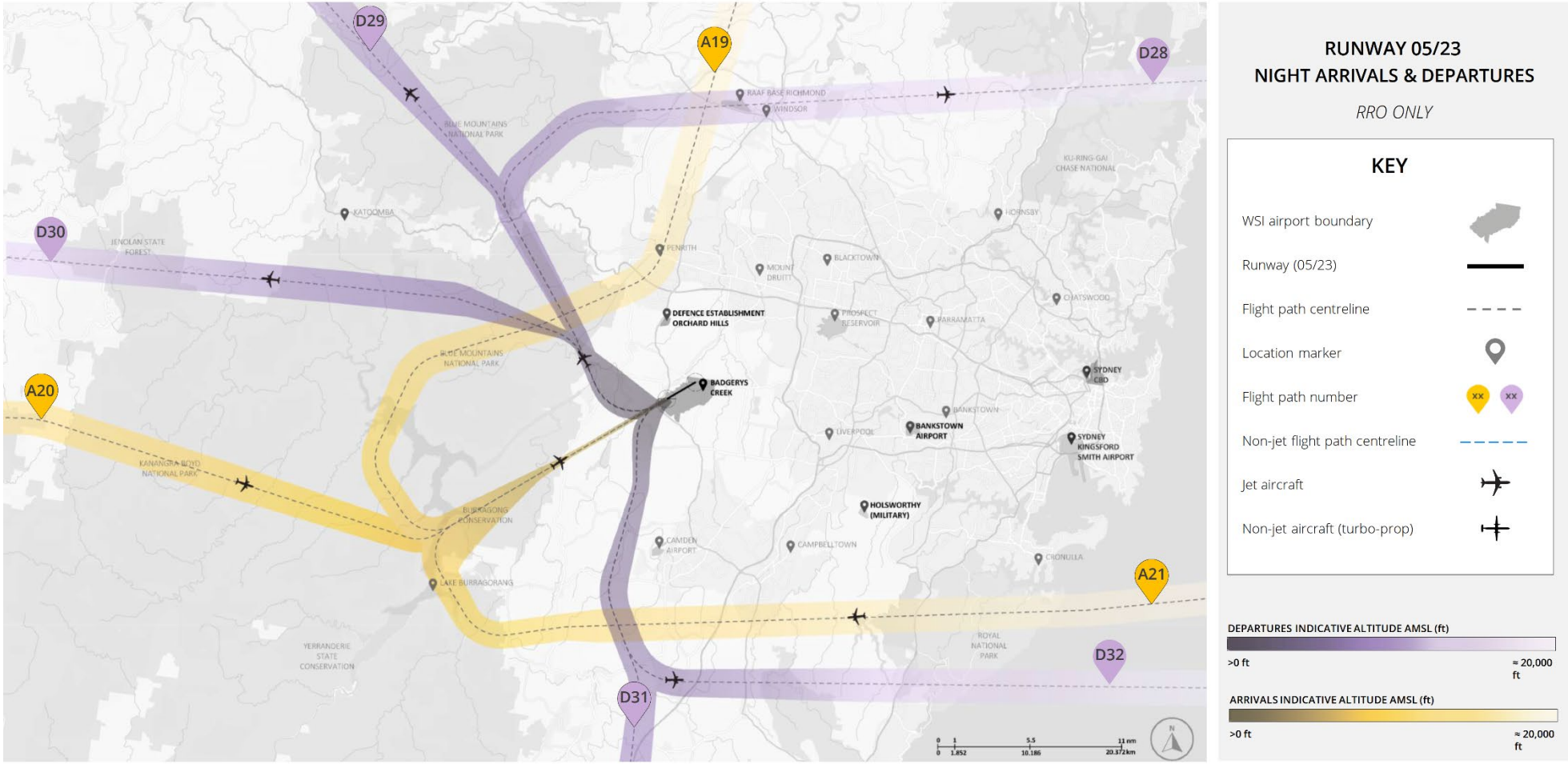


Figure 2.5 Proposed flight paths for Runway 05/23 (night)

Chapter 3 Purpose

3.1 Purpose of this technical paper

This technical paper is one of a number of technical papers that inform the Environmental Impact Statement (EIS) for the WSI airspace and flight path design ('the project').

The purpose of this technical paper is to identify and assess the potential impacts of the project in relation to landscape character and visual impacts. It responds directly to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) guidelines (refer to Section 3.2) and has been prepared with consideration of relevant legislation and guidance for environmental impact assessment, including matters of landscape and visual value, including:

- The EPBC Act:
  - Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (2013)
  - Significant Impact Guidelines 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies (2006).

Further information on these documents and their application to the methodology is detailed in Chapter 6.

As identified in Chapter 2 refinements to the project have been incorporated into the preliminary flight path design. The assessment of these changes has been presented in Appendix G (Assessment of the refinements to the project) of the EIS.

3.2 EIS guidelines

The EIS guidelines specific to this assessment and where they are addressed in this technical paper are outlined in Table 3.1.

Table 3.1 Minister's guidelines

Reference	Requirement	Where addressed in this technical paper
6.0 Description of the environment	The EIS must include a description of the environment, land uses and character of the proposal site and the surrounding areas that may be affected by the action. It must include the following:	
	a. A general description of the environment on the Airport Site. Include a brief statement on the current status of on-ground construction works, including ground activities and aeronautical infrastructure to manage aircraft operations, and the expected state of the site upon commencement of the proposed action.	Chapter 5
	b. A general description of the environment in surrounding areas that may be affected by the proposed action. This should include details of current and historical land use of the area, and proposed urban, industrial, rural and tourism activities within areas that may be affected by the proposal.	Chapter 5 and Chapter 7
	c. Identify any places with heritage value, as a component of the whole of the environment, in areas relevant to the impacts of the action.	Chapter 4 and Chapter 7

Reference	Requirement	Where addressed in this technical paper
	d. A description of the environment in all areas of potential impact, including all components of the environment as defined in Section 528 of the EPBC Act: – the qualities and characteristics of locations, places and areas.	Chapter 5 and Chapter 7
7.3 Relevant impacts – Heritage	Detailed assessment of any likely impact that the proposed action may facilitate on the natural, cultural, heritage and socio-economic values of the GBMA, and any other World Heritage properties or National Heritage places identified as relevant to the impacts of the proposed action. Include explicit assessment against the Outstanding Universal Value, including the integrity of the property. This should be based on (but is not limited to) the following: • Visual assessment of representative viewpoint locations and visual amenity impact on tourist drives	Chapter 8

3.3 Structure of this technical paper

The structure and content of this technical paper is as follows:

- Chapter 1– Introduction: Outlines the background and need for the project.
- Chapter 2 – Project description: Describes the nature of the project in the context of WSI.
- Chapter 3 – Purpose: Provides an outline of the purpose.
- Chapter 4 – Legislative and policy context: Provides an outline of the key legislative requirements and policy guidelines relating to the project.
- Chapter 5 – Existing conditions: Describes the existing conditions of the site and surrounds, including the topography, landscape features, sensitivities, and a general description of the visibility of the project.
- Chapter 6 – Methodology: Provides an outline of the methodology used for the preparation of this technical paper.
- Chapter 7 – Landscape impact assessment: Describes the potential landscape impacts associated with the project.
- Chapter 8 – Visual impact assessment: Describes the potential visual impacts associated with the project during the day and at night.
- Chapter 9 – Impact on the GBMA landscape values: Describes the potential impacts on the world heritage values associated with the project.
- Chapter 10 – Cumulative impacts: Outlines the potential cumulative impacts with respect to other known developments within the vicinity of the project.
- Chapter 11 – Management and mitigation measures: Outlines the proposed mitigation measures for the project.

Chapter 4 Legislative and policy context

The following chapter provides a brief review of the international, commonwealth, state government and local authority legislation and policy documents which provide guidance for the management of landscape character and visual amenity values relevant to the landscape and visual study area.

4.1 Commonwealth planning framework

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a legal framework to protect and manage nationally and internationally important natural and heritage places—defined in the EPBC Act as matters of national environmental significance, including the Greater Blue Mountains Area , which is included on the World Heritage List and the National Heritage List for its Outstanding Universal Value, meeting 2 World Heritage criteria (ix) and (x) (UNESCO, 2000).

The Significant Impact Guidelines 1.2 state in relation to impacts on landscapes and soils that a significant impact includes an impact that has "…*a real chance or possibility that the action will: … substantially alter natural landscape features*".

This consideration has been incorporated into the method for determining the magnitude of change and impact criteria for this assessment, so that any change associated with the project that would substantially alter the natural landscape features (if any) will be deemed to constitute a high landscape and visual amenity risk.

Given that 'natural landscape features' are not defined in the EPBC Act, this assessment adopts the definition used in the *Wind Energy: Visual Assessment Bulletin* (NSW OEH, 2016):

> *'Key landscape features may include natural features such as a distinctive mountain peak or hill top, a large rock outcrop or cliff, a waterfall, a visually distinctive stand of trees, or even a single large tree that stands out visually in the scene'.*

Appendix A of the Significant Impact Guidelines 1.2 includes a list of questions to assist in identifying the environmental and, in this case, landscape context of the landscape and visual study area. Although this list is not exhaustive, it states in relation to 'Landscapes and landforms' that the following questions be answered:

- *What landscape features or landforms are present?*
- *What landscape features or landforms are likely to be directly or indirectly impacted by the action?*
- *Are there any outstanding, rare, unusual, valuable or important landscape features or landforms?*

These questions are answered in the description of the existing conditions of the landscape and views, and in the impact assessment (refer to Chapter 5, Chapter 7 and Chapter 8). The sensitivity of the landscapes and views incorporates the consideration of any rare, unusual, valuable or important landscape features or landforms.

Appendix A of the Significant Impact Guidelines 1.2 also identifies issues to be considered in relation to people and communities, including: '*Will the action impact upon public amenity?*'. Public amenity includes, among other factors, visual amenity. This requirement will therefore be partially addressed in this assessment, in Chapter 8.

4.1.2 Convention Concerning the Protection of World Cultural and Natural Heritage

The *Convention Concerning the Protection of World Cultural and Natural Heritage* (UNESCO World Heritage Centre, 1972) aims to promote international cooperation to protect heritage that is of Outstanding Universal Value.

The Greater Blue Mountains Area (GBMA) was inscribed on the UNESCO World Heritage List in 2000, on biodiversity grounds, fulfilling 2 natural value criteria (criteria ix and x). The GBMA consists of over one million hectares of sandstone plateau, escarpments and gorges dominated by temperate eucalypt forest. Its exceptional biodiversity values are complemented by numerous other values, including indigenous cultural heritage values, wilderness, recreation and natural beauty. GBMA is also listed on the Australian National Heritage List (2005) for its biodiversity significance and is protected by Commonwealth and State legislation, including the EPBC Act.

The *Greater Blue Mountains World Heritage Area Strategic Plan* (NPWS, 2009) provides further information on the values of the GBMA, in relation to landscape character and visual amenity, and is summarised in the following section.

Assessment of the project against the World Heritage values criteria in relation to landscape character is provided in Chapter 9.

4.1.3 Greater Blue Mountains World Heritage Area Strategic Plan, 2009

This Strategic Plan (NPWS, 2009, and 2016 Addendum) provides the broad management principles for the area, and establishes the framework for the integrated management, protection, interpretation and monitoring of the values of the 8 reserves that comprise the GBMA.

Containing some of the '*most dramatic scenery in Australia*', the Strategic Plan lists the following values and attributes associated with the GBMA landscape:

- Scenic and aesthetic values:
  - Striking vertical cliffs and waterfalls, ridges and escarpments
  - 'Extensive caves' in the Jenolan Karst Conservation Reserve
  - 'Spectacular complex of narrow sandstone canyons and pagoda rock formations' (NPWS, 2009, page 17).
- Recreation and tourism values:
  - Vantage points on ridges and escarpments, offering 'outstanding vistas, from uninterrupted views of forested wilderness covered by natural vegetation to the contrasts of steep forested slopes surrounding cleared valleys'
  - 'Historic lookouts and walking tracks along the central Blue Mountains ridgeline'
  - 'Canyoning. Bushwalking, rock climbing, nature observation, scenic driving and photography are popular activities'.
- Wilderness values:
  - 'Extensive natural areas'
  - 'Opportunities for solitude and self-reliant recreation'
  - 'Unroaded except for management trails and largely free of exotic species'.

The Strategic Plan also notes: '*The GBMWHA's wilderness qualities have particular aesthetic value to local communities and park visitors alike. … Potential threats to the appreciation of the area's aesthetic values include inappropriate lighting as well as overflights by helicopters, low-flying jets and other aircraft*.'

Assessment of the project against the attributes associated with the GBMA landscape in relation to landscape character is provided in Chapter 9.

4.1.4 Blue Mountains National Park Plan of Management

One of the specific objectives for the Blue Mountains National Park (BMNP) (NSW NPWS, 2001) is:

> *'Protection and promotion of the outstanding scenic values of the park including protection of viewscapes from within and from outside the park'.*

BMNP is described as a 'popular destination for tourism and outdoor recreation because of its proximity to Sydney and the townships of the Blue Mountains as well as its outstanding natural features'. It states:

> *'The park is particularly well known for its scenic lookouts, walking tracks and opportunities for wilderness recreation and adventure activities'.*

Some important scenic features listed in BMNP include:

- scenic escarpment areas including the Jamison and Grose Valley cliffs, including the Three Sisters and Mount Banks
- canyons and pagoda rock formations in the Grose, Wollangambe and Bungleboori catchments
- igneous features of the Yerranderie area.

4.2 State and regional planning framework

4.2.1 The Greater Sydney Region Plan – 'A Metropolis of Three Cities', 2018

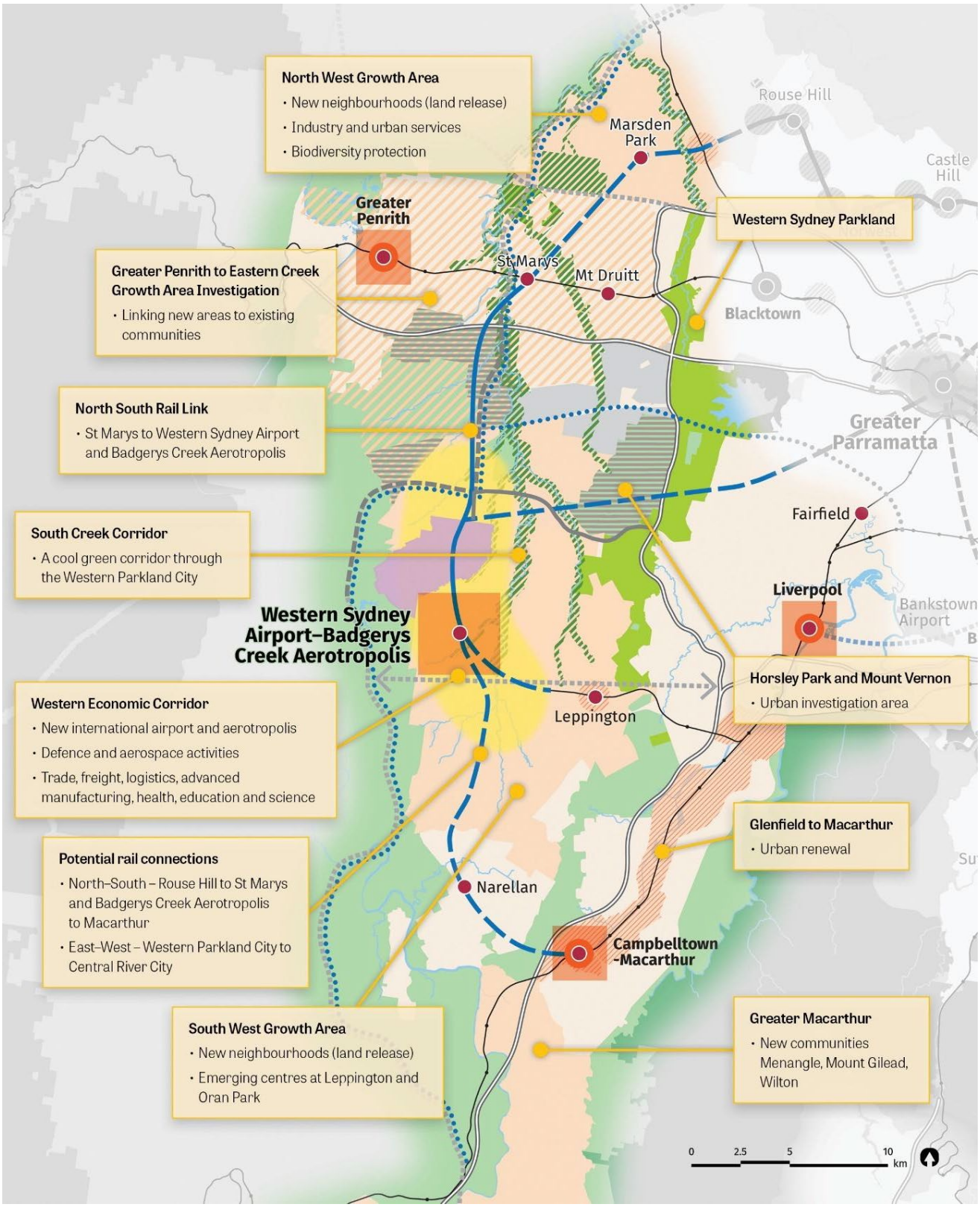
The Greater Sydney Commission has established a clear, overarching vision for Sydney as *a metropolis of three cities.* Historically, the emphasis of jobs, amenity, growth and infrastructure has been on 2 of the 3 cities – the Eastern Harbour City focused on the Sydney CBD and Central River City focused on Parramatta.

WSI is the catalyst for much of Western Sydney's future urbanisation, including the new airport as well as the Sydney Metro – Western Sydney Airport Line, road infrastructure, housing, parkland and technology, science and creative industries. The Aerotropolis will be the focus of the Western Parkland City, connecting to Greater Parramatta and the Harbour CBD to realise the vision for Greater Sydney as a metropolis of three cities (NSW GSC 2018a).

The Western Parkland City (refer to Figure 4.1) will be established on the strength of the WSI and the Aerotropolis. It will be a polycentric city capitalising on the established centres of Liverpool, Greater Penrith and Campbelltown.

4.2.2 Western City District Plan, 2018

The Western City District Plan (NSW GSC, 2018b) delivers on the Region Plan by including planning priorities to manage rural areas (W17) and to protect and enhance scenic and cultural landscapes (W16). It reflects the strategies from the Region Plan to limit urban development to outside the Metropolitan Rural Area (MRA) and to promote place-based planning to maintain or enhance the values of the MRA. Maintaining and enhancing the distinctive character of each rural village is also a high priority in the District Plan.



Source: NSW GSC, 2018a

Figure 4.1 Western Parkland City vision

4.2.3 State Environmental Planning Policy (Precincts – Western Parkland City) 2021

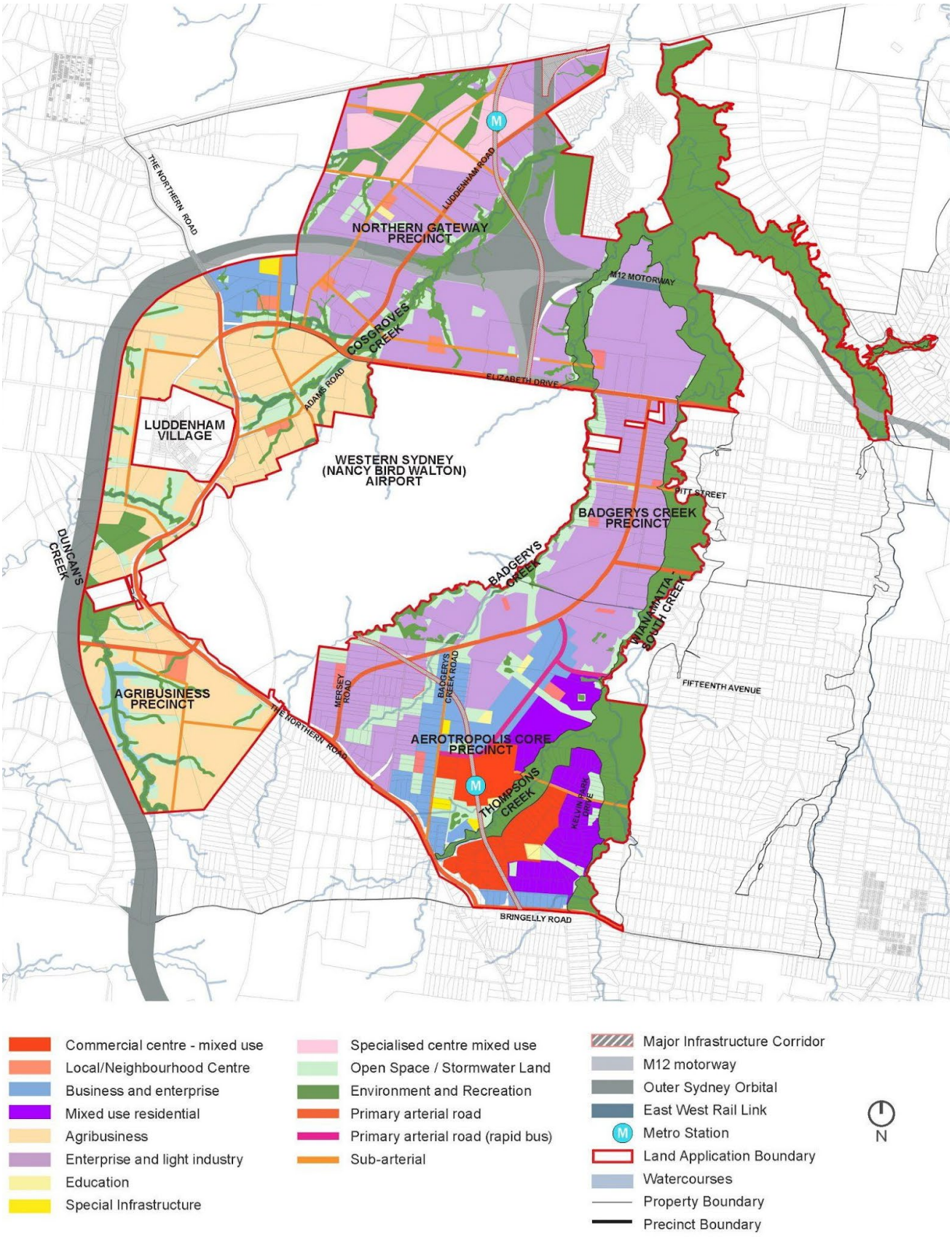
This State Environmental Planning Policy (SEPP) has replaced the *State Environmental Planning Policy (Western Sydney Aerotropolis)*. Chapter 4 of this SEPP relates to the *Western Sydney Aerotropolis* and aims to promote sustainable, orderly and transformational development in the Western Sydney Aerotropolis, providing development objectives and controls for the land use zones within each of the Aerotropolis precincts.

Maintaining the 'rural landscape character' of the Agribusiness Zone is listed as an objective (Chapter 4, Land Use Table, Agribusiness Zone). Clause 4.26 also aims to conserve the 'settings and views' of heritage items.

4.2.4 Western Sydney Aerotropolis Planning Framework

The Western Sydney Aerotropolis (The Aerotropolis, NSW DPE, 2022a-b) is a 11,200-hectare area surrounding WSI, located within the Western Parkland City. The Aerotropolis will become a hub of industry and innovation, attracting local and global companies drawn to the Western Parkland City and the airport that serves it. Western Sydney Aerotropolis is made up of several precincts (refer to Figure 4.2), including:

- The Aerotropolis Core Precinct:
  - Contains the City Centre (Bradfield, refer to Figure 4.3) for the Aerotropolis, forming a complementary centre to the metropolitan cluster of centres of Western Sydney including Penrith, Liverpool and Campbelltown. This precinct will include a Metro Station, to be surrounded by a dense, mixed use centre with areas of public realm. Building heights of up to 70 metres in this precinct.
- Northern Gateway Precinct:
  - Located immediately north of the major entry to WSI, this precinct will develop as a support precinct for WSI, with jobs in warehousing and distribution, and manufacturing, as well as an open space network, providing a range of environmental and recreation functions. Building heights of up to 45 metres in this precinct.
- Badgerys Creek Precinct:
  - The Badgerys Creek precinct is employment focused, intended to complement the role of the business park within WSI as well as the Northern Gateway employment functions. Flanked by Badgerys Creek and the Wianamatta-South Creek, these major green corridors will provide amenity for future workers. Building heights of up to 24 metres in this precinct.
- Wianamatta-South Creek Precinct:
  - This precinct will accommodate a range of environmental and recreation functions, including water flows associated with the creek environment, ecology and biodiversity functions, walking paths and separate bike routes, as well as contained areas for active recreation. Building heights of up to 24 metres in this precinct.
- Agribusiness Precinct:
  - Drawing upon the agricultural and horticultural history of the area, this precinct will support the production and value-adding of sustainable, high quality fresh produce and pre-prepared consumer foods. Building heights of up to 24 metres in this precinct.
- Luddenham Village Precinct:
  - Luddenham Village sits high on a ridgeline, at the core of the Agribusiness Precinct, set to become a tourist and cultural hub for the Aerotropolis, whilst servicing employees within the Agribusiness Precinct. The interim strategy (NSW DPE, 2022c) aims to respect and enhance the village character by keeping the building heights similar to the existing scale, incentivising uses which could assist to conserve the cottages and heritage buildings and protecting the views over the countryside.



Source: Western Sydney Aerotropolis Precinct Plan, NSW DPE, 2022b, Figure 3, page 20

Figure 4.2 Land use and structure plan for Western Sydney Aerotropolis

Source: Western Parkland City Authority, 2022

Figure 4.3 Bradfield City Centre, artists impression

The future planning framework for The Aerotropolis will be considered in this assessment, including the future intended character and potential locations for views, in the visual impact assessment, as informed by the following documents:

- Western Sydney Aerotropolis Precinct Plan 2022 (NSW DPE, 2022b)
- Western Sydney Aerotropolis Development Control Plan (DCP)
- The Luddenham Village Interim Strategy (NSW DPE, 2022c).

4.3 Local planning framework

The landscape and visual study area for the project includes, but is not limited to, localities within the following Local Government Areas (LGAs):

- City of Penrith
- City of Liverpool
- City of Blue Mountains.

Details of relevant planning documents are described below where a specific reference to landscape character or visual amenity has been made.

4.3.1 Penrith Local Strategic Planning Statement

Rural areas in the Penrith LGA are under pressure for growth and land use change, associated with projects such as WSI, the Aerotropolis and Sydney Metro.

Planning Priority 17 of the Penrith Local Strategic Planning Statement (LSPS) (Penrith City Council, 2020) aims to define and protect values and opportunities within the metropolitan rural area, which includes agricultural lands, native vegetation and biodiversity corridors, and scenic and cultural landscapes.

The Structure Plan identifies scenic landscape features to be considered for protection such as rural areas to the west of WSI (particularly the Mulgoa Valley and Wallacia Significant Rural Landscape) and South Creek.

Protection of rural land in the LGA is further prioritised in Priority 3 of the *Draft Rural Lands Strategy* (Penrith City Council, 2022) aims to preserve open space, natural beauty and cultural connections, stating:

> *'This priority is about preserving the scenic and cultural landscapes, rural views and vistas and entry points to our rural lands. While these things can sometimes be difficult to articulate, the scenic value of our rural lands is what many in the community most value.'*

In addition, clause 7.5 of the *Penrith Local Environmental Plan 2010* (Penrith City Council, 2010, s.7.5) requires development on land with 'scenic and landscape values' to minimise its visual impact from major roads and other public places.

4.3.2 Penrith Local Environmental Plan 2010

This LEP aims to… *"protect and enhance the environmental values and heritage of Penrith"* including places of *"aesthetic, architectural, natural, cultural, visual"* significance (cl.1.2(2)(f)).

Protection of scenic character and landscape values

The objective of Clause 7.5 Protection of scenic character and landscape values are:

(a) to identify and protect areas that have particular scenic value either from major roads, identified heritage items or other public places,

(b) to ensure development in these areas is located and designed to minimise its visual impact.

Areas that contain scenic character and landscape values including the Nepean River and South Creek valleys, the Mulgoa Valley and rural areas of Orchard Hills beside the M4 Motorway. Development on land to which this clause applies must … "*minimise the visual impact of the development from major roads and other public places*" (cl.7.5(3)).

These scenic character and landscape values have been considered in the landscape character and visual assessment where relevant.

4.3.3 Penrith Scenic & Cultural Landscapes Study

The purpose of this document (Penrith City Council, 2019) is to identify, protect and manage Penrith's scenic and cultural landscapes. Eight broad landscape character units (LCUs) have been identified, based on characteristics such as landform, land use and vegetation cover, which have broadly informed the location of landscape character zones identified in Section 7.1. Strategy 1 aims to conserve, maintain and improve landscape characteristics within these units.

Strategy 2 aims to protect important vistas and view corridors across the Penrith LGA, through the control of land use and development within associated view corridors. Important regional views include westerly views of the Blue Mountains and to the Nepean River.

Strategy 3 aims to protect and manage priority landscapes. These include 2 landscapes of regional or higher level scenic and cultural significance, which are the Mulgoa Valley (including Mulgoa and Wallacia) and Nepean River Corridor. Large tracts of vegetation and major creeklines have also been identified as having scenic and cultural values.

Strategy 3 aims to protect and manage 5 highly visually sensitive landscapes within the Penrith LGA. These include the views from the M4 Motorway southward across Orchard Hills, views across the northern fringe of Emu Plains, views from the Nepean River crossing toward Penrith, Regentville and Jamisontown, the urban fringe land south of Glenmore Park, and part of the Mulgoa Valley near the intersection of The Northern Road and Park Road.

These scenic character and landscape values have been considered in the landscape character and visual assessment where relevant.

4.3.4 Penrith Rural Lands Strategy

The Rural Lands Strategy (RLS) (Penrith City Council, 2022) aims to protect and enhance Penrith's rural lands by securing a Metropolitan Rural Area, a Rural edge and Protected Natural Area. Penrith's existing rural lands are split into 2 main areas, the northern rural lands to the north of the city, and the southern rural lands to the south of the city. The southern rural lands include 2 precincts, including the rural south west precinct and south-east transition precinct, which have broadly informed the location of the landscape character zones identified in Section 7.1.

4.3.5 Liverpool Local Strategic Planning Statement

The Liverpool LGA is experiencing substantial growth due to increased development, partly due to its proximity to WSI and associated Aerotropolis. Liverpool's growth places pressure on its environment and local character. The Liverpool Local Strategic Planning Statement 'Connected Liverpool 2040' seeks to manage the pressures growth is placing on the local area.

Planning Priority 16 of the Liverpool LSPS (Liverpool City Council, 2020) aims to ensure rural lands are protected and enhanced, stating that:

> *'Significant amounts of Liverpool's rural lands are earmarked for urban development, making it important that we protect remaining rural and scenic lands from urban development into the future, and that there are clear boundaries between urban, non urban and scenic lands.'*

The LSPS makes reference to protecting views or visual amenity within the LGA whilst acknowledging the pressures of development. Planning priority 8, aims to preserve the local character and heritage of existing suburbs stating that:

> *'Council is working hard to accommodate this significant growth and the opportunities it brings while ensuring that local character and heritage are preserved'.*

While scenic areas are not identified specifically in this study, and the future character is undefined, these factors have been considered in the landscape character and visual assessment generally.

4.3.6 Liverpool Local Environmental Plan 2008

This LEP aims to… *"promote a high standard of urban design that responds appropriately to the desired future character of areas"* and *"enhance the amenity and positive characteristics of established residential areas"* (cl.1.2(2)(j and m)).

There are no clauses in this LEP specifically relating to landscape character and visual amenity.

4.3.7 Blue Mountains Local Strategic Planning Statement

Planning Priority 1 of the Blue Mountains LSPS (Blue Mountains City Council, 2020) aims to maintain the World Heritage listing of the Blue Mountains. Council had a resolved position opposing the Western Sydney Airport on the basis of the potential environmental impacts on the universal values of the GBMA, stating:

> *'Ongoing environmental concerns related to airspace, flight path design, airspace management, noise and amenity are key issues for the Blue Mountains.'*

Planning Priority 5 aims to conserve and enhance the heritage, character and liveability of the Blue Mountains. It recognises the '*high amenity and landscape value'* of the Blue Mountains, stating:

> *'Many residents decide to stay or move to the Blue Mountains because of its character – the natural bushland, village lifestyle, historic charm, and small-town character. The heritage, character and liveability of our villages are a source of local pride and identity.'*

4.3.8 Blue Mountains Local Environmental Plan 2015

This LEP aims to… *"maintain the unique identity and values of the "City within a World Heritage National Park'"* and *"identify and retain the diverse built and landscape elements that contribute to the character and image of the Blue Mountains"* (cl.1.2(2)(a and j)).

The LEP identifies several areas in the Scenic and Landscape Values Map including escarpments and land between towns. The relevant values are summarised in the following paragraphs.

Protected area — escarpment

Relevant objectives of this clause (cl.6.12) are:

(a) to preserve and enhance the visual, cultural and ecological values of the escarpment systems in the Blue Mountains,

(b) to restrict development, including buildings, alterations and vegetation clearing, so as to minimise any adverse impact on the perception of escarpments as significant natural features. (cl.6.12(1)(a and b)).

Although this clause requires development to…. "*not visually disrupt the skyline by protruding above the ridgeline within or behind the site*", it does not specifically refer to the influence of flight paths on landscape character or visual amenity.

Protected area — land between towns

Relevant objectives this clause (cl.6.13) are:

(a) to identify and maintain land between towns with particular scenic value viewed from the Great Western Highway or other public places,

(b) to conserve the natural bushland character of land that separates the villages of the Blue Mountains,

(c) to ensure that development is sited and designed to minimise any adverse visual impact.

Although this clause requires development to incorporate…. "*appropriate measures to minimise any adverse visual impact on the landscape*", it does not specifically refer to the influence of flight paths on landscape character or visual amenity.

The scenic character and landscape values identified in tis LEP have informed the identification of landscape character zone types and the assessment of landscape character and visual impact where relevant.

4.3.9 Western Sydney Parklands Plan of Management 2030

Western Sydney Parklands Plan of Management (Western Sydney Parklands, 2018) provides the strategic management framework for the Parklands. The Parklands will remain mostly bushland (40%), with 30% set aside for recreation and tourism facilities and 5% designated for urban farming. The Parklands' 5,280 hectares is divided into 16 precincts within the Plan, each with specific character statements, objectives, land-use opportunities and management priorities. The character of the precincts have broadly informed the location and description of the Western Sydney Parklands landscape character zone identified in Section 7.1.

Chapter 5 Existing conditions

5.1 Landscape and visual study area

The study area for this technical paper comprises 2 geographic areas. An area of about 15 km from WSI, covering the areas of western Sydney where the preliminary flight paths are at lower altitudes and at higher frequencies. In this area plane movements are likely to be more visually prominent and more likely to affect landscape character and visual amenity. Beyond this, the study area expands to about 50 km northwest, west and southwest to consider the potential landscape character and visual impacts on the Blue Mountains. In this area, the landform rises and the landscape character and visual amenity values are more sensitive to change caused by development.

The following is a general discussion of the topography, built form and land use of the study area. The landscape and visual study area encompasses a diverse landscape, containing highly varied topography and character, both natural and urban (existing and future). Much of the study area in located on the Cumberland Plain, comprising an undulating landform with a network of river valleys and creeks such as the Nepean River valley to the west and the Eastern and Ropes Creek valleys to the east of WSI, which form part of the Western Sydney Parklands.

The landscape to the north-west of WSI includes the Mulgoa Valley and Wallacia Significant Rural Landscape (Penrith City Council, 2020), characterised by its predominantly rural landscape comprising creek flats, undulating agricultural land, wooded hills and escarpment, and large estate gardens. This area through the Western Sydney Parkland, to the north-west and north-east of WSI including the Mulgoa Valley Precinct and the Kemps and Badgerys creek valleys is identified as having '*scenic character and landscape values'* in the *Penrith Local Environmental Plan 2010*. Views to the escarpment of the Blue Mountains to the west and to the ridgelines of the Western Sydney Parklands to the east are also identified as having scenic value in the *Metropolis of Three Cities* (NSW DPE, 2022).

Further to the west, the landscape dramatically rises, defined by the Blue Mountains plateau, which stretch between the coastal lowlands of the Cumberland Plain and the Great Dividing Range. This landscape contains rugged sandstone terrain and a diversity of vegetation communities, particularly the eucalyptus dry forests and woodlands, which together form a scenic backdrop of many views from the study area. The 'outstanding landforms and scenery of the park are a major drawcard for international and domestic tourists and provide the focus for a broad range of recreation activities' (NPWS, 2001). Views from the Blue Mountains are also important, including several lookouts, which are further identified and discussed in the visual assessment (refer to Chapter 8: Visual impact assessment). Refer to Figure 5.2 and Figure 5.3 Location plan and Figure 5.4 and Figure 5.5 Topography.

Further to the north and north-east, the landscape includes undulating rural and urban areas of Penrith local government area (LGA), stretching between Penrith and St Marys, and south towards WSI. Penrith is undergoing significant transformation that is being driven by major infrastructure and land use initiatives associated with WSI and Aerotropolis. The majority of rural lands in the south eastern areas of the Penrith LGA will transition towards urban (residential and employment) and existing urban hubs will increase in density to house a growing population. Sydney Metro will be a major infrastructure project in this area, linking St Marys with WSI (tunnel to Orchard Hills) and the Aerotropolis. Western Sydney Parklands is located to the north east and east of WSI, stretching for 27 km over 3 local government areas (Blacktown, Liverpool and Fairfield), creating a large area of open space for western Sydney. Under the *Plan of Management 2030* (Western Sydney Parklands, 2018), the Parklands will remain mostly bushland (40%), with 30% set aside for recreation and tourism facilities and 5% designated for urban farming.

The landscape to the east and south-east of WSI is part of the South West Growth Area (refer to Figure 5.1). This area comprises approximately 10,000 hectares adjoining the Western Sydney Aerotropolis and the Glenfield to Macarthur Urban Renewal Corridor, transitioning from a semi-rural landscape to a series of neighbourhoods support by a major centre at Leppington.

The landscape to the south of WSI includes a large part of the Aerotropolis, located in the Liverpool LGA. There is increased residential development with new release development particularly around areas including the future Aerotropolis (Liverpool City Council, 2020). To the west of WSI, rural land along the Nepean River has been identified as a 'Metropolitan Rural Area' in Liverpool City Council's LSPS (Liverpool City Council, 2020). The western part of the Aerotropolis includes a future Agribusiness Precinct, which will consist of food production areas, logistics and commercial

development. Landscaped vistas within the Agribusiness Precinct, towards the Blue Mountains and along Cosgroves Creek are identified in the *Western Sydney Aerotropolis Precinct Plan* (NSW DPE, 2022).

The Outer Sydney Orbital (M9 Motorway) is a potential long term project in the landscape and visual study area, comprising a future motorway and potential freight rail line, connecting the North West Growth Area through Penrith LGA and Western Sydney Airport to Campbelltown-Macarthur and beyond (refer to Figure 5.1).

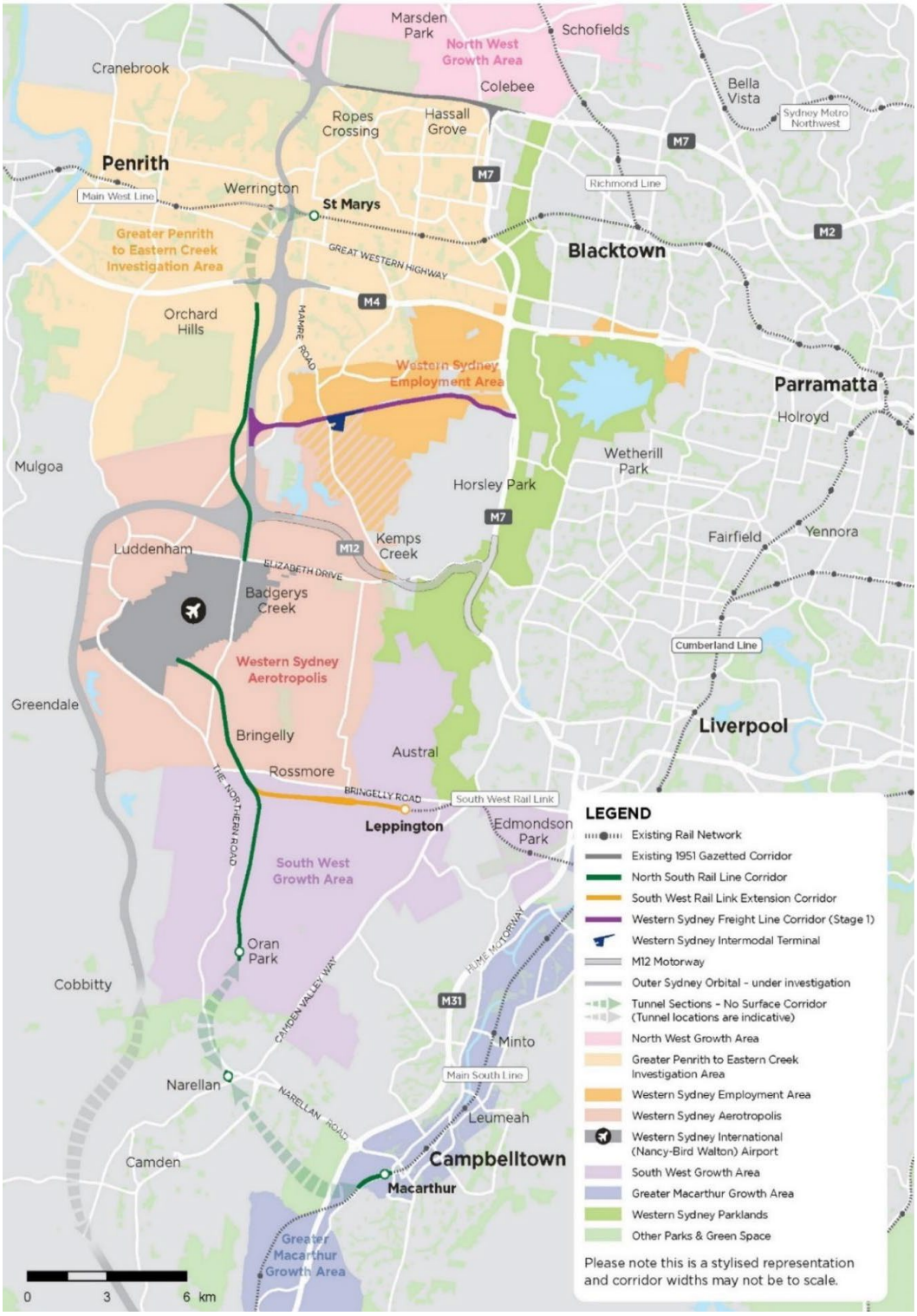


Figure 5.1 Summary of corridors and planning intentions for Western Sydney [Source: Transport for NSW, 2020a]

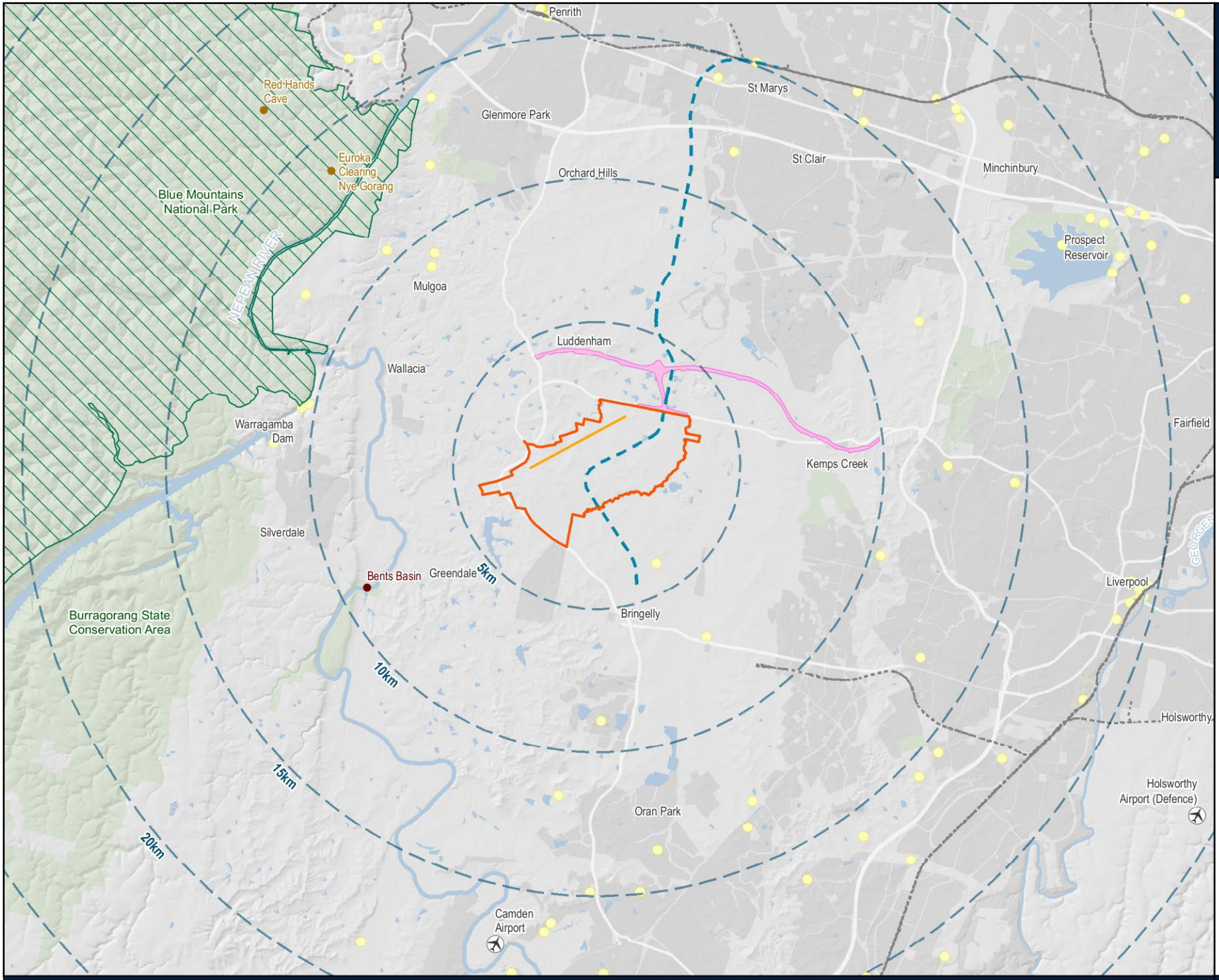


Figure 5.2

Site location plan - Western Sydney

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Railway
- Proposed Sydney Metro
- Proposed M12 Motorway
- Radial distances
- Greater Blue Mountains World Heritage Area
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

0 2 4 km

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:175,000 Date: 19/05/2023

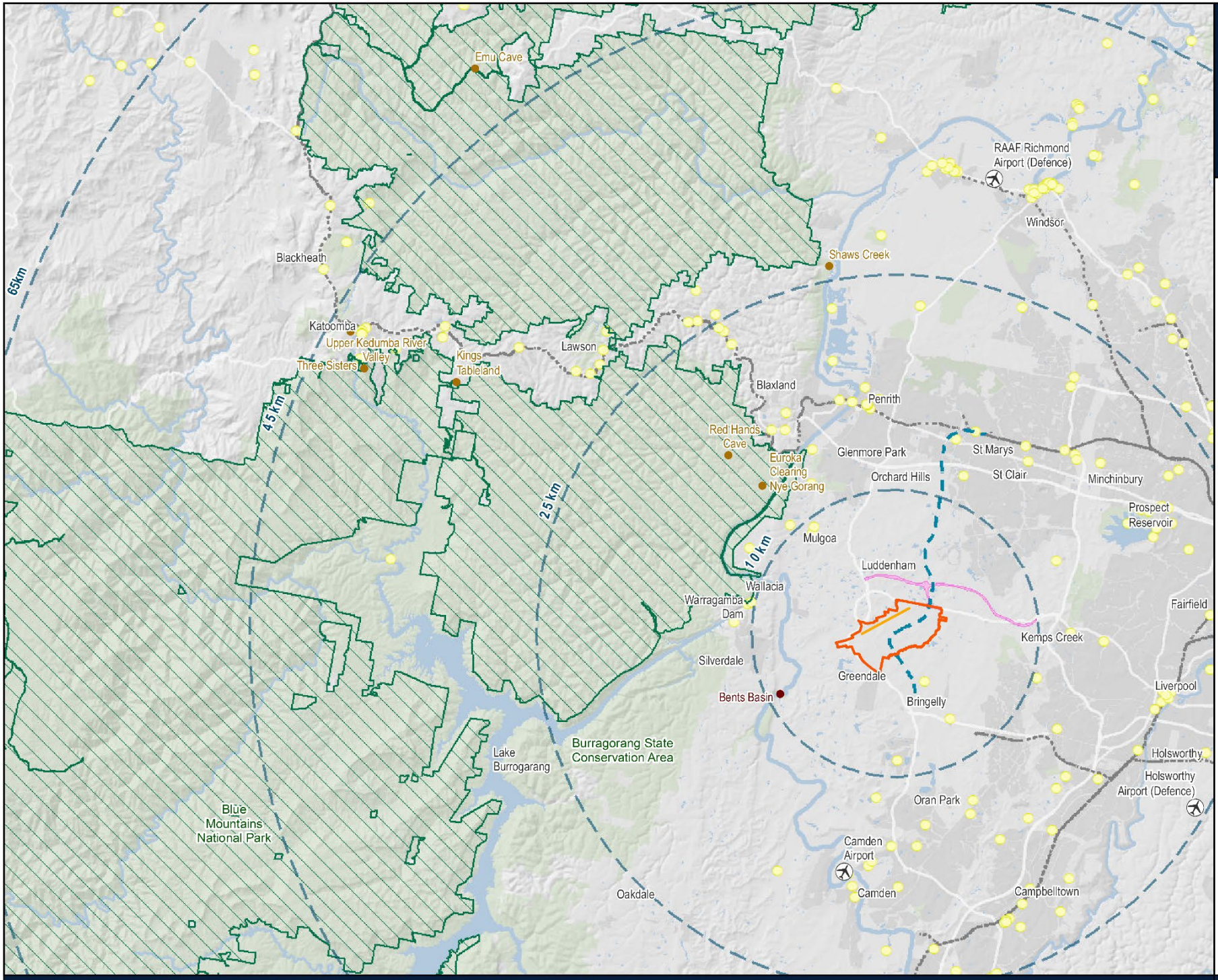


Figure 5.3

Site location plan - Blue Mountains

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Railway
- Proposed Sydney Metro
- Proposed M12 Motorway
- Radial distances
- Greater Blue Mountains World Heritage Area
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 19/05/2023

Data sources - DITRDC, DCS, Geoscience Australia
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Airbus/UCS/NGA/NASA/CGIAR/NCOS/INLOS/WIA/Geoscience Australia/GSA/GSI and the GIS User Community

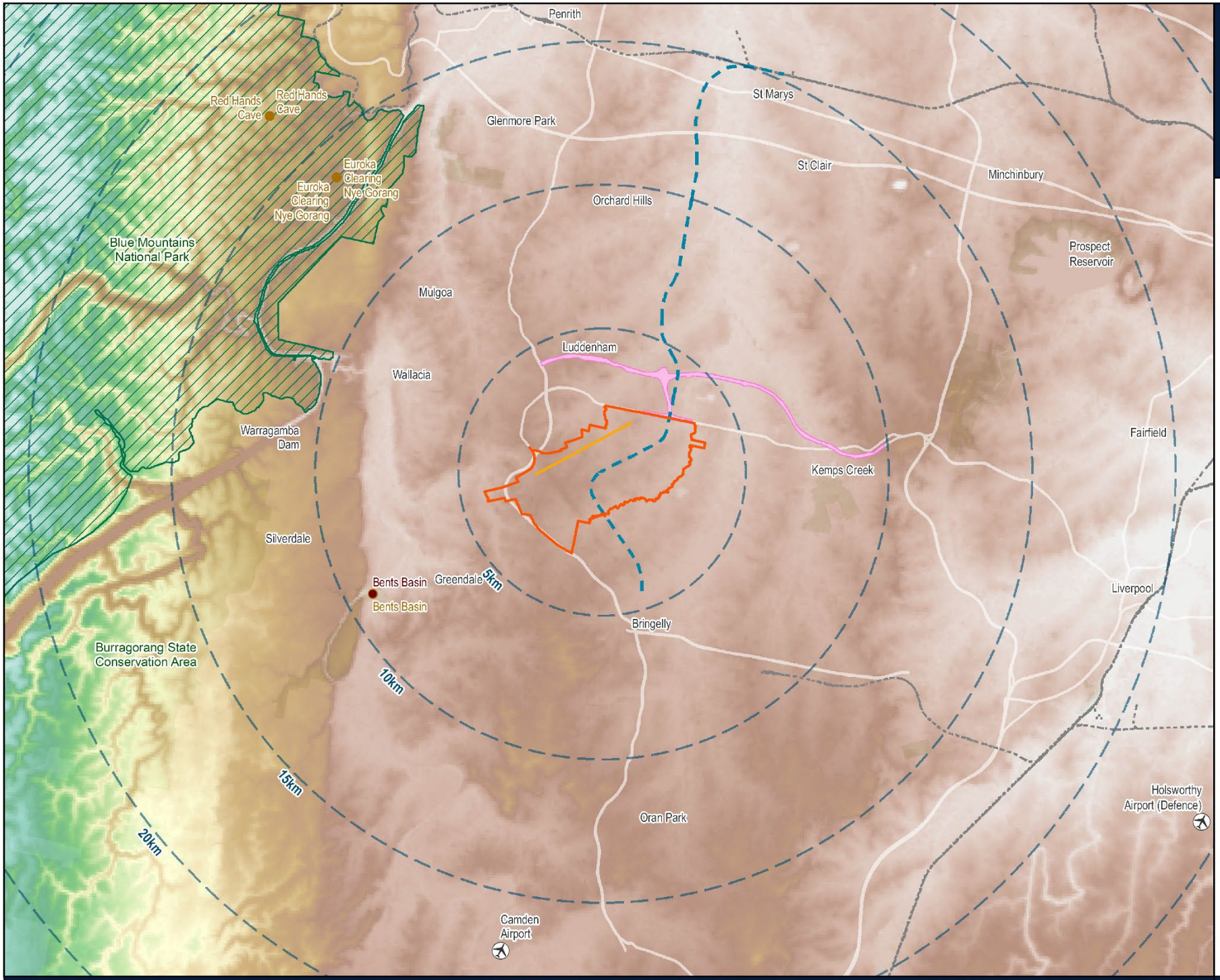


Figure 5.4

Topography plan - Western Sydney

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Elevation

High : 574

Low : -32

0 2 4 km

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:175,000 Date: 2/08/2023

Data sources: - DITRDC, DCS, Geoscience Australia
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

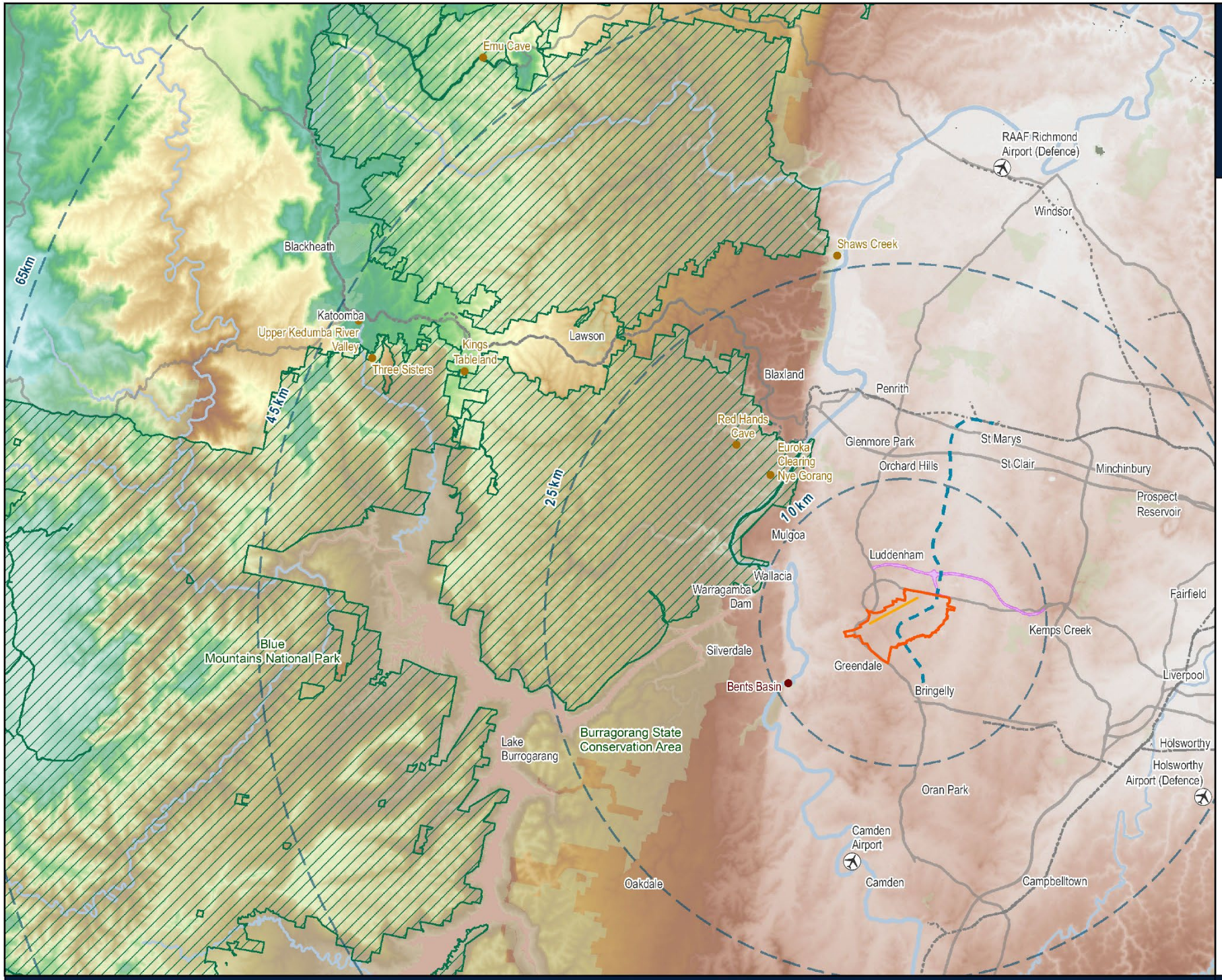


Figure 5.5

Topography plan - Blue Mountains

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Elevation

High : 1370

Low : -32

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 2/08/2023

Data sources: DITRDC, DCS, Geoscience Australia

5.2 The WSI site

The WSI site encompasses nearly 1,800 hectares of formerly undulating terrain. It is a landscape in transition, changing from a largely rural area to a major international airport. Construction commenced in 2018 and WSI is planned to be in operation in 2026. Early earthworks have finished and the major earthworks at WSI are near complete. Construction is in progress for the main airport terminal, as well as the airside civil and pavement works, including the runway, taxiways and roads.

5.3 Sensitive locations within the study area

The landscape and visual study area includes several important environmental, cultural and historic places and routes, which have varying levels of sensitivity. The sensitivity of a landscape character zone or view is 'its capacity to absorb change' (TfNSW 2020). The location of a view on a tourist route or within an area of wilderness or historic importance typically increases its sensitivity due to the greater number of likely viewers and the greater emphasis that travellers, tourists and recreational users have on landscape appreciation.

The following list summarises these generally. These receptors have been used to identify representative viewpoints and define the visual sensitivity of each view, and also informed the sensitivity level assigned to the landscape character zones. This approach is further explained in Chapter 6 of this technical paper.

Key receptors that have an elevated landscape character or visual sensitivity are:

- GBMA, including the many scenic lookouts such as:
  - Echo Point lookout, Katoomba (1 of the 15 of the 'best scenic lookouts' listed by Destination NSW, 2022) offering panoramic views across the GBMA including the Three Sisters, the Jamison Valley, Mount Solitary and Narrow Neck
  - Portal Lookout (also 1 of the 15 of the 'best scenic lookouts' listed by Destination NSW, 2022), offering views of the junction between Glenbrook Gorge and the Nepean River
  - Nepean Lookout, Nepean Lookout Trail
  - The Rock Lookout, Fairlight Road, Mulgoa.
- Lookouts, including those in protected areas (e.g. National Parks and State Heritage or Conservation Areas), such as:
  - Burragorang lookout, Warragamba Dam
  - George Maunder lookout, Prospect Reservoir
  - Hawkesbury Lookout.
- Campgrounds and day-use areas in the GBMA or protected areas such as:
  - Euroka Campground, Glenbrook
  - Perrys Lookdown, Blackheath
  - Dunphys Campground, Megalong Valley
  - Ingar, Wentworth Falls
  - Murphys Glen, Woodford.

- Scenic and tourist drives such as:
  - 'Warragamba Waters scenic drive' along Silverdale Road (Wollondilly Shire Council, 2022), and part of the 'Greater Blue Mountains Drive, identified by NSW NPWS
  - 'Greater Blue Mountains scenic drive', including the Great Western Highway, from Sydney along the M4 towards the Blue Mountains (Visit NSW, 2022) and also part of the 'Greater Blue Mountains Drive' identified by NSW NPWS
  - The Bells Line of Road, connecting several towns within the Blue Mountains and part of the 'Greater Blue Mountains Drive, identified by NSW NPWS.
- State Heritage Register places, including:
  - Prospect Reservoir and surrounding area
  - Linden Observatory, 91-111 Glossop Road, Linden
  - Several rural homesteads and estates such as:
    - Fairlight (377–429 Fairlight Road Mulgoa)
    - Fernhill Estate (1041–1117 Mulgoa Road, Mulgoa)
    - Glenleigh Estate (427–507 Mulgoa Road Mulgoa, also a reception centre):
    - Glenmore (754–760 Mulgoa Road Mulgoa)
    - Kelvin Park Homestead (30 The Retreat Bringelly)
    - Mamre (181–275 Mamre Road Orchard Hills)
    - Rose Cottage and slab hut (14 Tennant Road Werrington).
- Local Heritage Register places listed in LGA LEPs, including:
  - Several buildings within Luddenham village
  - Regentville (460A–626 Mulgoa Road Mulgoa), part of Mulgoa Nature Reserve.

Chapter 6 Methodology

6.1 Guidance for landscape and visual impact assessment

A range of guidance is available for the assessment of landscape and visual impact. However, specialists undertaking landscape and visual assessments typically refer to the following guidance:

- *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, Transport for NSW, 2020
- *The Guidance Note for Landscape and Visual Assessment*, Australian Institute of Landscape Architects Queensland, 2018
- *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management & Assessment.

The methodology prepared for this assessment draws upon the guidance in these documents.

These guidelines differentiate between landscape character and visual impact assessment. The Guideline for Landscape Character and Visual Impact Assessment EIA-NO4 describes the difference …'*landscape character impact assessment—the assessment of impact on the aggregate of an area's built, natural and cultural character or sense of place and visual impact assessment—the assessment of impact on views'*. (p.4 TfNSW 2020)

The impact assessment approach for each of these assessments is described in the following sections.

6.2 Impact assessment approach

6.2.1 Assessment of impact on landscape character and scenic values

Landscape is defined as … '*All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure*.' (TfNSW, 2020).

Landscape character is the … '*combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place'* (TfNSW, 2020).

The landscape assessment begins with the identification of landscape character zones (refer to Chapter 7). An assessment of landscape impact was then carried out by identifying the sensitivity of each zone, describing the magnitude of change expected as a result of the project, and combining these factors to make an overall assessment of landscape impact. The landscape assessment has been undertaken based on daylight operations.

6.2.1.1 Identification of landscape character zones

The landscape assessment begins with the identification of landscape character zones. A landscape character zone is … *'An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby'* (TfNSW 2020).

Due to the scale of project, there have been 2 approaches to the identification of landscape character zones.

In Western Sydney, the landscape and visual study area has been divided into landscape character zones spatially. These character zones are based on the landscape character zones that were identified in the 2016 EIS and refined to reflect changes to the landscape and planning intentions. These landscape character zones are defined primarily by geology, topography, vegetation, waterways, built form patterns and land use (both existing and future). These zones consider the features of the particular locality and local landscape features.

Within the Blue Mountains, the landscape character zones have been described and not spatially defined. These zones reflect landscape types which are characterised by particular geology, topography, vegetation, waterways, built form patterns and land use types. The broad landscape character zones (or types) for the Blue Mountains have been illustrated with reference photographs.

6.2.1.2 Landscape sensitivity

Landscape sensitivity refers to the value placed on a landscape and its susceptibility to change. The sensitivity of a landscape may reflect the frequency and volume of users, as well as valued characteristics such as scenic amenity, its contribution to sense of place, and rarity. The value of landscapes can be described in Federal, State and local government masterplans and planning documents and protected by legislation. These values reflect the importance of a landscape to the local, regional and wider community.

The scenic quality of the landscape is also considered, with areas with more distinctive terrain, greater vegetation cover, natural waterbodies, heritage or cultural landscape and built form features, for example would have a higher landscape sensitivity and greater susceptibility to change, whereas landscapes with less terrain, fewer trees, human created farmland and areas with a more dominating presence of development, would have a lower landscape sensitivity and a greater capacity to accommodate change.

Landscape sensitivity in this assessment has been considered in the broadest possible context, from those landscapes of national importance through to those considered to be landscapes of importance locally. Table 6.1 lists the landscape sensitivity levels that apply to this assessment.

Table 6.1 Landscape character sensitivity levels

Landscape sensitivity	Description
Very high	• Landscape feature or place protected under national legislation or international policy e.g. World Heritage Areas and National Parks. • Typically includes distinctive, unique and landscape features which are uncommon across the nation and internationally. This may include dramatic landform (isolated peaks, steep rocky ridges, cones, escarpments), distinctive natural water bodies (prominent lakes, reservoirs, rivers, streams, wetlands and swamps, harbour, inlet, bay or open ocean) and vegetation, iconic heritage places. • Comprises a high sense of tranquillity and wilderness with minimal evidence of human presence.
High	• Landscape feature or place that is iconic to the State. • Typically includes some unique and landscape features which are uncommon within the state such as dramatic landform, iconic heritage places, attractive natural water bodies and vegetation. • Comprises a sense of tranquillity and wilderness. • May include some presence of human presence e.g. small scale built development.
Moderate	• Landscape or place that is heavily used and/or valued by residents of a major portion of a city or a non-metropolitan region and/or places with regionally important scenic value or landscape features. • May include urban areas with a greater density of urban development where character and amenity is important. • May include landscape features that are uncommon within the region, such as: – locally distinctive landform features (hilly and undulating ranges, broad shallow valleys, moderately deep gorges or moderately steep valley walls, and rocky outcrops) – attractive natural waterbodies (streams, lakes, rivers, swamps) – natural and planted vegetation (native forests, streamside vegetation, human influenced vegetation such as vineyards and orchards) – state and local heritage places which contribute to character e.g. Prospect reservoir.

Landscape sensitivity	Description
Low	• Landscape valued and experienced by concentrations of residents and/or local recreational users and/or places of local scenic value or local landscape features. • May include regionally common landscapes and features, such as: – gentle landforms (hilly and undulating ranges, broad shallow valleys, open plains) – modified natural and human made waterways (dams and reservoirs), scattered or sparsely vegetated (scattered trees in fields with limited variation) – local heritage places and/or a dispersed presence of human settlement (such as villages, small towns, isolated pockets of production and industry, lower scale and trafficked transport infrastructure). • May be a landscape transitioning to urban development.
Very low	• Places without any particular scenic value or local landscape features, or which are common across the region and beyond. • May include: – indistinct landform features (large expanses of flat or gently undulating landform) – limited tree cover such as extensively cleared rural areas and indistinctive stands of exotic trees – pastoral and arable areas including crops and grazing lands – human created waterbodies (farm dams, irrigation canals or stormwater infrastructure), and/or – dominating presence of human settlement (e.g. dominating presence of infrastructure, industrial areas highly modified landscapes such as mines).

6.2.1.3 Magnitude of change levels

The magnitude of change refers to the changes to the landscape character that would occur as a result of the project. The magnitude of change will consider both direct and indirect changes. The magnitude of change is assigned a level based on the categories described in Table 6.2.

While the project would not result in direct changes to the landscape such as the removal of trees and tree canopy, open space and public realm areas, the project may result in indirect impacts, such as changes to the characteristics of the landscape that form its sense of place and unique identity, for example, due to the introduction of aeroplanes, and in some cases contrails, in the sky which may contrast with the existing character. The magnitude of change relates to the entire landscape character zone or area, not just changes to a small area or localised changes. Visibility is a part of landscape character and areas which are more widely seen would have a greater influence on landscape character.

Table 6.2 Landscape magnitude of change levels

Magnitude of change	Description
Very High	• The landscape is altered such that the project dominates and/or transforms its character. • This would result in an extensive and/or severe change in landscape character, such as the introduction of elements that are widely visible and contrast substantially with the characteristics of the existing landscape character.
High	• The project substantially changes and/or is not compatible with the character of the landscape. • This may include result in a considerable change in landscape character, such as the introduction of elements that are widely visible and contrast with the characteristics of the existing landscape character.
Moderate	• The project noticeably changes and/or is not compatible with the character of the landscape. • This may include the introduction of elements that are visible from some areas and/or contrasts somewhat with the characteristics of the existing landscape character.
Low	• The project slightly changes and/or is compatible with the landscape character. • This may include the introduction of elements that have minimal visibility, influence a small extent of the landscape character zone, and/or contrasts noticeably with the characteristics of the existing landscape character.
Negligible	• The project would not change the existing landscape character.

6.2.1.4 Assigning landscape character impact levels

An assessment of landscape impact has been made by combining the landscape sensitivity and magnitude of change levels for each landscape character zone and assigning an impact level (refer to Table 6.3).

Table 6.3 Landscape impact levels

		Sensitivity				
		Very high	**High**	**Moderate**	**Low**	**Very low**
Magnitude	**Very high**	Very high	Very high	High	High-Moderate	Moderate
	High	Very high	High	High-Moderate	Moderate	Moderate-Low
	Moderate	High	High-Moderate	Moderate	Moderate-Low	Low
	Low	High-Moderate	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

6.2.2 Assessment of visual impact

The assessment of visual impact uses a representative viewpoint assessment approach. Representative viewpoints have been selected from the landscape and visual study area of the project. Each view has then been assessed by identifying the magnitude of change created by the project, and the sensitivity of the expected viewer. Combined, these characteristics of the view are then used to assign a level of potential visual impact. This methodology is explained more fully in the following paragraphs.

6.2.2.1 Representative viewpoints

Site inspections were carried out during October 2022 and February 2023. These inspections verified the results of a preliminary viewshed analysis.

Representative views to the project were selected, including views from areas where the greatest number of viewers are likely to congregate, such as lookouts, road corridors and scenic routes, as well as locations in sensitive recreational and natural areas, such as campgrounds or activities in the GBMA.

Photomontages have been prepared for representative viewpoints to support the assessment of impact. These views illustrate locations where the project would be seen from locations of higher sensitivity and also to show a typical view within some of the landscape character zones.

6.2.2.2 Visual sensitivity

Visual sensitivity refers to the nature and duration of views. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity.

To ensure the impacts are attributed fairly, the sensitivity of each viewpoint is considered in the broadest context of possible views, including those of national importance through to those considered to have a neighbourhood importance. Table 6.4 lists the terminology used to describe the level of visual sensitivity in this technical paper.

Table 6.4 Visual sensitivity table

Visual sensitivity	Description
Very high	• Heavily experienced view to a national icon, e.g. view from lookouts within the GBMA, and/or • Views to areas with a scenic value of national importance or to landscape features of the state, and/or • These views are generally unique and uncommon nationally.
High	• Heavily experienced view to a feature or landscape that is iconic to the state, and/or • Views to areas with a scenic value recognised by the state. • These views are generally unique or uncommon within the state.
Moderate	• Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space, and/or • Views to areas of regionally important scenic value or to landscape features of the region. • These views are generally unique or uncommon within the region.
Low	• High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users, and/or • Views to areas of local scenic value or to local landscape features. • These views are somewhat common within the landscape.
Very low	• Views where visual amenity is not as important to the wider community, such as lower quality views briefly glimpsed from roads. • These views are likely to be common within the landscape.

6.2.2.3 Magnitude of change

For the assessment of visual impacts, magnitude of change refers to the change that would be seen as a result of the project from a given viewpoint. This includes what has changed, and how it has changed. Magnitude of change describes the extent of change and identifies elements which are removed or in this case added, changes in remoteness and tranquillity, and compatibility of new elements with the existing landscape.

A high magnitude of change would result if the project contrasts strongly with the existing landscape. Whereas a low magnitude of change occurs if there is visual compatibility or minimal visual contrast between the project and the landscape in view. In this situation the project may be noticeable but does not noticeably contrast with the existing modified and transitioning landscape surrounding WSI.

Table 6.5 lists the terminology used to describe the magnitude of change in this technical paper.

Table 6.5 Magnitude of change levels

Magnitude of change	Description
Very High	• The view is altered such that the project visually dominates and transforms the character of the view. • The project would result in a substantial change in the amenity of the view.
High	• The project is visually prominent, and/or contrasts with the character of the view. • The project would result in a considerable change in the amenity of the view.
Moderate	• The project is somewhat prominent and/or is not compatible with the character of the view. • The project would result in a noticeable change in the amenity of the view.
Low	• The project is not visually prominent and/or is visually compatible with the character of the view. • The project would result in a slight change in the amenity of the view.
Negligible	• The project is not visible, is not visually prominent in the view and/or is compatible with the character of the view. • The project would result in no perceived change in the amenity of the view.

There are some general principles regarding the relationship between the project and the landscape which determine the magnitude of change level. These principles, or assumptions, relate to how well a flight path can be absorbed into the landscape setting and what is considered to be more or less visually harmonious.

These principles have been applied generally to the viewpoint assessment, and include:

- **Vertical and horizontal distance** the greater the distance, the less prominent the planes are likely to be (refer to Figure 6.2 and Figure 6.3).
- **Area of sky occupied**, i.e. frequency of flights and number of flight paths visible (refer to Figure 6.1).
- **Visibility of the sky**, i.e. open and expansive skyline where the sky is a critical feature in views, versus an enclosed sky where buildings or vegetation screen and reduce visibility (refer to Figure 6.1).
- **Development context and character**, the presence of other existing infrastructure of a similar character (e.g. vehicular traffic and existing flight paths) can increase the compatibility of development within a view (refer to Figure 6.1).

Very high	High	Moderate	Low
Horizontal distance Planes seen less than 1 kilometre away (horizontal distance).	Planes seen at around 2 km away.	Planes seen at around 5 km away.	Planes seen at around 10 km away.
Altitude Planes seen under 1000 metres (about 1,600 - 3,200 ft)	Planes seen under around 1-2km (3,200 - 6,500ft altitude).	Planes seen at 3-5 kilometres (10,000 - 16,500ft altitude).	Planes seen at 5-10 kilometres altitude (16,600 - 32,000ft).
Frequency Continuious stream of flights throughout a given day	Numerous flights visible per day	Many flights visible per day	Several flights visible per day
Area of sky occupied by planes Numerous flight paths visible.	Several flight paths visible.	Several flight paths visible.	One flight path visible.
Visibility of the sky			
 Open and expansive skyline. Sky is a critical feature in view.	 Sky mostly open	 Sky partly enclosed by built form.	 Sky not prominent and / or enclosed by built form.

Figure 6.1 Visual magnitude principles

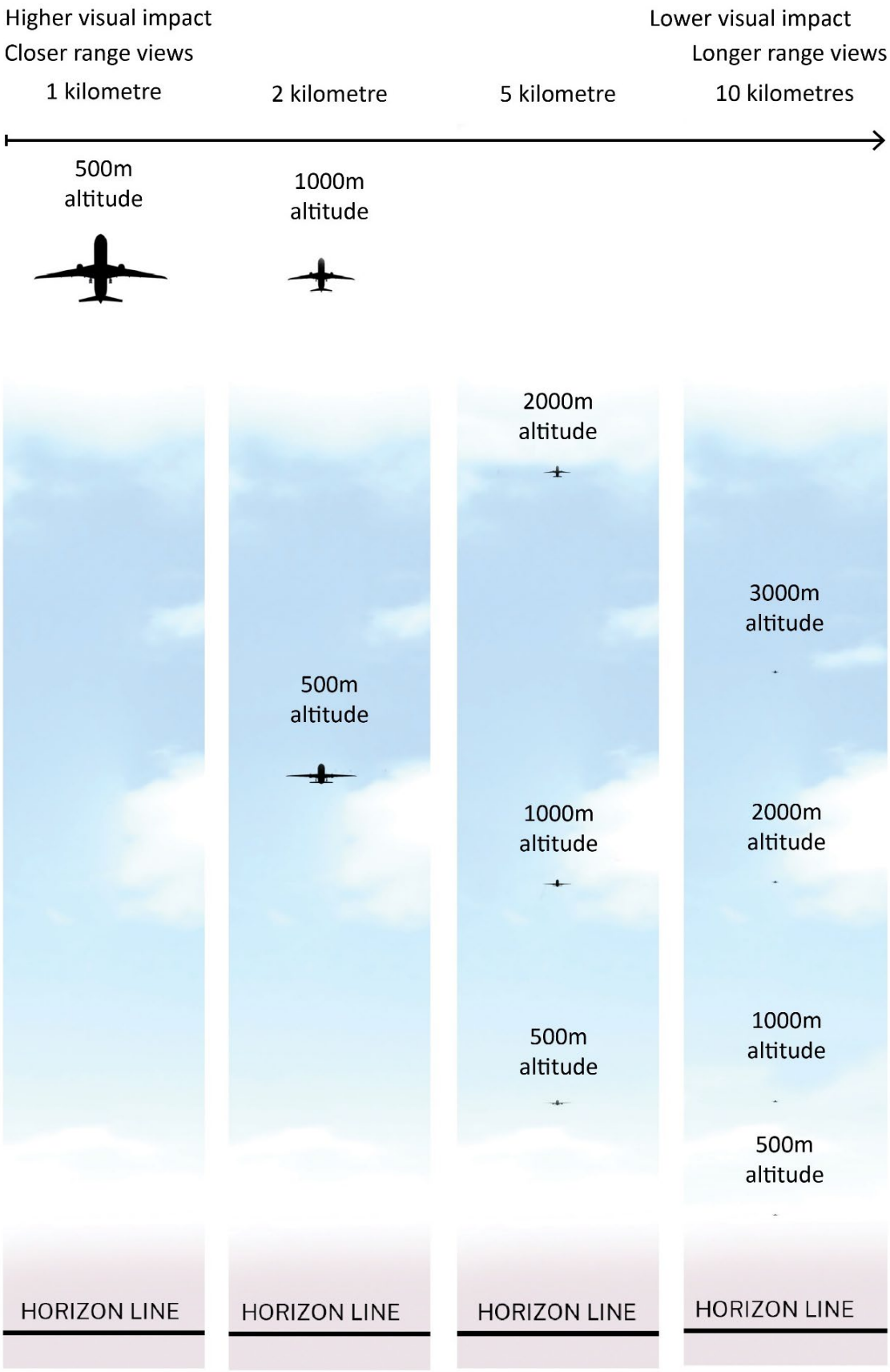


Figure 6.2 Visible scale of planes based on distance and altitude (B777 plane shown)

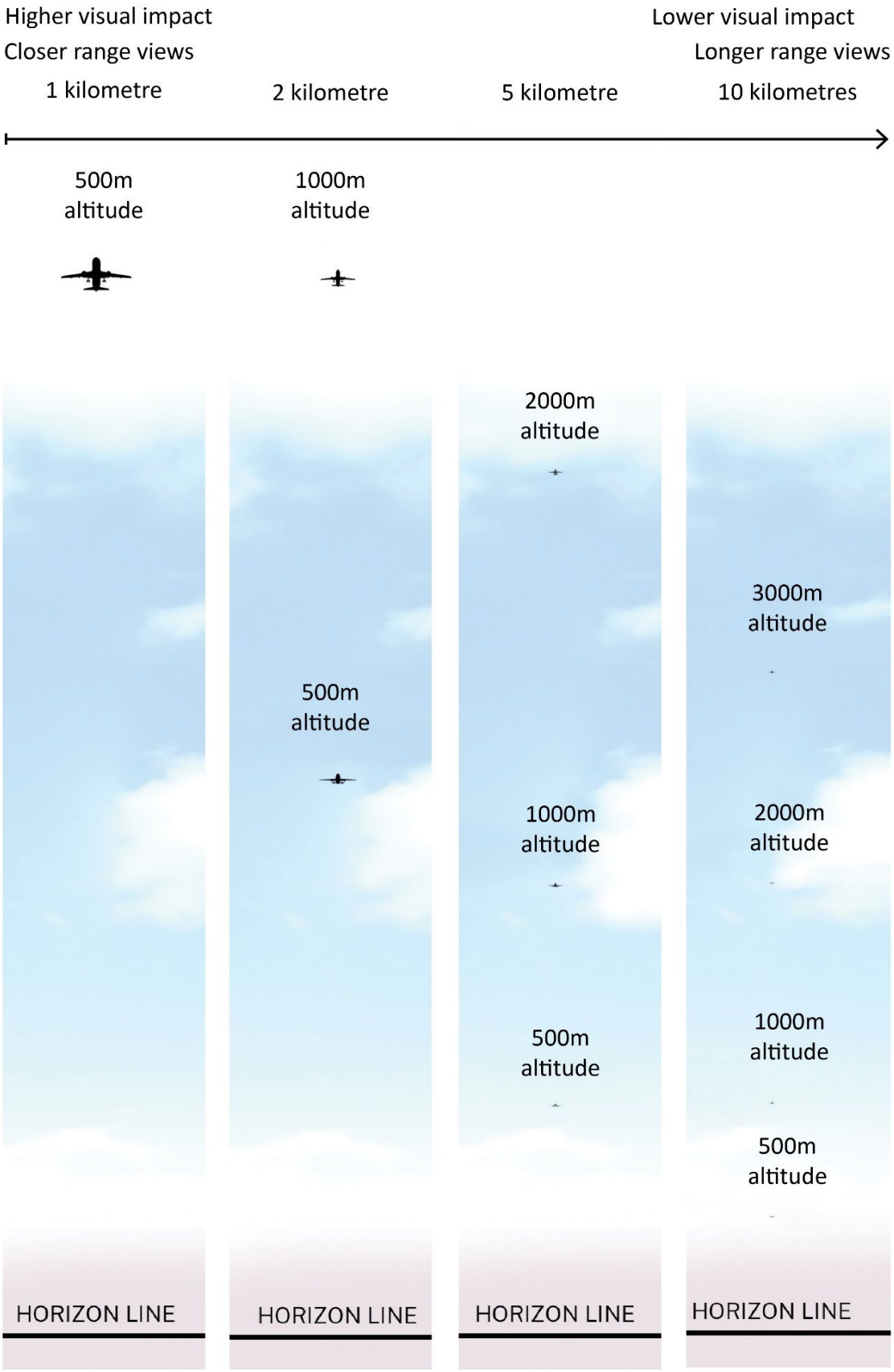


Figure 6.3 Visible scale of planes based on distance and altitude (A320 plane shown)

6.2.2.4 Assigning visual impact levels

An assessment of visual impact has been made by combining the visual sensitivity and magnitude of change levels for each representative viewpoint and assigning an impact level, as shown in Table 6.6.

Table 6.6 Visual impact levels

		Sensitivity				
		Very high	**High**	**Moderate**	**Low**	**Very low**
Magnitude	**Very high**	Very high	Very high	High	High-Moderate	Moderate
	High	Very high	High	High-Moderate	Moderate	Moderate-Low
	Moderate	High	High-Moderate	Moderate	Moderate-Low	Low
	Low	High-Moderate	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

6.2.2.5 Photomontages

Photomontages have been prepared to illustrate the expected changes to views as a result of the project at representative locations within the landscape and visual study area. Photomontages are created using a combination of 3D modelling and photo editing techniques.

The process used to prepare these images was as follows:

- GPS coordinates and details of the camera was recorded
- a terrain model was prepared using contours with 5 metre intervals (from ELVIS)
- generate the flight paths and add the 3D plane models along the flight path
- a virtual camera was positioned in the digital model using the photograph's GPS data for each image
- the virtual camera was matched using the digital surface model/terrain to align the view
- plane(s) along the preliminary flight path(s) were modelled in 3D and materials assigned to the model.

These modelled views were then edited in photo editing software to insert the model into the photograph.

For this assessment, wide body jet planes (international and domestic size) have been located along an indicative flight path. It is noted that the route of planes may be shifted slightly along the flight path during finalisation of the project design and during operation, however the assessment presents a representative illustration on of static planes on the flight paths. For each photomontage, an image has been prepared that includes a line showing the flight path, and multiple planes in silhouette located along each flight path. The spacing of these planes does not represent plane frequency, but aims to illustrate the effect of planes that may be moving across the sky.

The viewpoints used to create these photomontages were chosen to represent a range of viewing locations, from a distance and orientation where the project would be most visible. The photomontage locations were also chosen to illustrate views from areas with the greatest visual sensitivity and where the greatest number of viewers would be located.

6.2.3 Assessment of night-time visual impact

An assessment of the potential visual impacts of the project at night during construction and operation has been undertaken, using the broad environmental zones that occur within the landscape and visual study area. Night hours for this assessment are during hours of darkness, and while there is a night time flight path between 23:00 and 05:30, there will also be day time flight paths that will be used in the hours of darkness before and after this time period. The night-time visual impact assessment includes the RRO mode of operation. The RRO mode of operation can only be used between 23:00 and 05:30 when weather conditions permit and air traffic are low enough to permit safe operations.

The assessment of night-time impact has been carried out with a similar methodology to the daytime assessment. However, the assessment also draws upon the guidance contained within AS4282 Control of the obtrusive effects of outdoor lighting (2019).

AS4282 identifies 4 main potential effects of lighting, which are, the effects on residents, transport system users, transport signalling systems and astronomical observations. Of relevance to this assessment is the effects of lighting on the visual amenity of residents and transport system users and astronomical observations.

AS4282 identifies environmental zones which are useful for categorising night-time landscape settings. The following assessment has used these environmental zones to describe the existing night-time visual condition and assign a sensitivity to these settings.

6.2.3.1 Night-time visual sensitivity

The environmental zones (defined in AS4282) which best describe the existing night-time visual condition of the landscape and visual study area has been selected. These zones are typical night-time settings and reflect the predominant light level within the study area. Each environmental zone is assigned a level of sensitivity as shown in Table 6.7.

Table 6.7 Environmental zone sensitivity – night-time

Sensitivity level	Environmental Zones (AS4282:2019)	
	Description	Examples
Very high	A0: Intrinsically dark	UNESCO Starlight Reserve IDA Dark Sky Parks Major optical observatories No road lighting – unless specifically required by the road controlling authority
High	A1: Dark	Relatively uninhabited rural areas No road lighting – unless specifically required by the road controlling authority
Moderate	A2: Low district brightness	Sparsely inhabited rural and semi-rural areas
Low	A3: Medium district brightness	Suburban areas in towns and cities
Very low	A4: High district brightness	Town and city centres and other commercial areas Residential areas abutting commercial areas

6.2.3.2 Night-time magnitude of change

Following the sensitivity assessment, the magnitude of change that would be expected within each environmental zone identified within the study area at night is then identified. Table 6.8 lists the categories used to describe the magnitude of change at night.

Table 6.8 Magnitude of change levels – night-time

Magnitude of change	Description
Very high	• Substantial change to the level of skyglow, glare or light spill expected, and/or • The lighting of the project would transform the character of the surrounding setting at night, and/or • The effect of lighting would be experienced over an extensive area.
High	• Considerable change to the level of skyglow, glare or light spill and/or • The lighting of the project would noticeably contrast with the surrounding landscape at night and/or • The effect of lighting would be experienced across a large portion of the landscape.
Moderate	• Alteration to the level of skyglow, glare or light spill would be expected, and/or • The lighting of the project would contrast with the surrounding landscape at night, and/or • The effect of lighting would be experienced across a moderate portion of the landscape.
Low	• Alteration to the level of skyglow, glare or light spill would be expected, and/or • The lighting of the project would not contrast substantially with the surrounding landscape at night, and/or • The effect of lighting would be experienced across a small portion of the landscape.
Negligible	• Either the level of skyglow, glare and light spill is unchanged or • If it is altered, the change is generally unlikely to be perceived by viewers or • Compatible with the existing or intended future use of the area.

6.2.3.3 Night-time visual impact levels

An assessment of night-time visual impact has been made by combining the visual sensitivity of the environmental zone with the night-time magnitude of change for each environmental zone identified within the study area generally and assigning an impact level, as shown in Table 6.9. This technical paper has been undertaken for operational impacts.

Table 6.9 Visual impact levels – night-time

		Sensitivity (AS4282:2019 Environmental Zone)				
		Very high (A0)	**High (A1)**	**Moderate (A2)**	**Low (A3)**	**Very low (A4)**
Magnitude	**Very high**	Very high	Very high	High	High-Moderate	Moderate
	High	Very high	High	High-Moderate	Moderate	Moderate-Low
	Moderate	High	High-Moderate	Moderate	Moderate-Low	Low
	Low	High-Moderate	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

6.2.4 Assessment of cumulative impact

Cumulative impacts can indicate that the combination of effects created by multiple projects may be greater than the sum of the individual effects. Cumulative impacts between projects have been addressed based on assumptions about the likely implementation of proposed projects within surrounding areas.

A general discussion of the cumulative effects of this project together with the changing character of the landscape and as appreciated in views has been provided where relevant.

6.3 Limitations and assumptions

6.3.1 Limitations of this technical paper

This assessment has considered distances from the flight path, however, for operational and safety reasons, aircraft may operate within wider flight path corridors (refer assumptions at Section 6.3.2), that could bring aircraft closer than assumed in this assessment. This is more likely to affect views further from the Airport Site, such as across the Blue Mountains.

The scheduling and therefore frequency of flights is not yet known. This assessment considers the flight frequencies relied upon in Technical paper 1: Aircraft noise (Technical paper 1) and assumes these flights occur evenly across either day or night time operating hours. There is, however, likely to be peak hours when more flights would occur the details of which were unknown at the time of writing.

All altitudes vary by aircraft type, weight, destination, weather, individual pilot technique, air traffic control instructions and other factors. The altitudes provided in this assessment are assumed based on the mapping provided in Technical paper 1.

The night time assessment has utilised the AS4282 Control of the obtrusive effects of outdoor lighting (2019), which aims to manage lighting on the ground and does not contemplate aerial light sources.

6.3.2 General assumptions for this technical paper

6.3.2.1 Air traffic assumptions for this assessment

Air traffic generally

Air traffic can be viewed as it flies overhead and when it passes through views to WSI. These views are therefore transient, typically of short duration and viewed at varying distances.

Air traffic typically moves on a generally north-east to south-west axis approaching and departing from the main runway (05/23). This means that a considerable amount of air traffic will be viewed across western Sydney, or along a corridor to the north-east and south-west along the runway axis. It can be generally assumed that the greater the distance from WSI, the higher aircraft will be and therefore the less visually prominent these aircraft are in views toward them.

Flight paths and corridor

Aircraft do not fly in the same way as a train running on a linear railway track. Once in flight, the aircraft is subject to dispersion (as described in Chapter 3 (Introduction to airspace) of the EIS), which would influence where the aircraft would be in relation to the SID flight path, hence the flight paths are depicted as a flight path corridor. The corridor shows the flight path widening to notionally 2 km either side of the nominal centreline of the SID flight path, transitioning to notionally 5 km as the aircraft join the enroute flight network.

Flight frequency

The frequency of flights has been based on the data used for the noise assessment. The distribution of flights throughout the day and detailed flight scheduling is not yet known.

Altitude and existing landform

The description of flight altitude is usually an above sea level measurement. In Western Sydney, the landform varies up to 100 metres above sea level, which is not a material viewing height when considering the altitude of visible flights (refer to in Table 6.10). At the Blue Mountains, however, where there is substantial increase in the height of the landform, relative to sea level, the following assumptions have been made in relation to flight path altitudes (refer to in Table 6.11).

For the detailed landscape character and visual impact assessment, the heights provided in the noise tool have been used.

Table 6.10 Flight altitude and landform heights – Western Sydney

Location	Height above sea level (metres)	Height above sea level (ft)	Flight path altitude (metres)	Flight path altitude (ft)
Penrith	32	105	750–320	2,500–10,500
Luddenham	106	348	>230	>750
Badgerys Creek	37	120	>230–3,200	>750–10,500
Orchard Hills	52	170	1,000–1,500	3,500–5,000
Greendale	57	187	7,500	2,500
Kemps Creek	78	255	3,200–4,000	10,500–13,300

Table 6.11 Flight altitude and height above landform – Blue Mountains

Location	Height above sea level (metres)	Height above sea level (ft)	Flight path altitude (metres)	Flight path altitude (ft)	Height above landform (metres)	Height above landform (ft)
Nattai wilderness area	540	1,772	1,500–4,000	5,000–13,300	1,450–3,460	3,228–11,528
Wilderness areas of the Nepean River	100	328	7,500	2,500	7,400	2,172
Nepean River and urban areas of western Sydney	30	98	1,500	5,000	1,470	4,902
Wilderness areas across Bowens Creek valley and Mt Tomah	900	2,952	3,200	10,500	2,052	2,300
Grose Valley north of Blue Gum Forest	820	2,690	3,200	10,500	2,380	7,810
Jamison Valley south of Echo Point lookout and Katoomba across Mt Solitary	200	656	4,000	13,300	3,800	12,644
Mt Solitary	927	3,041	3,200	10,500	2,273	7,459
Jamison Valley south of Wentworth Falls across Mt Solitary	235	770	3,200	10,500	2,965	9,730

Contrails

A contrail is a stream of condensed water from an aircraft flying at high altitude, sometimes seen as a white streak in the sky that eventually disappears. Contrails form when aircraft are at very high altitudes (normally above 26,000 feet (ft) or 8000 m), the air is very cold and there is a large amount of water vapor in the air (high humidity). Water droplets form ice particles, making up the white contrail. When atmospheric conditions become drier (lower humidity) the contrails evaporate and mix into the surrounding atmosphere. (Source: Condensation trails – Airservices (airservicesaustralia.com)

Contrails can currently be seen in the sky over western Sydney and over the Blue Mountains (Figure 6.4). At the altitudes contrails are formed, they form a small part of the view to the sky and can be seen in the context of clouds, which can reduce their visibility. However, as contrails typically form straight lines, and can be especially noticeable in sensitive natural areas such as the Greater Blue Mountains Area because they are linear features, unlike most natural clouds. While the formation of contrails is variable, when present they can draw attention to and increase the visibility of distant planes, particularly when there is heavy flight traffic, such as at peak times when there could be multiple contrails visible. Contrails can also remain for long periods of time after the plane has passed, from several seconds to hours, depending on atmospheric conditions.

Figure 6.4 Contrail visible above Wentworth Falls, Blue Mountains

Flights at night

The assessment of visual impacts at night has been undertaken based on the 'night' flight paths, which are used between 11 pm and 5.30 am as well as the 'day time' flight paths which would be used during periods of darkness, between sunset and 11 pm. Aircraft typically have at least 3 flashing red and white navigation lights, which are more visible at night, however, actual lighting can vary and include red, green and white lights on the wingtips and tail which may be steady or flash, appearing visible at night. During final approach there are also landing lights which be steady or pulse/strobe and can be visible at some distance. Note, these lights may be used during dark conditions and not necessarily only at night.

Plane types

This assessment has considered views to jet planes only. In particular, a typical large plane and a smaller plane representing the likely plane size that would most frequently operate at WSI. The B777 has been used as typical of the wide-body type of plane (about 73 metres long) predicted to fly to or from WSI. The smaller A320, at about 37.6 metres long, is likely to be typical of the more frequently flown jet planes at WSI. Refer to Figure 6.5. While not the most frequently flown, the B777 have been selected as these would be likely to cause the greatest landscape character and visual impact.

Figure 6.5 Scale of the B777 (left) and A320 (right) planes

Chapter 7 Landscape impact assessment

7.1 Assessment of landscape character zones – Western Sydney

While there is a diverse mosaic of landscapes within the landscape and visual study area of Western Sydney, 12 broad landscape character zones have been identified for the purposes of this assessment. These are based on the landscape character zones identified in the 2016 EIS and have been updated to reflect recent changes in the landscape and planned future landscape character. These areas generally have similar topography, vegetation type and cover, land use and built form (existing and emerging). The landscape character zones for Western Sydney include:

- Penrith rural south-west landscape character zone (LCZ1)
- Penrith south-east rural transition landscape character zone (LCZ2)
- Greendale and Silverdale rural and residential landscape character zone (LCZ3)
- Luddenham village and agricultural precinct character zone (LCZ4)
- Northern Gateway precinct landscape character zone (LCZ5)
- WSI landscape character zone (LCZ6)
- Badgerys Creek landscape character zone (LCZ7)
- Kemps Creek and Rossmore rural residential landscape character zone (LCZ8)
- Aerotropolis core precinct landscape character zone (LCZ9)
- Leppington rural residential landscape character zone (LCZ10)
- South Penrith urban area landscape character zone (LCZ11)
- Western Sydney Parklands landscape character zone (LCZ12).

The location of these landscape character zones is shown in Figure 7.1.

The following sections includes a description of the existing conditions and sensitivity of each landscape, as well as the magnitude of change expected because of the project, and assigns an impact level.

The impact on the landscape character of the Greater Blue Mountains is identified in Section 7.2.

The impact on the values of the GBMA, in relation to landscape character and visual amenity, has been identified in Chapter 9.

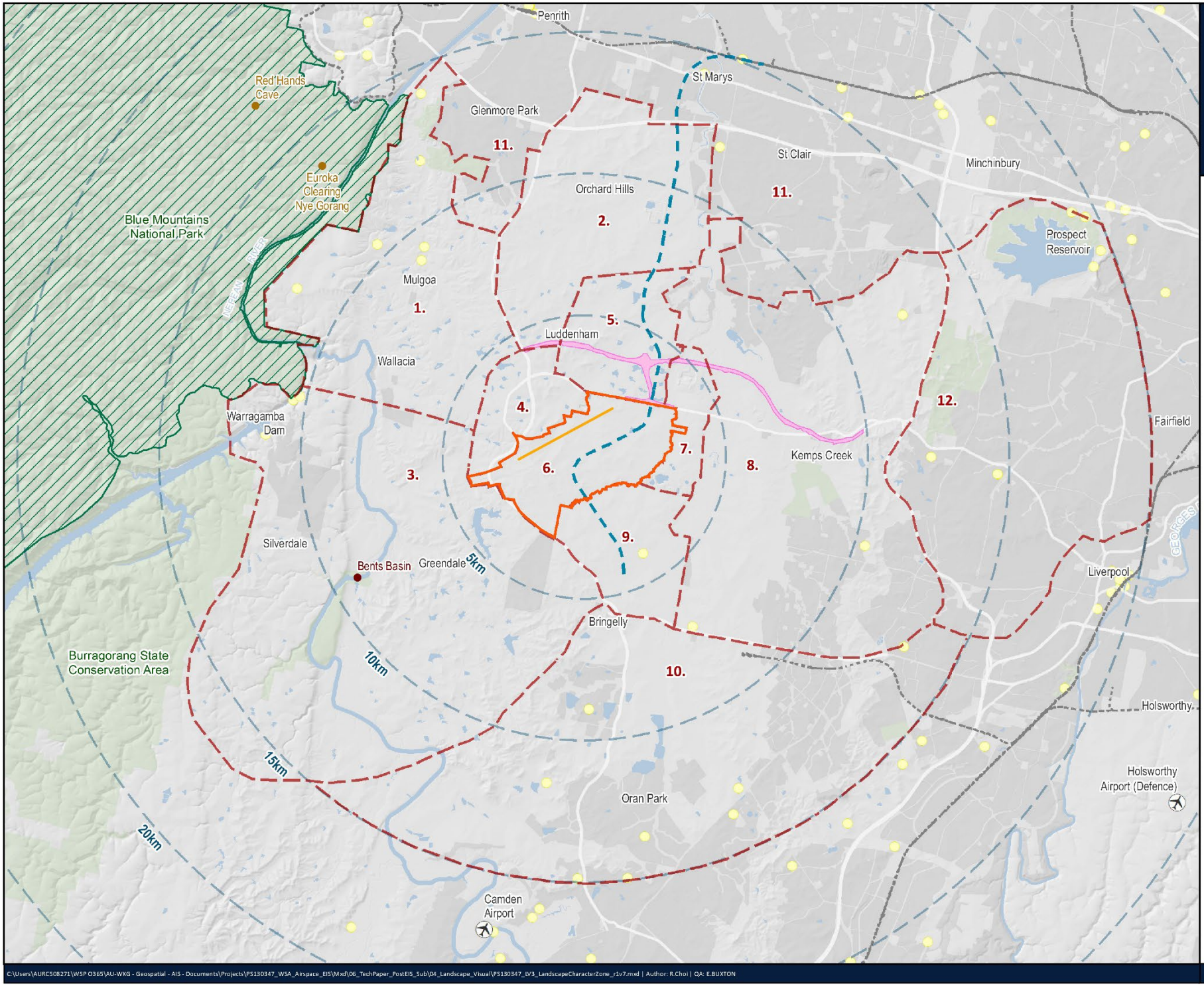


Figure 7.1

Landscape character plan - Western Sydney

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Landscape character zones
- Railway
- Proposed Sydney Metro
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

The corresponding character zones

1. Penrith rural south-west landscape character zone (LCZ1)
2. Penrith south-east rural transition landscape character zone (LCZ2)
3. Greendale and Silverdale rural and residential landscape character zone (LCZ3)
4. Luddenham village and agricultural precinct landscape character zone (LCZ4)
5. Northern Gateway precinct landscape character zone (LCZ5)
6. WSI landscape character zone (LCZ6)
7. Badgerys Creek landscape character zone (LCZ7)
8. Kemps Creek and Rossmore rural residential landscape character zone (LCZ8)
9. Aerotropolis core precinct landscape character zone (LCZ9)
10. Leppington rural residential landscape character zone (LCZ10)
11. South Penrith urban area landscape character zone (LCZ11)
12. Western Sydney Parklands landscape character zone (LCZ12).

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:175,000 Date: 15/08/2023

7.1.1 LCZ1 – Penrith rural south-west landscape character zone

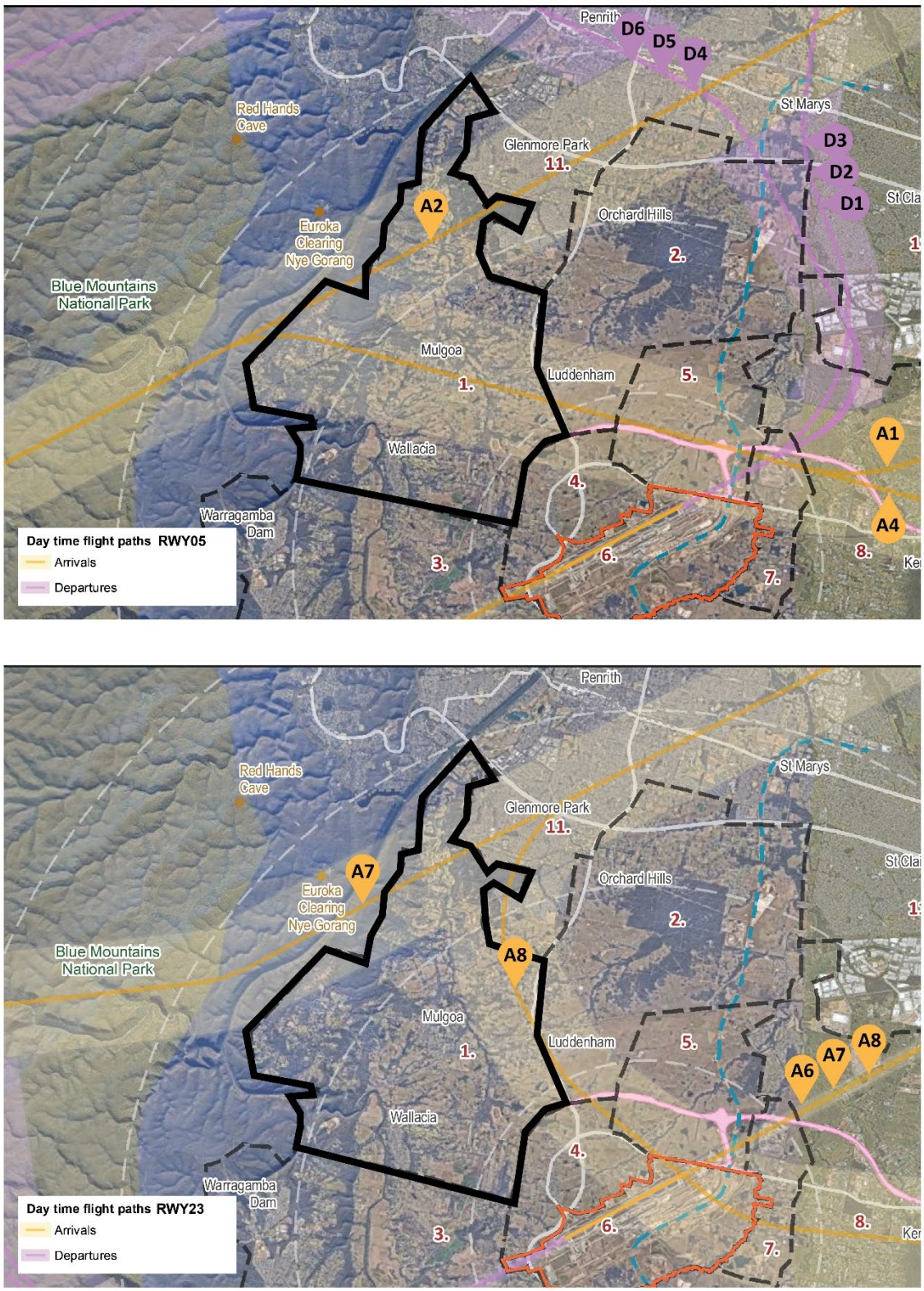


Figure 7.2 Location of LCZ1 Penrith rural south-west landscape character zone

7.1.1.1 Existing character (2022)

This landscape is broadly located along the eastern foothills of the Blue Mountains, encompassing the Nepean River valley, in the south-western part of the Penrith LGA. The landscape has significant environmental conservation lands which shape its character, including Blue Mountains National Park in the south-west and Mulgoa Nature Reserve. These areas provide 'picturesque views' across the rural landscapes and towards the Blue Mountains (Penrith City Council, 2022).

The Nepean River is an important element of scenic value, recognised throughout the LGA as a scenic and cultural landscape in the *Draft Rural Lands Strategy*. The Northern Road corridor is also identified as a scenic and cultural landscape of local significance (Penrith City Council, 2022).

The Mulgoa Valley includes several heritage items and sites of both local and State significance including rural homesteads such as Fernhill Estate, Fairlight, Glenleigh and Glenmore (SHR places). The aesthetic significance of Fernhill Estate is primarily due to… '*its rural landscape character, including a visual relationship with the Cox family's earlier house Mulgoa Cottage and church, St Thomas' Church of England'* (NSW SHI, 1980). The 423-hectare estate is owned by the NSW Government and will be restored and managed as a public park. Fernhill includes a historic homestead and outbuildings, gardens, open rural parklands, large reserves of natural bushland and creeks with walking trails and will be progressively opened to the public, as part of the Greater Sydney Parklands.

Glenmore is located on a rise in the foothills of Mulgoa Valley and is considered to be…. '*a landmark on Mulgoa Road'*, including a historic house, outbuildings, mature gardens within a landscaped setting, (NSW SHI, 1987). Fairlight is… '*an historic property located on a very elevated site with views across rolling landscapes to Sydney, the Nepean River gorge and to Camden and Mittagong'* (NSW SHI, 2004). Glenleigh is another rural estate, located in the Mulgoa Valley. Although the aesthetic significance of Glenleigh Estate is related to the house architecture and interiors (NSW SHI, 2008), the NSW SHI listing describes it as… '*an extremely important element in the landscape as seen from the Mulgoa Road, Western Freeway and western railway*' (NSW SHI, 2008).

This entire landscape is identified in the *Draft Rural Lands Strategy* as a Metropolitan Rural Area (MRA) and within the rural edge of Penrith (Penrith City Council, 2022). The landscape includes town settlements and places and features of local scenic value appreciated by locals.

This landscape character zone is overflown by flights from the Sydney (Kingsford Smith), Bankstown and Camden airports and other airports in the region, as well as flying training areas. This includes planes arriving or departing from the Bankstown and Camden airports. Whilst some of these overflights are high, flying training activity at lower altitudes is allowed in this area. This area is also located under the arrival and departure flight paths from Bankstown airport. Planes are likely to be seen in the airspace over this area, which influences the character of this landscape character zone.

7.1.1.2 Landscape impact during operation

Table 7.1 Impact during operation – LCZ1 Penrith rural south-west landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Landscape valued or experienced by concentrations of residents and places of local scenic value. Gentle landforms, modified natural waterways, scattered or sparsely vegetated with local heritage places, scattered dwellings and small villages.
2033 scenario		
Sensitivity	Low	This zone is within the MRA and should remain predominantly rural.
Magnitude of change	Low	This zone would be overflown by several arrival flights paths, including: • RWY05 arrivals (A1-A2 and A4), about 23 flights on average, up to a maximum of 55 flights, per day with planes likely to be at an altitude of about 5,000–8,000 ft (1.5–2.4 km) • RWY23 arrivals (A7-A8), about 32 flights on average, up to a maximum of 68 flights, per day, with planes likely to be at an altitude of about 5,000–8,000 ft (1.5–2.4 km). No departure flights would pass over this landscape character zone. Overall, while there would be several flight paths over this zone, planes on these flight paths would be relatively high and passing over at a relatively low frequency and there would be a slight change to the character of this zone.
Impact level	**Low**	
2055 scenario		
Sensitivity	Low	This zone is within the MRA and should remain predominantly rural.
Magnitude of change	Moderate	Planes would follow the same paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1-A2 and A4), about 59 flights on average, up to a maximum of about 138 flights, per day • RWY23 arrivals (A7-A8), about 93 flights on average, up to a maximum of abouts 184 flights, per day. While the height of planes would reduce their influence over the character of this zone, there would be a steady stream of flights as multiple arrival flight paths converge upon approach to the Airport Site. Overall, there would be a noticeable change to the character of this zone.
Impact level	**Moderate-Low**	

7.1.2 LCZ2 – Penrith south-east rural transition landscape character zone

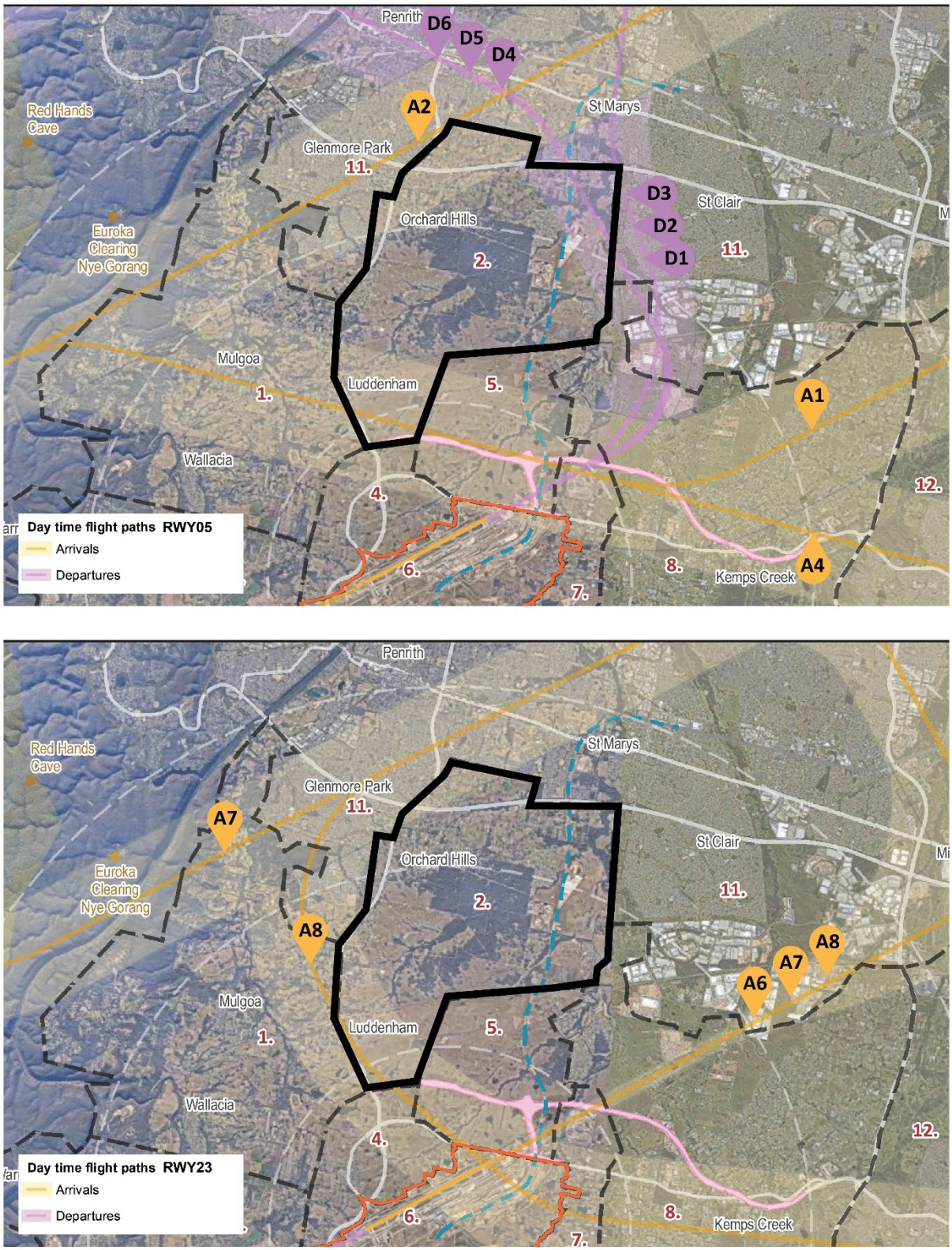


Figure 7.3 Location of LCZ2 Penrith south-east rural transition landscape character zone

7.1.2.1 Existing character (2022)

This landscape consists of established and planned urban areas of Penrith broadly encompassing the suburbs of Orchard Hills, Kemps Creek, Mount Vernon, Badgerys Creek and Luddenham. While currently rural land, a large part of this zone will eventually transform and develop into urban areas with associated infrastructure including:

- residential development emerging within the Orchard Hills Urban Investigation Area
- major infrastructure projects such as Sydney Metro Western Sydney Airport, Western Sydney Freight Line and the Outer Sydney Orbital.

The Orchard Hills Metro Station is proposed in the northern part of this landscape, to service a future commercial and mixed-use precinct, as well as a train facility further to the south, for stabling and maintenance.

South Creek will remain as the main green break within this zone, to provide visual relief from the future urban landscape (Penrith City Council, 2022). The Orchard Hills defence site, while primarily used for defence purposes, plays an important conservation role with much of the vegetation on the site protected as an offset to the impacts of WSI. This part of the landscape, comprising the Orchard Hills defence site, is identified in the Draft Rural Lands Strategy as a Metropolitan Rural Area (MRA) and within the rural edge of Penrith (Penrith City Council, 2022). In addition, the part of Orchard Hills surrounding the M4 Motorway is identified as a highly visually sensitive landscape. In particular, views from the M4 Motorway to the south are identified as important in the *Draft Rural Lands Strategy*. Westerly views from this landscape to the Blue Mountains are also identified as important (Penrith City Council, 2022).

This landscape character zone is currently overflown by flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region, as well as flying training areas. This includes planes arriving or departing from the Bankstown and Camden airports, with the departure flight path from Bankstown airport passing over this area. Whilst some of these overflights are high, there is also some flying training activity at lower altitudes. Planes are likely to be seen in the airspace over this area, which influences the character of this landscape character zone.

7.1.2.2 Landscape impact during operation

Table 7.2 Impact during operation – LCZ2 Penrith south-east rural transition landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Moderate	Landscape identified as having particular scenic value. Includes locally distinctive landform features and protected vegetation.
2033 scenario		
Sensitivity	Moderate	While the density of residential development may increase in this area, increasing the number of viewers, the sensitivity level would remain as moderate due to the values placed on this landscape.
Magnitude of change	Low	The area in the south west and north eastern corner of this character zone would be overflown by several flight paths, including planes: • RWY05 arrivals (A1, A2 and A4), with 23 flights on average, up to a maximum of 55 flights, per day, with planes likely to be at an altitude between 8,000–10,500 ft (2.4–3.2 km) • RWY05 departures (D4-D6), with 15 flights on average, up to a maximum of 37 flights, per day with planes likely to be at an altitude between 2,500–5,000 ft (about 750 metres–1.5 km) • RWY23 arrivals (A8), about 8 flights on average, up to a maximum of 17 flights, per day, with planes likely to be at an altitude of about 5,000–8,000 ft (1.5–2.4 km). This character zone would mostly not be overflown with flights crossing both the southern corner and the north eastern corner of this landscape character zone. The planes in the northeast would be relatively low in the sky and have a greater influence over the character of the zone. Overall, there would be a slight change to the character of this zone.
Impact level	**Moderate-Low**	
2055 scenario		
Sensitivity	Moderate	
Magnitude of change	Moderate	Planes would follow the same paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1, A2 and A4), 59 flights on average, up to a maximum of 138 flights, per day in the southern corner • RWY05 departures (D4-D6), 46 flights on average, up to a maximum of 104 flights, per day • RWY23 arrivals (A8), about 24 flights on average, up to a maximum of abouts 48 flights, per day. Overall, the increase in flights crossing over the northern and southern part of this zone would increase the presence of planes and result in a noticeable change to the character of this zone.
Impact level	**Moderate**	

7.1.3 LCZ3 – Greendale and Silverdale rural and residential landscape character zone

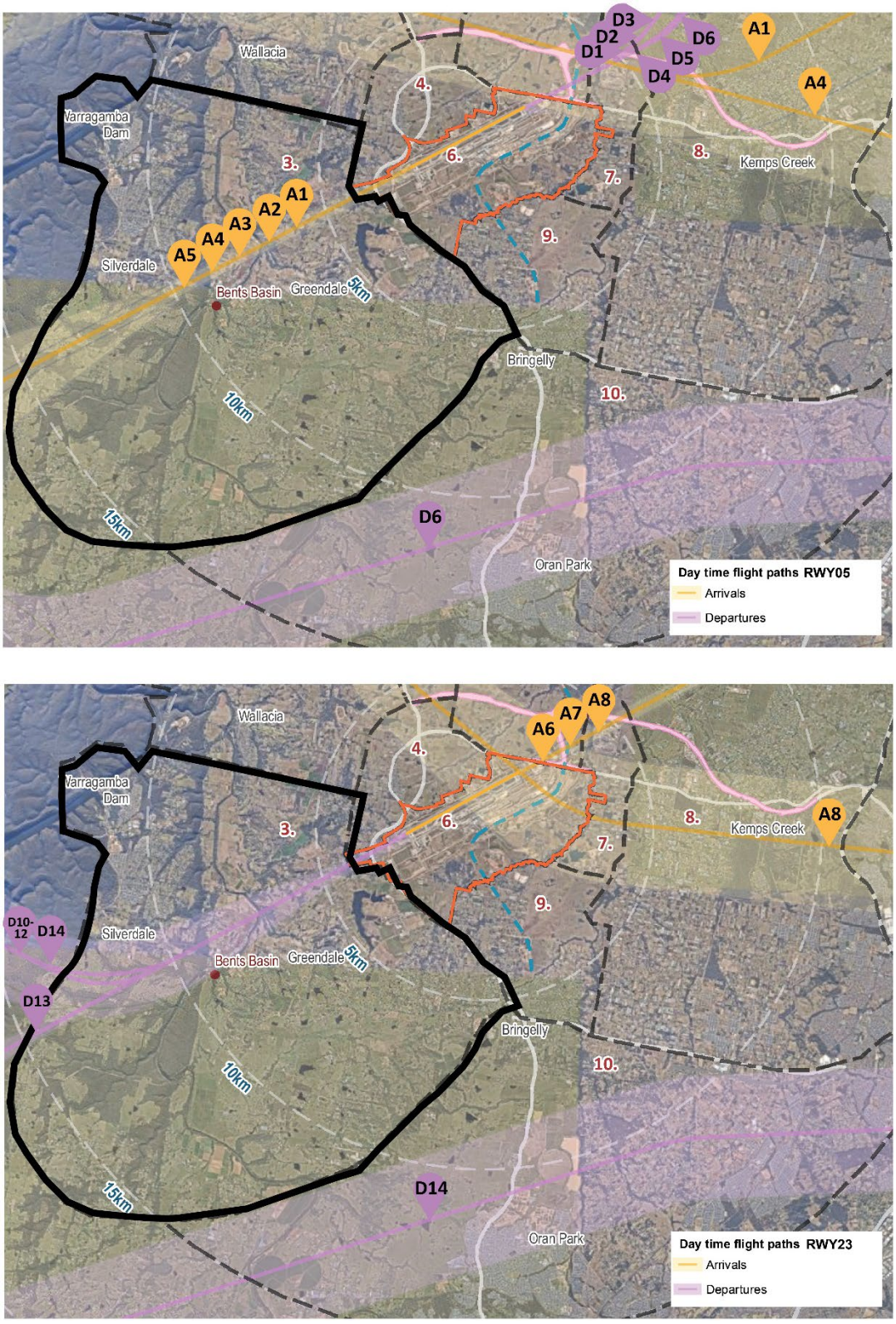


Figure 7.4 Location of LCZ3 Greendale and Silverdale rural and residential landscape character zone

7.1.3.1 Existing character (2022)

This landscape is located to the south-west of WSI, comprising the rural and suburban areas of Greendale, Silverdale and Warragamba along the Nepean River valley. The majority of this landscape is zoned for primary production and is characterised by acreage lots and small farms on gently undulating landform. The landscape has been mostly cleared for rural use, including a mix of open pastures and arable farmland, with small storage dams and trees generally located along roads, fence lines and water courses.

The southern part of this landscape includes the University of Sydney's Camden farm, used for teaching and research as a demonstration mixed enterprise farm. Gulguer Nature Reserve and Bents Basin State Conservation Area are located along the Nepean River comprising dense native bushland and walking trails. The western elevated part of this landscape includes recently development suburban areas of Silverdale and older residential areas of Warragamba, extending north and south of Warragamba local centre.

This landscape character zone is overflown by flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region, as well as flying training areas. This includes planes arriving or departing from Bankstown and Camden airports. The suburbs of Greendale and Silverdale are located under a departure flight path from Bankstown airport and flights arriving at Camden airport, so planes are already visible from these areas, flying at higher altitudes. There would also be flight training activity of smaller planes at lower altitudes in the area. Combined, these planes would influence the character of this zone.

7.1.3.2 Landscape impact during operation

Table 7.3 Impact during operation – LCZ3 Greendale and Silverdale rural and residential landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Landscape valued or experienced by concentrations of residents and places of local scenic value. Gentle landforms, modified natural waterways, scattered or sparsely vegetated with local heritage places, rural residential areas and residential clusters.
2033 scenario		
Sensitivity	Low	This zone would remain in rural residential areas and residential use.
Magnitude of change	Moderate	The central part of this landscape zone would be overflown by several flight paths, including: • RWY05 arrivals (A1-A5), with about 36 flights on average, up to a maximum of about 87 flights, per day • RWY23 departures (D10-D14), with about 47 flights on average, up to a maximum of about 95 flights, per day. The planes along these flight paths would likely be at lower altitudes due to landing and take-off (less than about 2,500 ft (about 760 metres)). Overall, due to the frequency and lower altitudes, planes would result in a noticeable change to the character of this zone.
Impact level	**Moderate-low**	
2055 scenario		
Sensitivity	Low	This zone would remain in rural residential areas and residential use.
Magnitude of change	High	Planes would follow the same flight paths through the central part of this landscape with the frequency of flights increasing, including: • RWY05 arrivals (A1-A5), to121 flights on average, up to a maximum of about 274 flights, per day • RWY23 departures (D10-D14), to 141 flights on average, up to a maximum of about 267 flights, per day. Overall, due to the increase in flight numbers, the project would result in a substantial change to the character of this zone.
Impact level	**Moderate**	

7.1.4 LCZ4 – Luddenham village and agricultural precinct landscape character zone

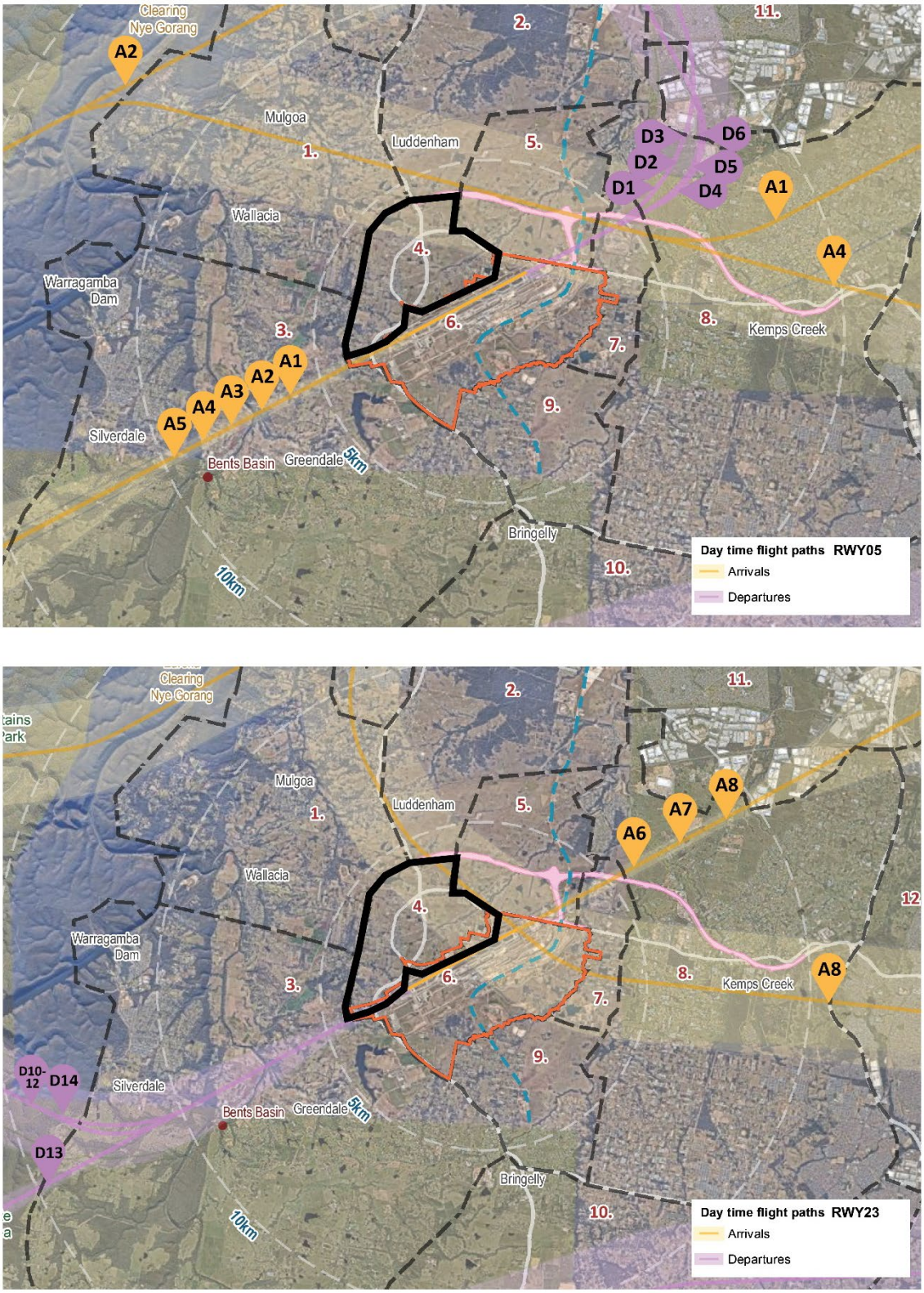


Figure 7.5 Location of LCZ4 Luddenham village and agricultural precinct landscape character zone

7.1.4.1 Existing character (2022)

This landscape is located to the west of WSI and includes the historic village of Luddenham, surrounded by agricultural production areas. Strategic planning is currently underway for Luddenham Village, to ensure the village grows as a local centre to support WSI, whilst maintaining the historic village character, which contains several local heritage items such as Luddenham Progress Hall, St James Anglican Church and Cemetery, and the Luddenham Public School, all local landmarks. The village is located partly on elevated land, along Old Northern Road. This road is intended to evolve into a 'main street' lined with retail, hospitality and commercial development, and tree-lined, providing shade and contributing to the landscape character of place (NSW DPE, 2020). Village gateways are proposed at the northern and southern ends of the village, at the junction of Park Road and Northern Road. The Luddenham Village Interim Strategy provides the following vision for Luddenham village:

> *'Luddenham Village will be the historical and cultural heart of the Agribusiness Precinct. It will be a vibrant and sustainable community retaining its village character and celebrating its rich history, its vistas and views and its connection to Country. It will also embrace the future and its role to support the growth of the broader Aerotropolis as well as the Agribusiness Precinct. The Old Northern Road will transform into an inviting and attractive spine through the village activated by shops and businesses, creating a highly pedestrianised and cycle-friendly environment.' (NSW DPE, 2022c)*

An enterprise zone is proposed at the northern end of this landscape character zone, adjacent to the Northern Gateway, including large blocks to accommodate development such as logistics, food production and processing development. Elsewhere, agribusiness uses are anticipated throughout much of the precinct, with maximum buildings heights of 20 metres. A network of open space and parkland is proposed to follow existing creek lines. Duncans Creek reservoir will also be rehabilitated, providing passive recreation for workers, visitors and nearby residents.

The upgrade of Northern Road has relocated this road to the east of Luddenham village, bypassing the village. It consists of a 4-lane divided road with a central median, linking between Bringelly and Luddenham North, intersecting major roads such as Elizabeth Drive and Bringelly Road, to provide increased capacity to cater for future population growth around WSI.

There is air traffic across this area with flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region. Part of this area is also overflown by flying training areas based around Bankstown and Camden airports. While some of these overflights are high, the flight training activity can occur at lower altitudes. Luddenham is located under a departure flight path from Bankstown airport. Combined, these planes would influence the character of this zone.

7.1.4.2 Landscape impact during operation

Table 7.4 Impact during operation – LCZ4 Luddenham village and agricultural precinct landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Moderate	Gentle landforms, modified natural waterways, scattered or sparsely vegetated with local heritage places, dense residential areas and village.
2033 scenario		
Sensitivity	Moderate	Landscape heavily used and valued by concentrations of residents. While the future Enterprise Zone would reduce the sensitivity of this zone, the village would remain moderate sensitivity due to the density of residential development.
Magnitude of change	Moderate	This area is in close proximity to WSI but would only be overflown in the northeast of Luddenham village, including: • RWY23 arrival (A8), about 8 flights on average, up to a maximum of about 17 flights, per day with planes likely to be at an altitude of about 5,000–8,000 ft (1.5–2.4 km). While there are few overflights, there would be views to low flying planes approaching and departing the runway seen from some areas of this character zone. Overall, the project would result in a noticeable change to the character of this zone.
Impact level	**Moderate**	
2055 scenario		
Sensitivity	Moderate	This zone would continue to include residential areas and the Luddenham village.
Magnitude of change	High	Planes would follow the same flight paths with the frequency of flights increasing, including: • RWY23 arrival (A8), to about 24 flights on average, up to a maximum of about 48 flights, per day. Overall, while this character area is not overflown by many flight paths, due to the proximity of the runway and increase in flights arriving and departing the runway in close proximity, the project would result in a substantial change to the character of this zone.
Impact level	**High-Moderate**	

7.1.5 LCZ5 – Northern Gateway precinct landscape character zone

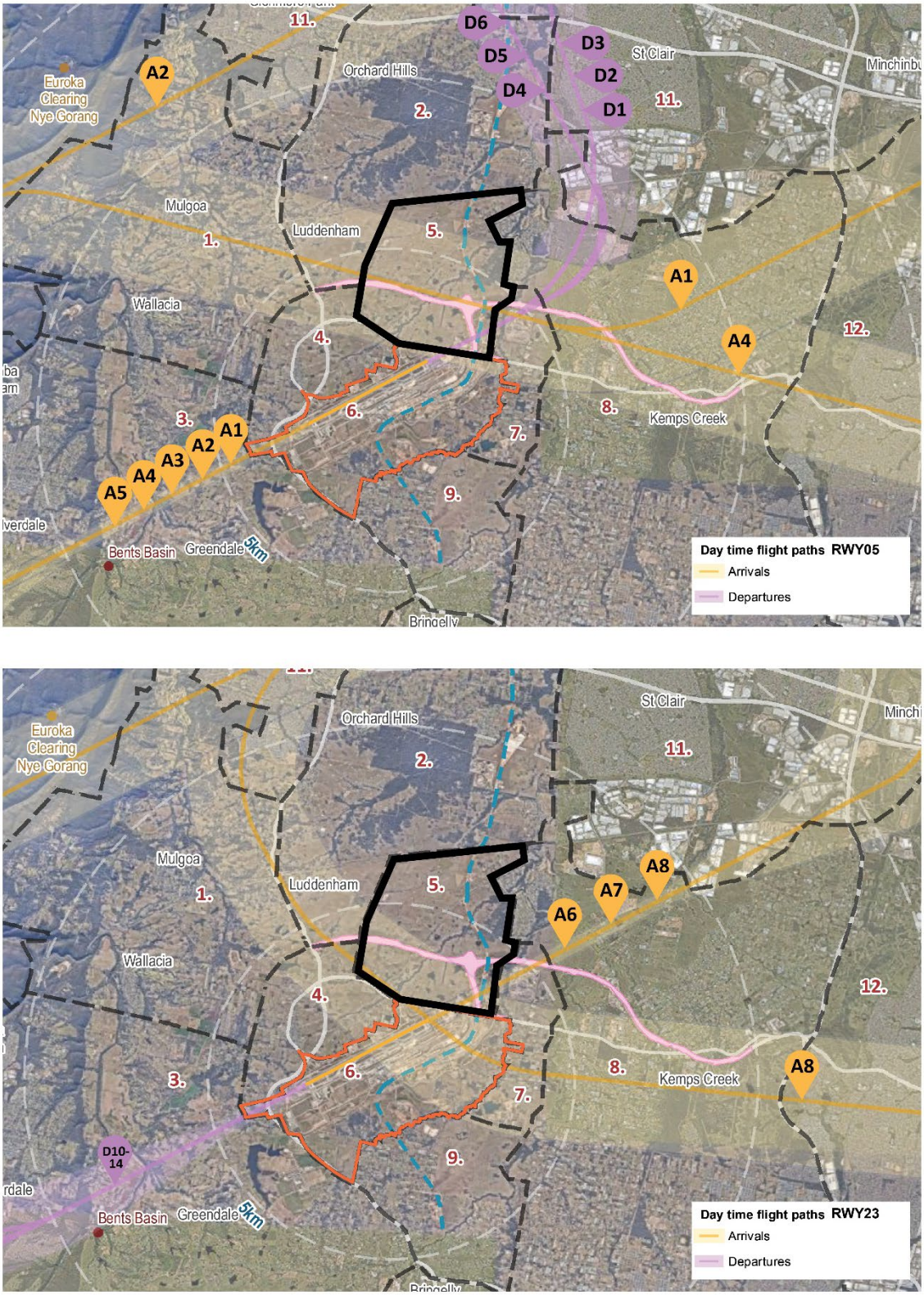


Figure 7.6 Location of LCZ5 Northern Gateway precinct landscape character zone

7.1.5.1 Existing character (2022)

This landscape is located to the north of WSI, between Elizabeth Drive and the Warragamba pipeline. Although it is largely rural, the Northern Gateway will develop as an employment precinct to support WSI, including development such as freight and logistics, warehousing and manufacturing, as well as an open space network aligned with existing creek lines, providing a range of environmental and recreation functions. The Northern Gateway will be a major interface for WSI and a specialised centre linking WSI with metropolitan areas to the north. It will expand from the approved Sydney Science Park, which comprises a town centre with commercial buildings and housing, and transition into an employment precinct, with supporting residential areas where land is not severely affected by aircraft noise. Residential mixed use will be medium and higher density, with building heights permitted up to 45 metres.

The proposed Sydney Metro Luddenham Station would be located near Luddenham Road, between the Warragamba pipeline and the new airport. The station would be designed to support the future employment, research and knowledge-based employment precinct in Luddenham, along with mixed-use residential development with access to jobs, transport and green space.

Proposed M12 Motorway is located in the centre of this landscape, which will connect to Sydney's motorway network and provide direct access to WSI. Construction has started on the west and central sections of the M12, between The Northern Road, Luddenham and Duff Road, Cecil Park.

There is air traffic across this area with flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region. Part of this area is also overflown by flying training areas based around Bankstown and Camden airports. While some of these overflights are high, the flight training activity occurs at lower altitudes. The Northern Gateway precinct is located under an arrival and departure flight path to Bankstown airport. Combined, these planes would influence the character of this zone.

7.1.5.2 Landscape impact during operation

Table 7.5 Landscape impact – LCZ5 Northern Gateway precinct landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Gentle landforms, modified natural waterways, scattered or sparsely vegetated with local heritage places, scattered dwellings and small residential development clusters.
2033 scenario		
Sensitivity	Very low	This area will transition to an employment precinct and reduce in sensitivity. Landscape would not have any particular scenic value or local landscape features.
Magnitude of change	Moderate	This zone would be overflown by several flight paths including: • RWY05 arrivals (A1 and A4), with about 15 flights on average, up to a maximum of about 36 flights, per day • RWY05 departures (D1-D6), with about 38 flights on average, up to a maximum of about 92 flights, per day • RWY23 arrivals (A6-A8) with about 48 flights on average, up to about 105 flights, per day. The planes in the southern part of this zone would likely be at lower altitudes due to landing and take-off (less than about 2,500 ft (760 metres)), whereas the flights in the central part of this zone would likely be at higher altitudes (between 8,000–10,500 ft (2.4–3.2 km)). Overall, due to the proximity of this area to WSI the frequency and lower altitudes of flights, the project would result in a noticeable change to the character of this character zone.
Impact level	**Low**	
2055 scenario		
Sensitivity	Very low	This area would continue to be an employment precinct.
Magnitude of change	Moderate	Planes would follow the same flight paths and altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1 and A4) to about 40 flights on average, up to a maximum of about 93 flights, per day • RWY05 departures (D1-D6), to about 115 flights on average, up to a maximum of about 262 flights, per day • RWY23 arrivals (A6-A8), to about 139 flights on average, up to a maximum of about 273 flights, per day. Overall, the project would result in a noticeable change to the character of this zone.
Impact level	**Low**	

7.1.6 LCZ6 – WSI landscape character zone

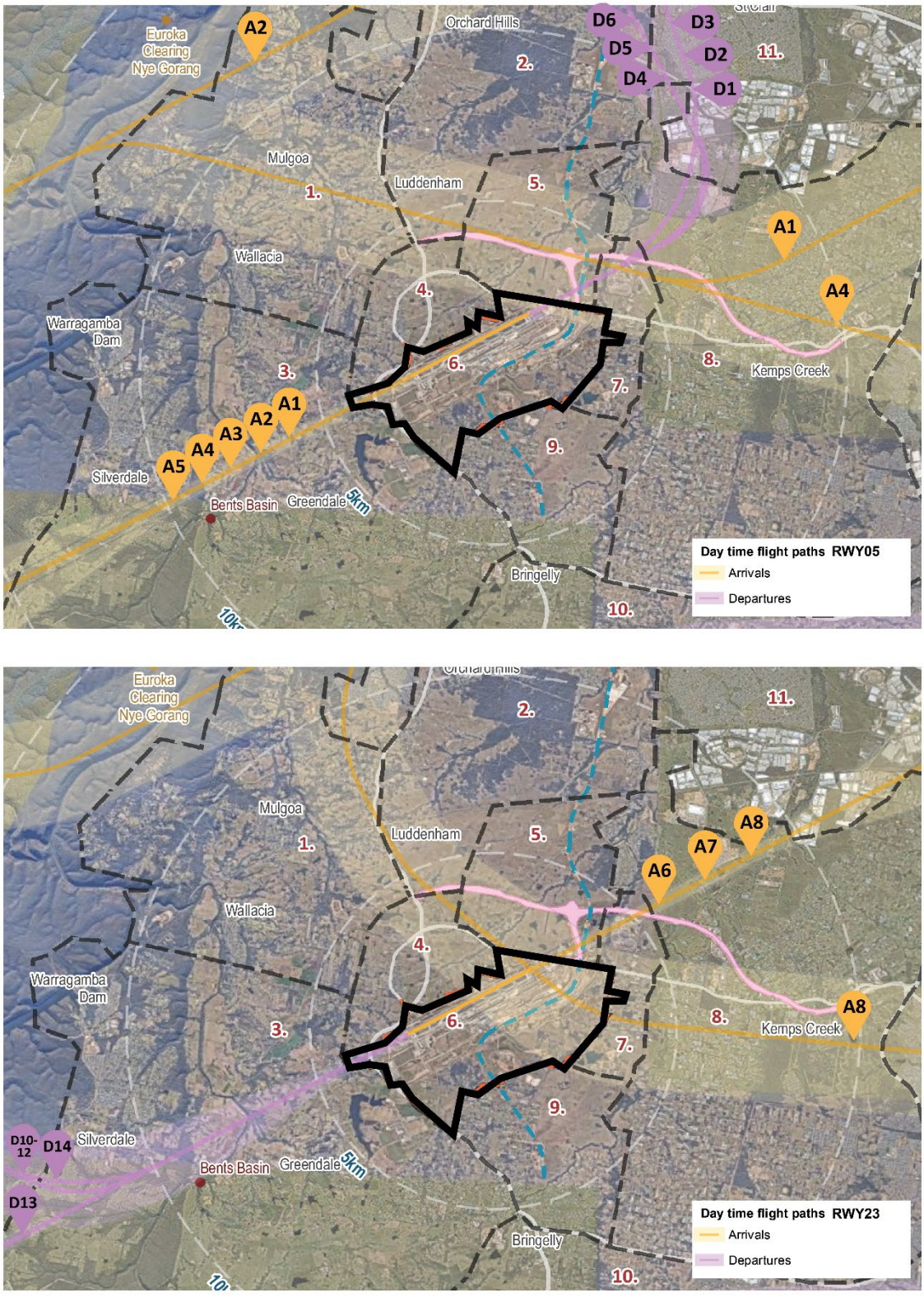


Figure 7.7 Location of LCZ6 WSI landscape character zone

7.1.6.1 Existing character (2022)

This landscape is in rapid transition, recently changing from a largely undulating rural area and towards a major international airport. Construction commenced in 2018 and WSI is planned to be in operation in 2026. Early earthworks have finished and the major earthworks at WSI are near complete. Construction is in progress for the main airport terminal, as well as the airside civil and pavement works, including the first runway, taxiways and roads.

This landscape will include 2 Metro stations, including Airport Business Park station and Airport Terminal Station with construction already commenced. The new Airport Terminal Station will integrate with and support design outcomes for WSI and maintain flexibility for future airport expansion. The Airport Business Park Station precinct will become a major employment and services hub and key interchange for customers working in the local area.

There is air traffic currently operating across this area with flights from the Sydney (Kingsford Smith) and Bankstown airports, as well as flying training areas with planes arriving or departing from Bankstown and Camden airports. Whilst some of these overflights are high, there is some flight training activity at lower altitudes in the area, influencing the character of this zone.

7.1.6.2 Landscape impact during operation

Table 7.6 Landscape impact – LCZ6 WSI landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Very low	Highly modified landscape, with a dominating presence of development, including current construction of WSI and runway, airport terminal building, roads, the metro and associated infrastructure. This landscape would not have any particular scenic value of local landscape features.
2033 scenario		
Sensitivity	Very low	By this time WSI and surrounding technology precinct will be constructed however it will continue to be a highly modified landscape dominated by intensive development. This landscape would not have any particular scenic value of local landscape features.
Magnitude of change	Negligible	Planes would be using the runway for take-off and landing in increasing numbers. This activity would be consistent with the character of an airport.
Impact level	**Negligible**	
2055 scenario		
Sensitivity	Very low	This area would be an airport and technology precinct with a highly modified landscape dominated by intensive development. This landscape would not have any particular scenic value of local landscape features.
Magnitude of change	Negligible	Planes would be using the runway for take-off and landing in increasing numbers. This activity would be consistent with the character of an airport.
Impact level	**Negligible**	

7.1.7 LCZ7 – Badgerys Creek landscape character zone

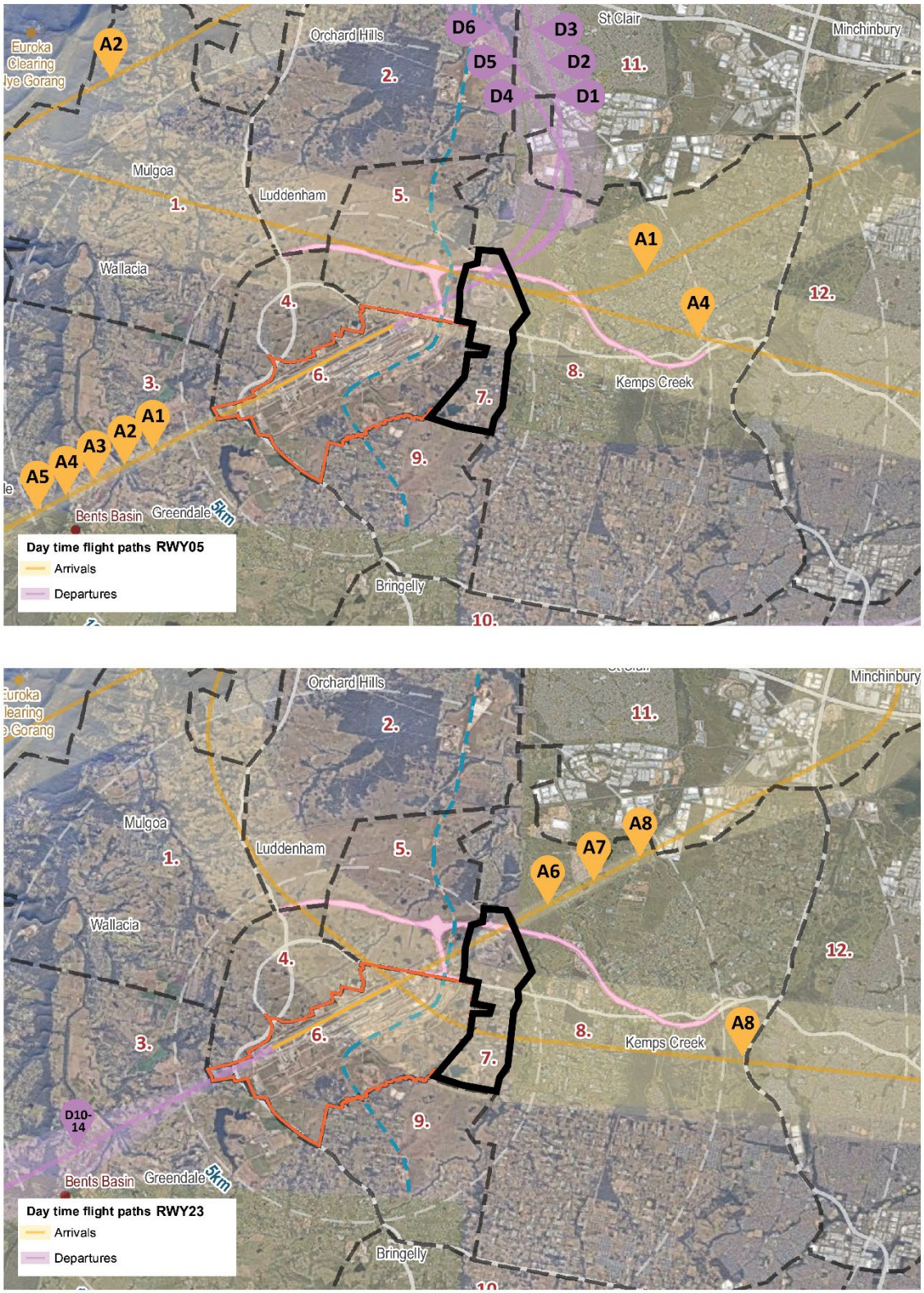


Figure 7.8 Location of LCZ7 Badgerys Creek landscape character zone

7.1.7.1 Existing character (2022)

This landscape is generally located to the east of WSI, between Badgerys Creek and Wianamatta-South Creek corridors, which run north-south through this zone. This landscape currently includes large lot rural residential and small lot agricultural uses.

This zone will transform from a largely rural landscape to intensive technology, manufacturing and industry uses adjacent to WSI. Affected by future aircraft noise, this landscape will not be suitable for noise sensitive land uses such as residential development. It will provide land for a range of employment generating uses that will benefit from proximity to WSI, with building heights permitted up to 24 metres.

There is air traffic across this area with flights from the Sydney (Kingsford Smith) and Bankstown airports as well as flying training areas, with planes arriving or departing from Bankstown and Camden airports. Whilst some of these overflights are high, there is flight training activity at lower altitudes in the area. Badgerys Creek is also located under a departure flight path from Bankstown airport. These flights influence the character of this zone somewhat.

7.1.7.2 Landscape impact during operation

Table 7.7 Landscape impact – LCZ7 Badgerys Creek landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Landscape valued by concentrations of residents with local landscape features. Gentle landforms, modified natural waterways, scattered or sparsely vegetated with dwellings scattered across large lot rural residential and small lot agricultural uses.
2033 scenario		
Sensitivity	Very low	Sensitivity would reduce due to transition to intensive technology, manufacturing and industry uses, designed and planned to support WSI. While the creeks are valued, and would remain, the occupied areas of this landscape would be a less valued for scenic quality.
Magnitude of change	Low	This zone would be overflown by several flight paths, including: In the northern part of this zone: • RWY05 arrivals (A1 and A4), with about 15 flights on average, up to a maximum of about 36 flights, per day with planes likely to be at an altitude of between 13,300–10,500 ft (4–3.2 km) • RWY05 departures (D1-D6), up to about 38 flights on average, up to a maximum of about 92 flights, per day with planes likely to be at an altitude of between 2,500–750 ft (760–230 metres) • RWY23 arrivals (A6-A8), with 48 flights on average, up to a maximum of about 105 flights, per day with planes likely to be at an altitude of between 2,500–750 ft (760–230 metres). The central part of this zone: • RWY23 arrivals (A8), with about 8 flights on average, up to a maximum of about 17 flights per day, with planes likely to be at altitudes of between 8,000–10,500 ft (2.4–3.2 km). Overall, while the project would introduce lower flying aircraft, there would be a slight change to the character of this zone as this activity would be consistent with the character of airport associated development.
Impact level	**Negligible**	

	Assessment level	Details
2055 scenario		
Sensitivity	Very low	This area would continue to comprise intensive technology, manufacturing and industry uses. While the creeks are valued, and would remain, the occupied areas of this landscape would be a less valued for scenic quality.
Magnitude of change	Low	Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: In the northern part of this zone: • RWY05 arrivals (A1 and A4), to about 40 flights on average, up to a maximum of about 93 arrival flights, per day • RWY05 departures (D1-D6), to about 115 flights on average, up to a maximum of 262 departure flights, per day • RWY23 arrivals (A6-A8), to 139 flights on average, up to a maximum of 273 departure flights, per day. The central part of this zone: • RWY23 arrivals (A8), to about 24 flights on average, up to a maximum of 48 flights, per day. Overall, while the frequency of flights would increase, this would continue to result in a slight change to the character of this zone due to the compatibility of aircraft with airport related landscape character.
Impact level	**Negligible**	

7.1.8 LCZ8 – Kemps Creek and Rossmore rural residential landscape character zone

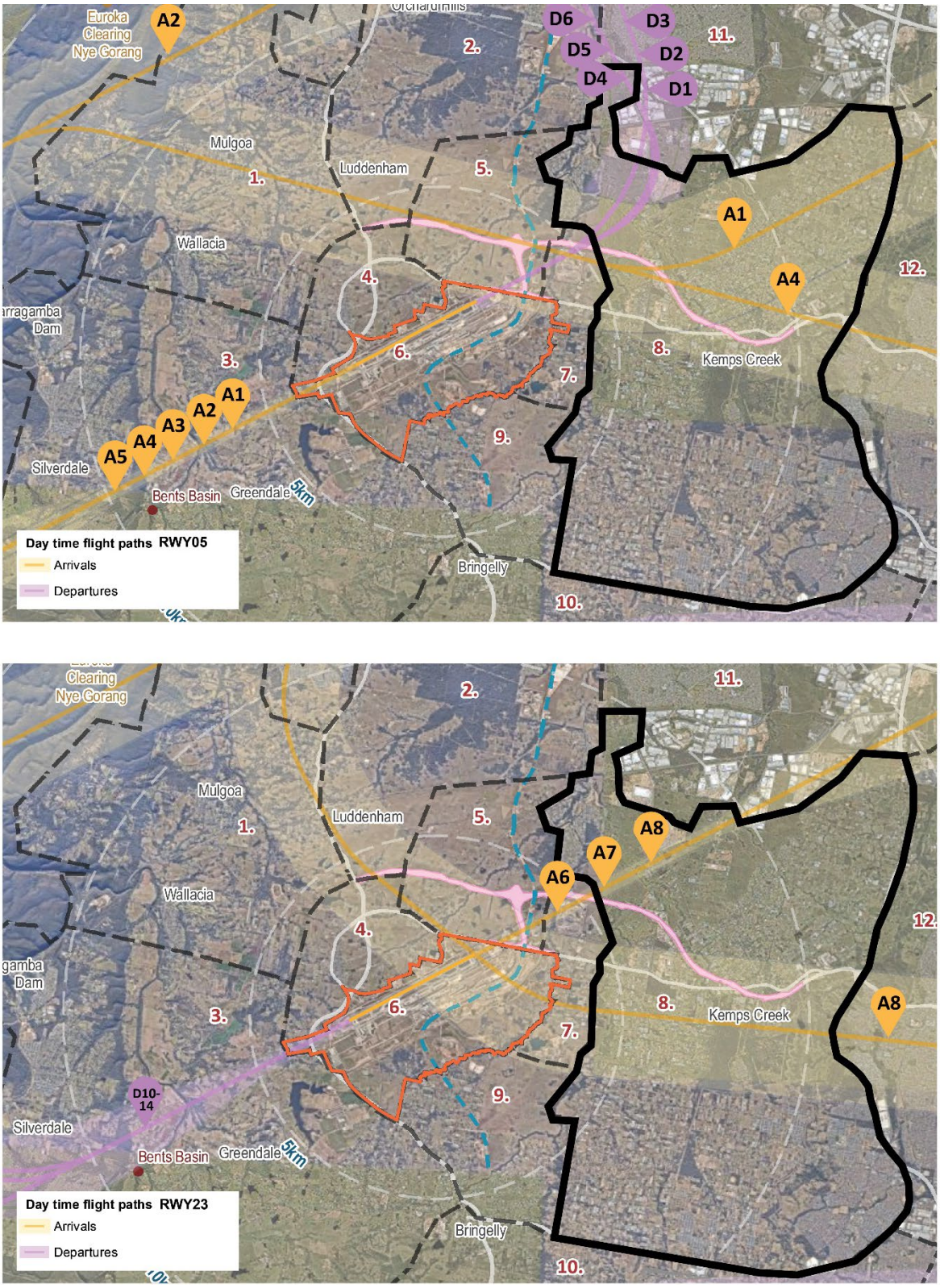


Figure 7.9 Location of LCZ8 Kemps Creek and Rossmore rural residential landscape character zone

7.1.8.1 Existing character (2022)

This landscape is located to east of WSI, including the Wianamatta-South Creek and Kemps Creek corridors and surrounding rural and residential areas of Kemps Creek and Rossmore. In the *Western Sydney Aerotropolis Precinct Plan* (NSW DPE, 2022b), the Wianamatta-South Creek corridor will develop over time as an interconnected blue-green network that comprises privately owned land, parks, sporting fields, waterways and potential permanent water bodies, walking trails and community facilities, providing a green break between surrounding urban development. Although much of the rural and residential area in this landscape is outside of the WSI land application boundary (refer to Figure 5.2, NSW DPE, 2022b), the planning intentions for southern rural areas are likely to transition to urban development as part of the South West Growth Area, one of 3 growth areas in South West Sydney, which adjoins the Western Sydney Aerotropolis and the Glenfield to Macarthur Urban Renewal Corridor. The northern part of this landscape will also change, transitioning from rural landscape character to industrial, forming part of the Western Sydney Employment Area to provide uses such as transport, logistics, warehousing and office space.

There is air traffic across this area with flights from the Sydney (Kingsford Smith) and Bankstown airports as well as flying training areas, with planes arriving or departing from Bankstown and Camden airports. Whilst some of these overflights are high, there is also flight training activity at lower altitudes in the area. Kemps Creek is also located under a departure flight path from Bankstown airport. Planes are operating in the airspace over this area, which influences the character of this zone.

7.1.8.2 Landscape impact during operation

Table 7.8 Landscape impact – LCZ8 Kemps Creek and Rossmore rural residential landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Gentle landforms, modified natural waterways, scattered or sparsely vegetated with dwellings scattered across large lot rural residential and small lot agricultural uses. Landscape valued and experienced by concentrations of residents and local recreational users.
2033 scenario		
Sensitivity	Low	Southern areas will transition to a more industrial areas, lowering the sensitivity, and the northern areas will contain further residential development, increasing the sensitivity of this landscape. Landscape would continue to be, in part, valued and experienced by concentrations of residents and local recreational users. Overall, the sensitivity would remain low.
Magnitude of change	Moderate	Overflown by several flights paths, including: In the northern part of this zone: • RWY05 arrivals (A1), about 8 flights on average, up to a maximum of about 19 flights, per day with planes likely to be at an altitude of between 13,300 ft and 10,500 ft (4–3.2 km) • RWY05 departures (D1-D6), about 38 flights on average, up to a maximum of about 92 flights, per day with planes likely to be at an altitude of about 2,500 ft (or 750 metres) • RWY23 arrivals (A6-A8), about 48 flights on average, up to a maximum of about 105 flights, per day with planes at an altitude of between 2,500–750 ft (760–230 metres).

	Assessment level	Details
		In the central part of this zone: • RWY05 arrivals (A4) about 7 flights on average, up to a maximum of about 17 flights, per day with planes likely to be at an altitude of 13,300 ft (about 4 km) • RWY23 arrivals (A8), about 8 flights on average, up to a maximum of 17 arrival flights, per day with planes likely to be at an altitude of 10,500 to 8,000 ft (about 3.2–2 km). Overall, the project would result in a noticeable change to the character of this zone.
Impact level	**Moderate-Low**	
2055 scenario		
Sensitivity	Low	This area would continue to include residential development and industrial areas lowering the sensitivity. This landscape would continue to be, in part, valued and experienced by concentrations of residents and local recreational users.
Magnitude of change	Moderate	Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: In the north: • RWY05 arrivals (A1) to about 19 flights on average, up to a maximum of 45 flights, per day • RWY05 departures (D1-D6) to about 115 flights on average, up to a maximum of about 262 departure flights, per day • RWY23 arrivals (A6-A8) to about 139 flights on average, up to a maximum of about 273 departure flights, per day. In the centre: • RWY05 arrivals (A4) to about 21 flights on average, up to a maximum of about 48 departure flights, per day • RWY23 arrivals (A8) to about 24 flights on average, up to a maximum of about 48 flights, per day. The frequency of approaching and departing flights at lower elevations particularly in the northern zone would increase. Overall, due to the increase in flight numbers, the project would result in a noticeable change to the character of this zone.
Impact level	**Moderate-Low**	

7.1.9 LCZ9 – Aerotropolis core precinct landscape character zone

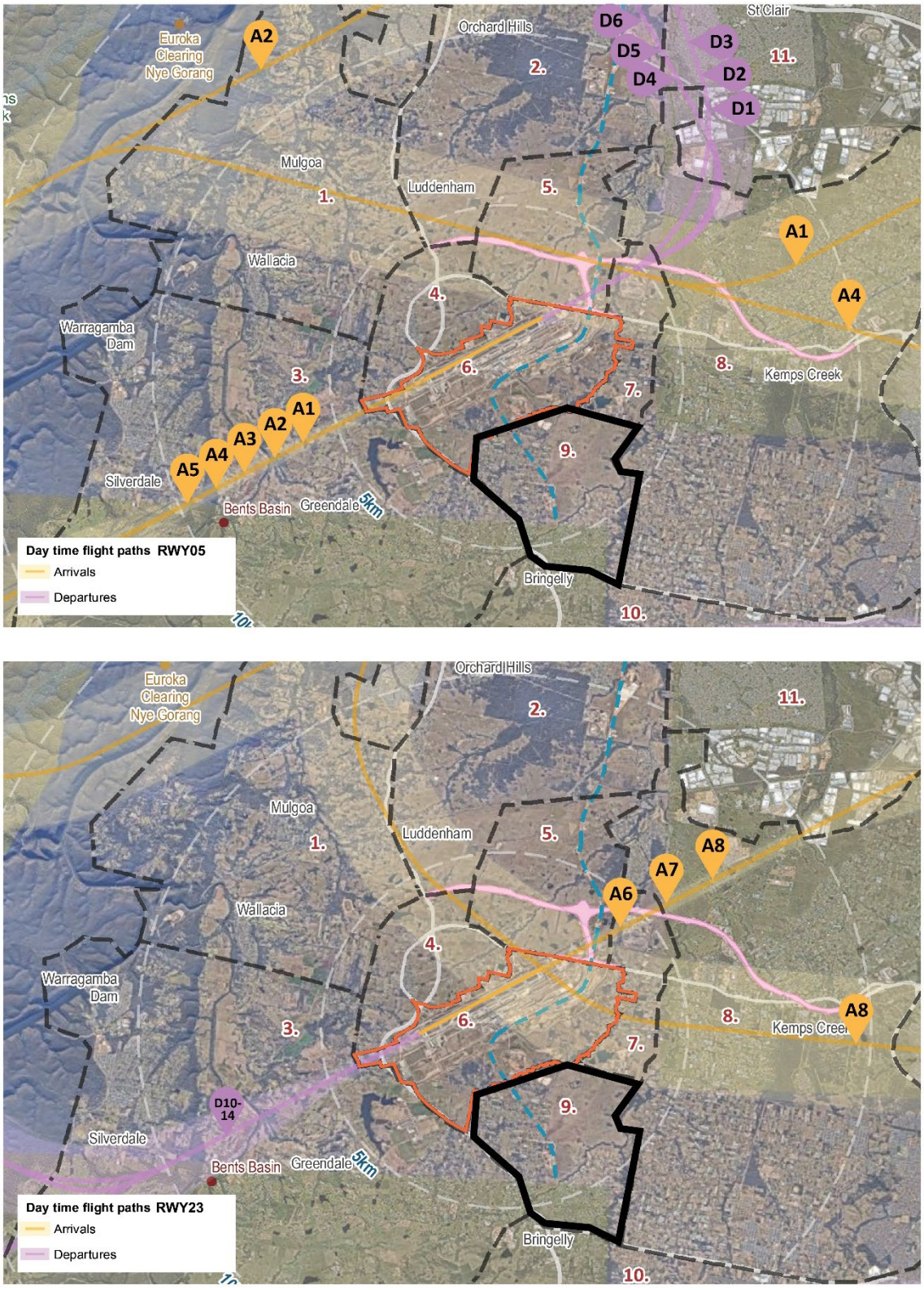


Figure 7.10 Location of LCZ9 Aerotropolis core precinct landscape character zone

7.1.9.1 Existing character (2022)

This landscape is generally located to the south-east of WSI, between the new airport and Bringelly Road. This landscape currently includes large lot rural residential and small lot agricultural uses.

This zone will transform from a largely rural residential landscape to a dense urban precinct planned around the proposed Aerotropolis Metro station. It will be defined by a new regional park system along Thompsons Creek and include a new City Centre (Bradfield) for the Aerotropolis. The future Aerotropolis Station would be located east of Badgerys Creek Road, serving the commercial heart of Western Sydney Aerotropolis, known as the Aerotropolis Core. The station would become a major transport interchange, providing important connectivity to the future new central business district of the Western Parkland City. While the land use focus for the Precinct is on employment and economic development, it will include residential development in areas not significantly affected by aircraft noise, near the new Metro station. Building heights of up to 70 metres in this precinct.

There is air traffic across this area with flights from the Sydney (Kingsford Smith) and Bankstown airports as well as flying training areas, with planes arriving or departing from Bankstown and Camden airports. Whilst some of these overflights are high, there is some flight training activity operating at lower altitudes. The Aerotropolis precinct is also located under arrival and departure flight paths from both Bankstown and Camden airports. Planes are visible in the airspace over this area, influencing the character of this landscape character zone.

7.1.9.2 Landscape impact during operation

Table 7.9 Landscape impact – LCZ9 Aerotropolis core precinct landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Landscape valued and experienced by concentrations of residents. Gentle landforms, modified natural waterways, scattered or sparsely vegetated with dwellings scattered across large lot rural residential and small lot agricultural uses.
2033 scenario		
Sensitivity	Moderate	The sensitivity of this landscape would increase as the land use transitions to include more urban development. This landscape would be heavily used and valued by a dense concentration of residents and recreational users.
Magnitude of change	Low	This zone would not be overflown by flight paths but would have views to planes in the distance, as close as 2 km to the runway, including all departure and arrival flights. Overall, the project would result in a slight change to the character of this zone.
Impact level	**Moderate-Low**	
2055 scenario		
Sensitivity	Moderate	This landscape would continue to be heavily used and valued by a dense concentration of residents and recreational users.
Magnitude of change	Low	This zone would not be overflown by flight paths but would have views to planes in the distance, as close as 2 km to the runway, including all departure and arrival flights, increasing in frequency from the 2033 scenario. Overall, the project would result in a slight change to the character of this zone.
Impact level	**Moderate-Low**	

7.1.10 LCZ10 – Leppington rural residential landscape character zone

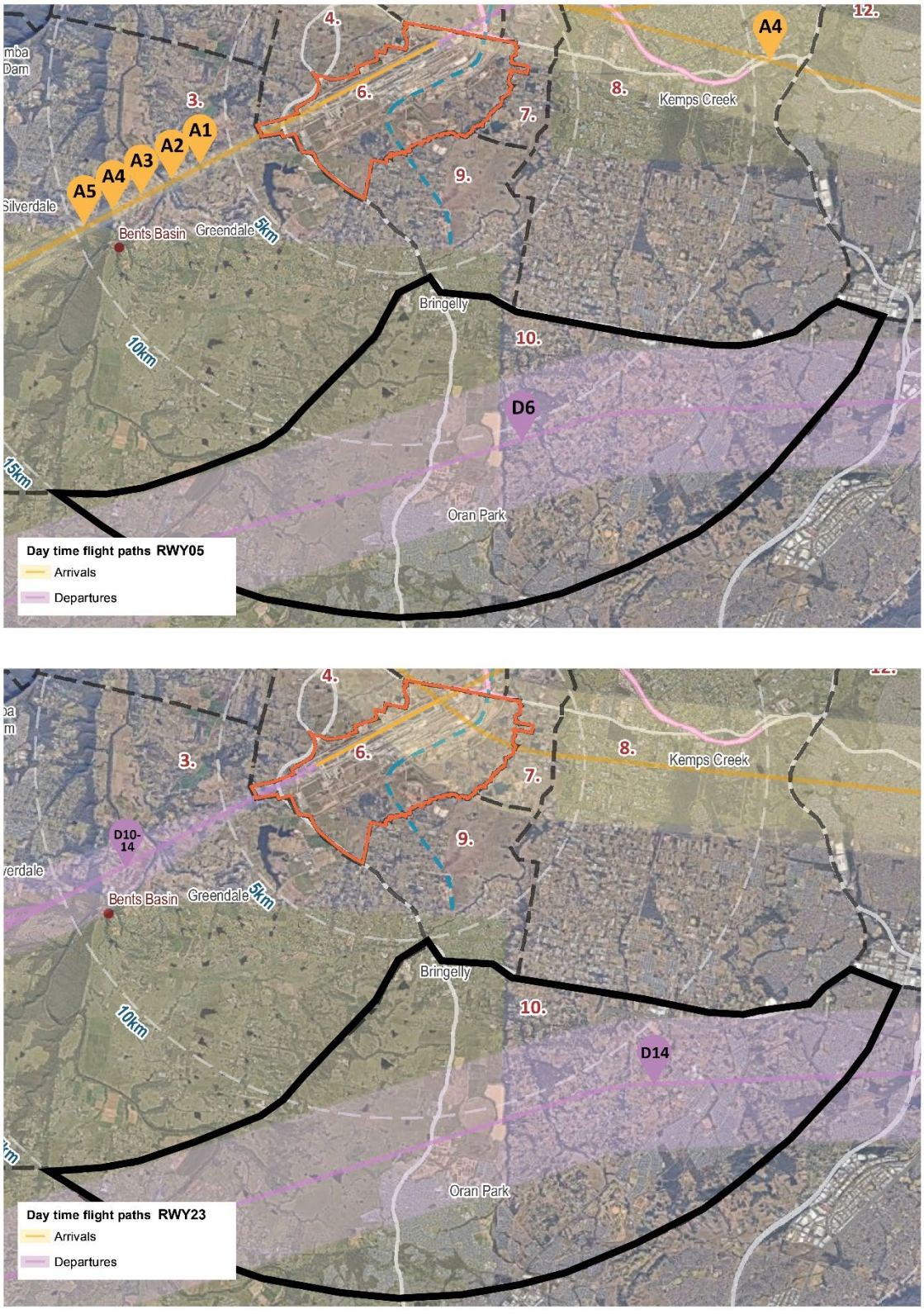


Figure 7.11 Location of LCZ10 Leppington rural residential precinct landscape character zone

7.1.10.1 Existing character (2022)

This landscape is located to the south of WSI, south of Bringelly Road. It is characterised by large, rural residential lots and farms on undulating topography. This landscape forms part of the South West Growth Area, adjoining the Glenfield to Macarthur Urban Renewal Corridor, and will include major urban development in the future, including a new town centre, new rail connections to WSI and Leppington, new low and medium density residential areas and major community facilities such as schools and sporting fields (NSW DPE, 2021).

There is air traffic across this area with flights from the Sydney (Kingsford Smith) and Bankstown airports as well as flying training areas, with planes arriving or departing from Bankstown and Camden airports. Part of this zone is also within the Camden airspace. Whilst some of these overflights are high, there are also some flight training activity at lower altitudes in the area. The Leppington area is also located under arrival and departure flight paths from both Bankstown and Camden airports. Planes are visible in the sky above this area, which influences the character of this precinct.

7.1.10.2 Landscape impact during operation

Table 7.10 Landscape impact – LCZ10 Leppington rural residential landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Low	Gentle landforms, modified natural waterways, scattered or sparsely vegetated with dwellings scattered across large lot rural residential and small lot agricultural uses. This landscape would be valued by concentrations of residents and recreational users and have local landscape features.
2033 scenario		
Sensitivity	Moderate	The sensitivity of this landscape would increase as the land use transitions to include more urban development and become a new Town Centre. This landscape would be heavily used and valued by a dense concentration of residents and recreational users.
Magnitude of change	Negligible	This zone would be overflown by: • RWY05 departures (D6), with 6 flights on average, up to a maximum of 17 flights, per day, with planes likely to be at an altitude of 20,000 ft (6 km) • RWY23 departures (D14), with about 8 flights on average, up to a maximum of about 17 flights, per day with planes likely to be at an altitude of 20,000 ft (6 km) or higher. No arrival flights would pass over this character zone. Overall, the project would not appreciably change the character of this zone.
Impact level	**Negligible**	
2055 scenario		
Sensitivity	Moderate	This zone would continue to be predominantly urban with a new Town Centre and continue to be heavily used and valued by a dense concentration of residents and recreational users.
Magnitude of change	Negligible	This zone would be overflown by the same flight paths at the same altitudes, with flights increasing in frequency, including: • RWY05 departures (D6), to about 25 flights on average, up to a maximum of about 57 flights, per day • RWY23 departures (D14) to about 30 flights on average, up to a maximum of about 57 flights, per day. No arrival flights would pass over this zone. Overall, the project would not appreciably change the character of this zone.
Impact level	**Negligible**	

7.1.11 LCZ11 – South Penrith urban area landscape character zone

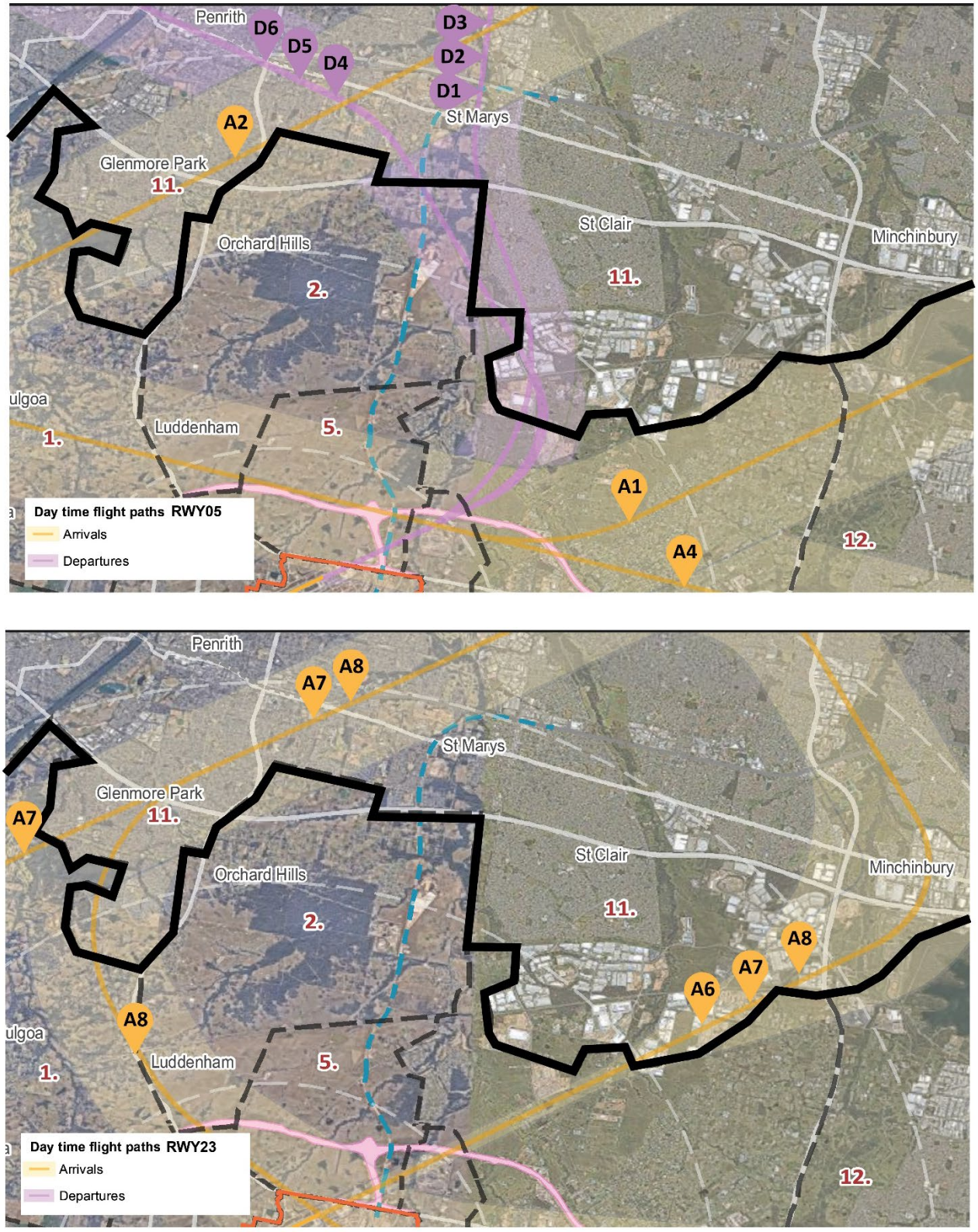


Figure 7.12 Location of LCZ11 South Penrith urban area landscape character zone

7.1.11.1 Existing character (2022)

This landscape is located to the north of WSI, south of Penrith. It is characterised by an undulating topography with mixture of urban uses, such as residential and industrial areas and parkland along South and Ropes Creek. This landscape forms part of the urban area of Penrith, including suburbs such as Glenmore Park and St Marys. Sydney Metro will extend through this landscape, between Orchard Hills and St Marys.

There is air traffic across this zone with flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region as well as flying training areas, with planes arriving or departing from Bankstown and Camden airports at lower altitudes. This may include low altitude emergency services helicopter activity. The South Penrith precinct is also located under the arrival flight path to Bankstown airport. Planes and helicopters would be seen in the airspace over this area, influencing the character of this zone.

7.1.11.2 Landscape impact during operation

Table 7.11 Landscape impact – LCZ11 South Penrith urban area landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Moderate	Urban landscape containing low density residential suburbs, parkland and some industrial areas. This landscape would be heavily used and valued by a dense concentration of residents and recreational users.
2033 scenario		
Sensitivity	Moderate	This area would remain a predominantly low-density suburban area with parkland and some industry. This landscape would continue to be heavily used and valued by a dense concentration of residents and recreational users.
Magnitude of change	Moderate	This zone would be overflown by several flight paths, including: • RWY05 arrivals (A2), with an average of about 8 flights, up to a maximum of about 19 arrival flights, per day with planes at likely to be at a height of between 10,500–8,000 ft (about 3.2–2.4 km) • RWY05 departures (D1-D6), with an average of about 38 flights, up to a maximum of about 92 departure flights, per day with planes likely to be at a height of between 5,000–8,000 ft (1.5–2.4 km) • RWY23 arrivals (A6-A8), with an average of about 48 flights, up to a maximum of about 105 flights, per day with planes likely to be at a height of between 5,000–2,500 ft (1524–760 metres). Overall, due to the number of overflights, the project would result in a noticeable change to the character of this zone.
Impact level	**Moderate**	
2055 scenario		
Sensitivity	Moderate	This area would remain a predominantly low-density suburban area with parkland and some industry. This landscape would continue to be heavily used and valued by a dense concentration of residents and recreational users.
Magnitude of change	Moderate	Planes would continue to follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A2) to about 19 flights on average, up to a maximum of about 45 flights, per day • RWY05 departures (D1-D6) to about 115 flights on average, up to a maximum of about 262 departure flights, per day • RWY23 arrivals (A6-A8) to about 139 flights on average, up to a maximum of about 273 departure flights, per day. While the frequency of planes crossing over this zone would increase, overall, there would continue to be a noticeable change to the character of this zone.
Impact level	**Moderate**	

7.1.12 LCZ12 – Western Sydney Parklands landscape character zone

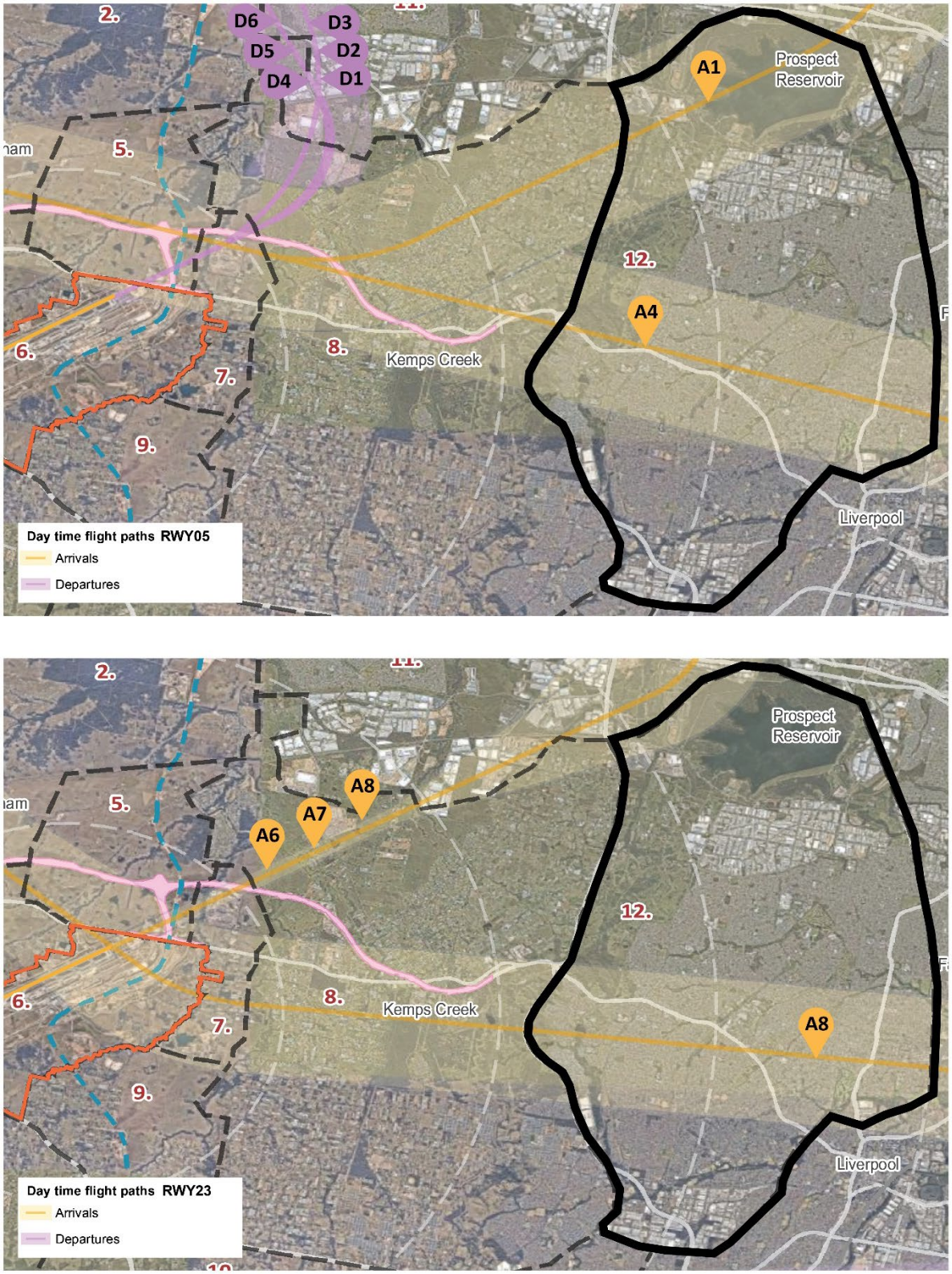


Figure 7.13 Location of LCZ12 Western Sydney Parklands landscape character zone

7.1.12.1 Existing character (2022)

This landscape is located to the east of WSI, forming part of the Western Sydney Parklands, providing a corridor of open space for the growing population in western Sydney. It is characterised by large areas of open space including park and bushland along Eastern Creek, including Prospect Reservoir and adjacent nature reserve.

There is air traffic across this zone with flights from the Sydney (Kingsford Smith), Bankstown and Camden airports as well as flying training areas. Whilst some of these overflights are high there would also be flight training activity at lower altitudes. The Western Sydney parklands are located under several arrival and departure flight paths to and from Bankstown airport. There would be flights seen over this area and have some influence over the character of this zone.

7.1.12.2 Landscape impact during operation

Table 7.12 Landscape impact – LCZ12 Western Sydney Parklands landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Moderate	This zone includes parkland areas used and valued by residents of Western Sydney and places with regionally important scenic value such as Prospect Reservoir. This landscape would be heavily used and valued by a dense concentration of residents and recreational users.
2033 scenario		
Sensitivity	Moderate	This zone would be maintained as predominantly parkland. This landscape would be heavily used and valued by a dense concentration of residents and recreational users with regionally important landscape features.
Magnitude of change	Low	This zone would be overflown by several arrival and departure flight paths, including the following: • RWY05 arrivals (A1 and A4), about 15 flights on average, up to a maximum of about 36 arrival flights, per day with planes likely to be at an altitude of about 13,300 ft (4 km) • RWY23 arrivals (A8), about 8 flights on average, up to a maximum of about 17 flights, per day with planes likely to be at an altitude of about 13,300 ft (4 km). Flight path RWY05 arrivals (A1) would cross directly over Prospect Reservoir. No departure flights would pass over this zone. Overall, due to the frequency of flights, the project would result in a slight change to the character of this zone.
Impact level	**Moderate-Low**	
2055 scenario		
Sensitivity	Moderate	This zone would be maintained as predominantly parkland. This landscape would be heavily used and valued by a dense concentration of residents and recreational users with regionally important landscape features.
Magnitude of change	Moderate	Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1 and A4) to about 40 flights on average, up to a maximum of about 93 flights, per day • RWY23 arrivals (A8) to about 24 flights on average, up to a maximum of about 48 flights, per day. Overall, the project would result in a noticeable change to the character of this zone.
Impact level	**Moderate**	

7.2 Assessment of landscape character zones – The Blue Mountains

The Blue Mountains is located to the west of WSI and includes both natural and urban areas. The landscape of the Blue Mountains that has been considered in this assessment includes parts of the GBMA and adjacent reserves, as well as the towns, villages and bushland areas alongside the Great Western Highway.

While there is a diverse mosaic of landscapes within the landscape and visual study area of the Blue Mountains, 3 broad landscape character zones have been identified for the purposes of this assessment. These are based on similar topography, vegetation type and cover, land use and built form (existing and emerging), including:

- Blue Mountains iconic features landscape character zone (LCZ13)
- Blue Mountains forested hills and valleys landscape character zone (LCZ14)
- Blue Mountains township spine landscape character zone (LCZ15).

The following sections includes a description of the existing conditions and sensitivity of each landscape, as well as the magnitude of change expected because of the project, and assigns an impact level.

7.2.1 LCZ13 – Blue Mountains iconic features landscape character zone

7.2.1.1 Existing conditions

This landscape includes the striking landscape formations that are unique to the GBMA, are of Outstanding Universal Value, and contribute to its world heritage status, including the dramatic system of vertical cliffs, sandstone canyons, pedestals and pagoda rock formations that fringe the plateaus such as the Kanangra Walls, The Three Sisters and the long cliff lines of Narrow Neck and Mount Solitary.

There is currently air traffic passing over this zone, with flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region . Generally, the larger planes are travelling at higher altitudes and some smaller planes and helicopters are seen generally at a lower altitude. These planes are visible but do not strongly influence the character of the zone.

7.2.1.2 Landscape impact during operation

Table 7.13 Landscape impact – LCZ13 Blue Mountains iconic features landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Very high	Contains the distinctive, unique and landscape features for which the Blue Mountains obtained World Heritage Area status, including dramatic landform (vertical cliffs, sandstone canyons, pedestals and pagoda rock formations) and native vegetation. Comprises a high sense of tranquillity and wilderness with minimal evidence of human presence.
2033 scenario		
Sensitivity	Very high	As this zone is within the GBMA, the character and level of sensitivity would remain the same.
Magnitude of change	Low	Some of the landscape features in this zone that would be overflown or in close proximity to the preliminary flight paths include: • Mount Solitary (927 metres above sea level), overflown by RWY23 departures (D11) with about 10 flights on average, up to a maximum of about 19 flights, per day with planes likely to be at an altitude of between 10,500–13,300 ft (about 3.2–4 km) above sea level, about 7,500 ft (2.2 km) above Mount Solitary. • Kings Tableland (about 700 metres above sea level) overflown by: – RWY05 departures (D4-D5) with about 9 flights on average, up to a maximum of about 20 flights, per day with planes at an altitude between 13,300–17,500 ft (4–5.3 km) above sea level, about 10,900–15,400 ft (3.3–4.3 km) above the tableland; and – RWY23 arrivals (A7), with about 24 flights on average, up to about 51 flights per day, with planes at an altitude of about 8,000–10,500 ft (about 2.5–3.2 km), about 5,900 ft (1.8 km) above the tableland. • The Grose Valley and surrounding escarpments (about 920 metres above sea level), would be overflown by RWY05 departures (D2), with about 3 flights on average, up to a maximum of 8 flights, with planes likely to be at an altitude of about 13,300 ft to 17,500 (about 4–5.3 km), and about 10,000–14,500 ft (about 3–4.5 km) above the escarpments. The character of aircraft, and at times contrails, would contrast with the natural forms of clouds in the sky and natural features of the land. Overall, there would be several flight paths over this zone, however, the planes would be relatively high and passing over at a relatively low frequency. This would slightly alter the character of this zone.
Impact level	**High-Moderate**	As there would be a low magnitude of change to a landscape of very high sensitivity.

	Assessment level	Details
2055 scenario		
Sensitivity	Very high	As this zone is within the GBMA, the character and level of sensitivity would remain the same.
Magnitude of change	Low	Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing. For some of the landscape features in this zone, this would include: • Mount Solitary overflown by RWY23 departures (D11), increasing to about 33 flights on average, up to a maximum of about 62 flights, per day • Kings Tableland overflown by RWY05 departures (D4-D5), increasing to about 21 flights on average, up to a maximum of 47 departures, per day and RWY23 arrivals (A7), increasing to about 69 flights on average, up to a maximum of about 136 flights, per day • The Grose Valley and surrounding escarpments overflown by RWY05 departures (D2), about 18 flights on average, up to a maximum of 42 flights, per day. Overall, while there would be an increase in flight frequency, and there would be a slight change to the character of this zone.
Impact level	**High-Moderate**	As there would be a low magnitude of change to a landscape of very high sensitivity.

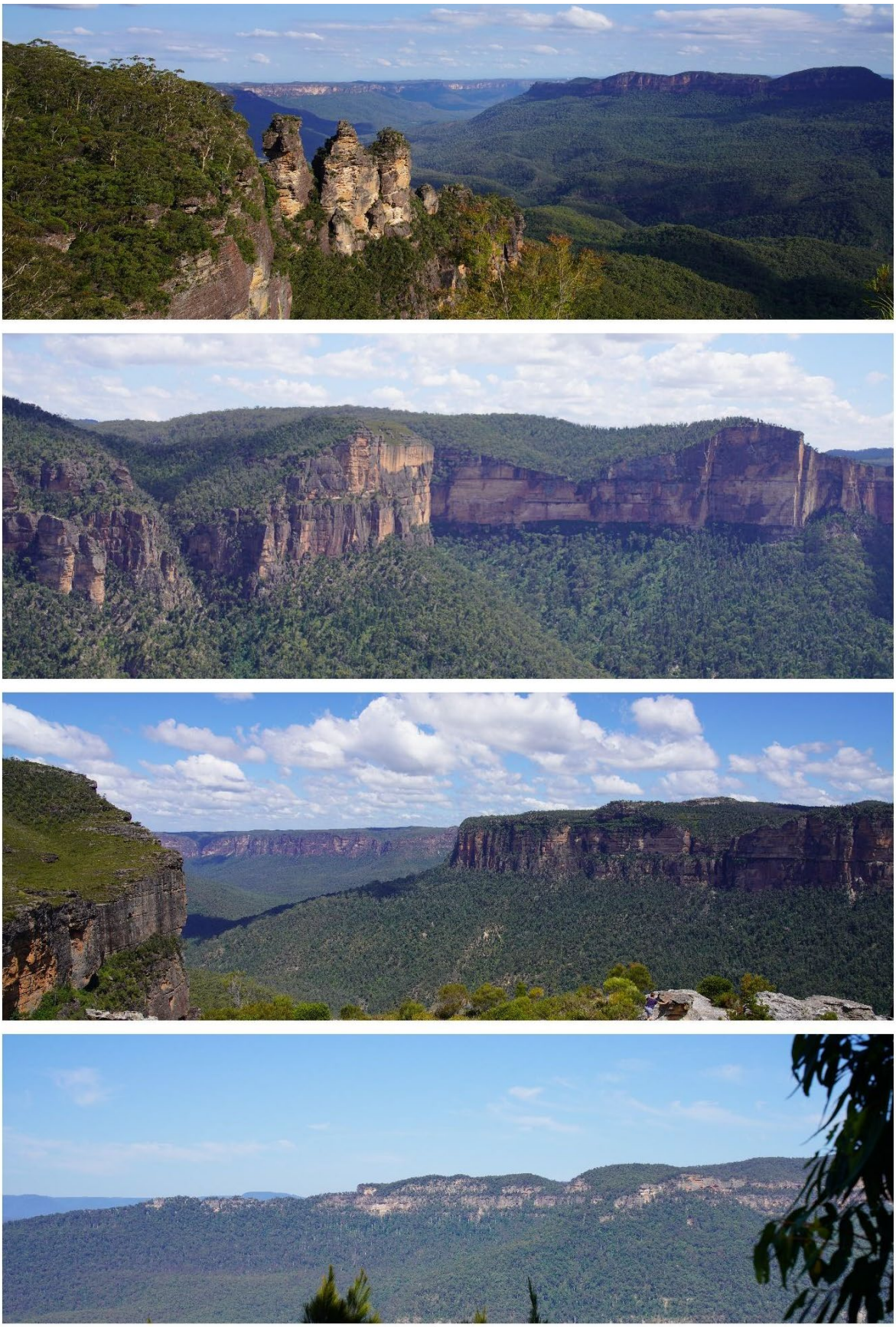


Figure 7.14 LCZ13 Character imagery

7.2.2 LCZ14 – Blue Mountains forested hills and valleys landscape character zone

7.2.2.1 Existing conditions

This landscape includes the undulating forested hills and valleys located between and alongside the striking landscape formations. This area is dominated by eucalyptus species unique to the GBMA, creating a highly natural and scenic landscape. This area also includes adjacent reserves such as the Burragorang and Nattai State Conservation Areas, which contain a similar character of undulating forested hills and valleys. The wide expanse of the forest and minimal built features also creates a strong sense of remoteness and tranquillity.

There is air traffic visible across this zone, with flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports across the region. These overflights are high and do not strongly influence the character of the zone.

7.2.2.2 Landscape impact during operation

Table 7.14 Landscape impact – LCZ14 Blue Mountains forested hills and valleys landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	High	Typically includes undulating areas of native vegetation unique to the Blue Mountains and adjacent reserves such as Kanangra-Boyd National Park, with some unique and landscape features such steep hillsides, valleys, canyons and lakes. Comprises a sense of tranquillity and wilderness with some presence of human presence e.g. small scale built development such as campgrounds, access roads and picnic areas.
2033 scenario		
Sensitivity	High	As this zone generally comprises reserves, including the GBMA, the character and level of sensitivity should remain the same.
Magnitude of change	Low	To the north of the Great Western Highway, this zone would be overflown by 4 departure flight paths, including: • RWY05 departures (D1-D3) at an altitude of between 10,500–17,500 ft, with an average of 23 flights, up to a maximum of 55 flights, per day • RW023 departures (D10) at an altitude of between 10,500–13,300 ft (3.2–4 km) with an average of 18 flights, up to a maximum of 36 flights per day. To the south of the Great Western Highway, this zone would be overflown by several departure and arrival flight paths, including: • RWY05 departures (D4-D6) at an altitude of between 10,500–13,300 ft (3.2–4 km) above sea level with an average of 15 flights, up to a maximum of 37 flights, per day passing over Kanangra-Boyd National Park • RWY23 departures (D10-D12 and D14) at an altitude of between 8,000–10,500 ft (2.4–3.2 km) above sea level with an average of about 46 flights, up to a maximum of 92 flights, per day • RWY23 arrivals (A7) at an altitude of between 8,000–10,500 ft (2.4–3.2 km) above sea level with an average of about 24 flights, up to a maximum of 51 flights, per day.

	Assessment level	Details
		The planes would vary in altitude, with lower altitudes in eastern parts and southern parts of the zone (up to about 2,500 to 8,000 ft or 750 metres to 2.5 km above sea level) including over Burragorang State Conservation Area, Lake Burragorang and the Erskine Range, increasing to higher altitudes in western and northern part of the zone (up to about 8,000 to 17,500 ft or 2.5 to 5 km above sea level) for example over Kanangra-Boyd National Park. The character of aircraft, and at times contrails, would contrast with the natural forms of clouds in the sky and natural features of the land. Overall, there would be multiple flight paths over this zone, however, the planes would be relatively high across the majority of this zone. This would slightly alter the character of this zone.
Impact level	**Moderate**	As there would be a low magnitude of change to a landscape of high sensitivity.
2055 scenario		
Sensitivity	High	As this zone generally comprises reserves, including the GBMA, the character and level of sensitivity should remain the same.
Magnitude of change	Moderate	Planes would follow the same flight paths and at the same altitudes, with the frequency of flights increasing, including the following. To the north of the Great Western Highway: • RWY05 departures (D1-D3) increasing to 69 flights on average, up to a maximum of 158 flights, per day • RWY23 departures (D10) increasing to 52 flights on average, up to a maximum of 97 flights, per day. To the south of the Great Western Highway: • RWY05 departures (D4-D6) increasing to 46 flights on average, up to a maximum of 104 flights, per day • RWY23 departures (D10-D12 and D14) increasing to 139 flights on average, up to a maximum of 263 flights, per day • RWY23 arrivals (A7) increasing to 69 flights on average, up to a maximum of 136 flights, per day. Overall, the project would result in a moderate magnitude change to the character of this zone, due to the increase in frequency.
Impact level	**High-Moderate**	As there would be a moderate magnitude of change to a landscape of high sensitivity.

Figure 7.15 LCZ14 Character imagery

7.2.3 LCZ15 – Blue Mountains township spine landscape character zone

7.2.3.1 Existing conditions

This landscape includes the towns and villages set within the Blue Mountains local government area along the spine of development either side of the Great Western Highway such as Blaxland, Woodford and Katoomba, each containing a unique built form, character and sense of place. These towns and villages accommodate most of the population of the Blue Mountains, and are typically low density, consisting mainly of single and double storey buildings extending along ridgelines and hillsides, with many properties directly fronting or containing views to the surrounding bushland. This zone also includes the land between the towns, outside of the GBMA, alongside the Great Western Highway, consisting of undulating forest.

There is air traffic existing across this zone, with flights from the Sydney (Kingsford Smith) Airport, Bankstown Airport and other airports in the region, which influence the character of the zone, particularly near Katoomba.

7.2.3.2 Landscape impact during operation

Table 7.15 Landscape impact – LCZ15 Blue Mountains township spine landscape character zone

	Assessment level	Details
2022 baseline		
Sensitivity	Moderate	The native bushland area alongside the Great Western Highway and between towns (generally outside of the GBMA) comprise 'scenic value' (cl.6.13, Blue Mountains City Council, 2015) and 'high amenity and landscape value' (Blue Mountains City Council, 2020). The character and amenity of the Blue Mountains urban areas (towns and villages) is also valued locally and regionally (Blue Mountains City Council, 2020).
2033 scenario		
Sensitivity	Moderate	Local planning provisions for the Blue Mountains (Blue Mountains LEP 2015 and Blue Mountains LSPS 2020) aim to retain the character of this zone, and level of sensitivity should therefore remain the same.
Magnitude of change	Low	Overflown by several flight paths, this view would include: • RWY05 departures (D4-D6) crossing over the Great Western Highway between Blaxland and Warrimoo, at a height of between about 8,000–15,000 ft (2.4–3.2 km, with about 15 flights on average, up to a maximum of 37 flights, per day • RWY05 departures (D3) would cross over Medlow Bath, at a height of about 17,500 ft, with about 5 flights on average, up to a maximum of 11 flights, per day • RWY23 departures (D10) crossing over the Great Western Highway east of Linden at a height of about 10,500–13,300 ft (3.2–4 km) with about 18 flights on average, up to a maximum of 36 flights, per day. No arrival flights would pass over this landscape character zone. The character of aircraft, and at times contrails, would contrast with the natural forms of clouds in the sky and natural features of the land. Overall, there would be several flight paths over this zone, however, the planes would be relatively high and pass over at relatively low frequencies. This would slightly alter the character of this zone.
Impact level	**Moderate-Low**	As there would be a low magnitude of change to a landscape of moderate sensitivity.

	Assessment level	Details
2055 scenario		
Sensitivity	Moderate	Local planning provisions for the Blue Mountains (Blue Mountains LEP 2015 and Blue Mountains LSPS 2020) aim to retain the character of this zone, and level of sensitivity should therefore remain the same.
Magnitude of change	Low	Planes would follow the same flight paths and at the same altitudes, with the frequency of flights increasing, including: • RWY05 departures (D4-D6), to 46 flights on average, up to a maximum of 104 flights, per day (near Blaxland) • RWY05 departures (D3), to 9 flights on average, up to a maximum of 19 flights, per day (near Medlow Bath) • RWY23 departures (D10), to 52 flights on average, up to a maximum of 97 flights, per day (near Linden). Overall, the project would result in a noticeable change to the character of this zone.
Impact level	**Moderate-Low**	As there would be a low magnitude of change to a landscape of moderate sensitivity.

7.3 Summary of landscape character impacts

The following table summarises the landscape character impacts of Western Sydney and the Blue Mountains.

Table 7.16 Landscape character zone assessment summary table

Landscape character zone	2022 baseline	2033 scenario			2055 scenario		
	Sensitivity	Sensitivity	Magnitude	Landscape impact	Sensitivity	Magnitude	Landscape impact
Western Sydney							
LCZ1 – Penrith rural south-west landscape character zone	L	L	L	**L**	L	M	**M-L**
LCZ2 –Penrith south-east rural transition landscape character zone	M	M	L	**M-L**	M	M	**M**
LCZ3 –Greendale and Silverdale rural and residential landscape character zone	L	L	M	**M-L**	L	H	**M**
LCZ4 – Luddenham village and agricultural precinct landscape character zone	M	M	M	**M**	M	H	**H-M**
LCZ5 –Northern Gateway precinct landscape character zone	L	VL	M	**L**	VL	M	**L**
LCZ6 – WSI landscape character zone	VL	VL	N	N	VL	N	N
LCZ7 – Badgerys Creek landscape character zone	L	VL	L	N	VL	L	N
LCZ8 – Kemps Creek and Rossmore rural residential landscape character zone	L	L	M	**M-L**	L	M	**M-L**
LCZ9 – Aerotropolis core precinct landscape character zone	L	M	L	**M-L**	M	L	**M-L**
LCZ10 – Leppington rural residential landscape character zone	L	M	N	N	M	N	N
LCZ11 –South Penrith urban area landscape character zone	M	M	M	**M**	M	M	**M**
LCZ12 – Western Sydney Parklands landscape character zone	M	M	L	**M-L**	M	M	**M**
The Blue Mountains							
LCZ13 – Blue Mountains Iconic features landscape character zone	VH	VH	L	**H-M**	VH	L	**H**-M
LCZ14 – Blue Mountains forested hills and valleys landscape character zone	H	H	L	**M**	H	M	**H-M**
LCZ15 – Blue Mountains township spine landscape character zone	M	M	L	**M-L**	M	L	**M-L**

Key: N = Negligible, VL = Very Low, L = Low, M-L = Moderate-Low, M = Moderate, H-M = High-Moderate, H = High, VH = Very High

Chapter 8 Visual impact assessment

8.1 Assessment of daytime visual impacts

8.1.1 Assessment of representative viewpoints – Western Sydney

A site visit was undertaken during October 2022. The following viewpoints were selected as representative of the range of views to the project.

This includes views from publicly accessible locations within Western Sydney (typically existing road corridors, future urban centres and lookouts) which have been identified as having increased visual sensitivity or where people are likely to congregate.

The following section includes an assessment of each representative view and identifies the daytime visual impacts.

The views assessed are:

- Viewpoint 1 – View from Orchard Hills
- Viewpoint 2 – View from George Maunder Lookout, Prospect Reservoir
- Viewpoint 3 – View from Walworth Road, Horsley Park
- Viewpoint 4 – View from Mamre Road, Kemps Creek
- Viewpoint 5 – View from Luddenham Village
- Viewpoint 6 – View from Orangeville
- Viewpoint 7 – View from Silverdale
- Viewpoint 8 – View from Warragamba Dam Lookout.

The location of views that have been assessed in this technical paper are shown in Figure 8.1 and Figure 8.2.

An assessment of each view is contained in the following section.

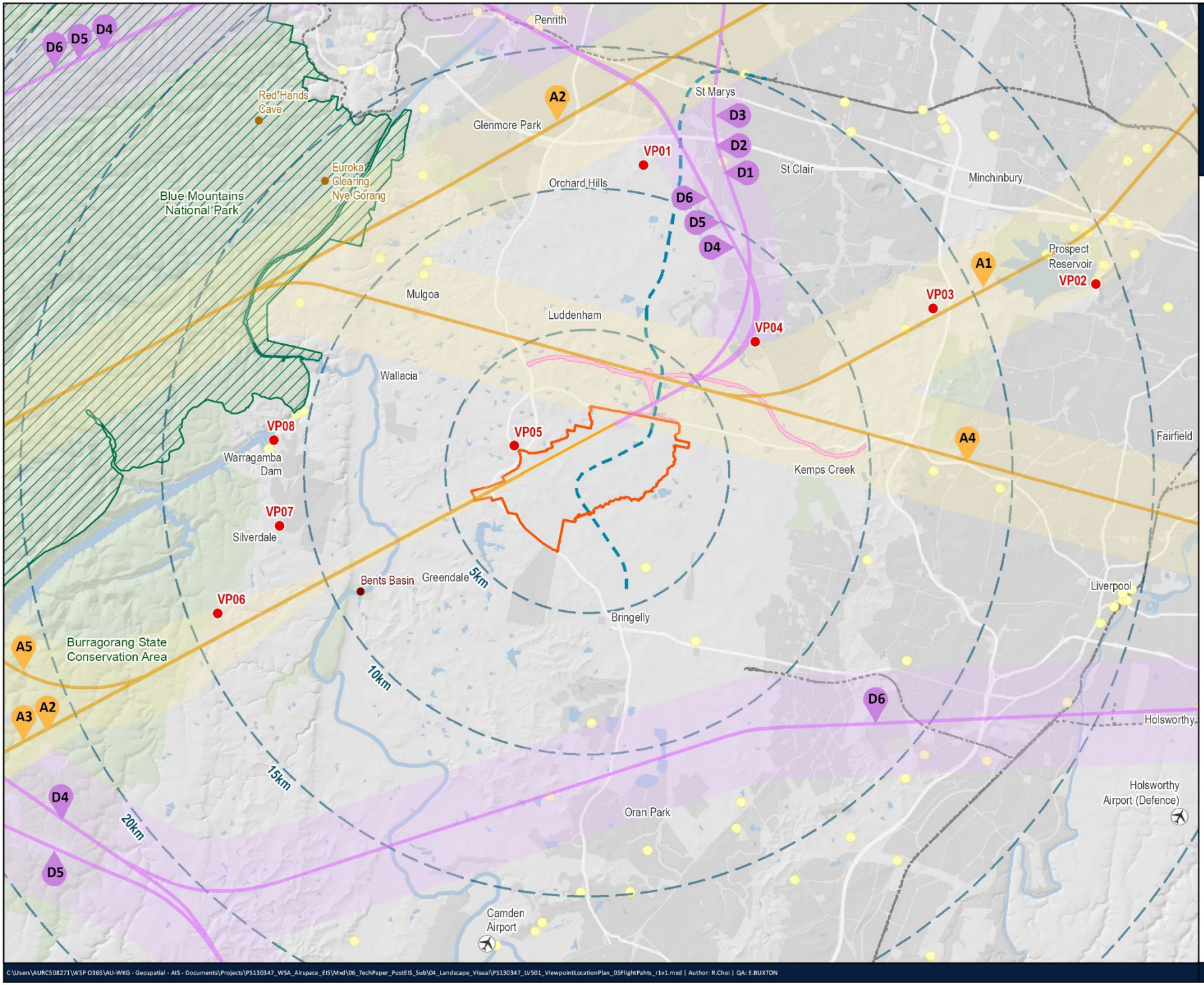


Figure 8.1

Viewpoint location plan with 05 Runway flight paths - Western Sydney

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Viewpoint locations
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Day time flight paths and swathes

- Arrivals
- Departures

VP01 - Homestead Rd, Orchard Hills
VP02 - George Maunder Lookout, Prospect Reservoir
VP03 - Walworth Road, Horsley Park
VP04 - Mamre Road, Kemps Creek
VP05 - St James Anglican Church, Luddenham Village
VP06 - Silverdale Road, Orangeville
VP07 - Kalangara Road Silverdale
VP08 - Warragamba Dam Lookout

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:175,000 Date: 2/08/2023

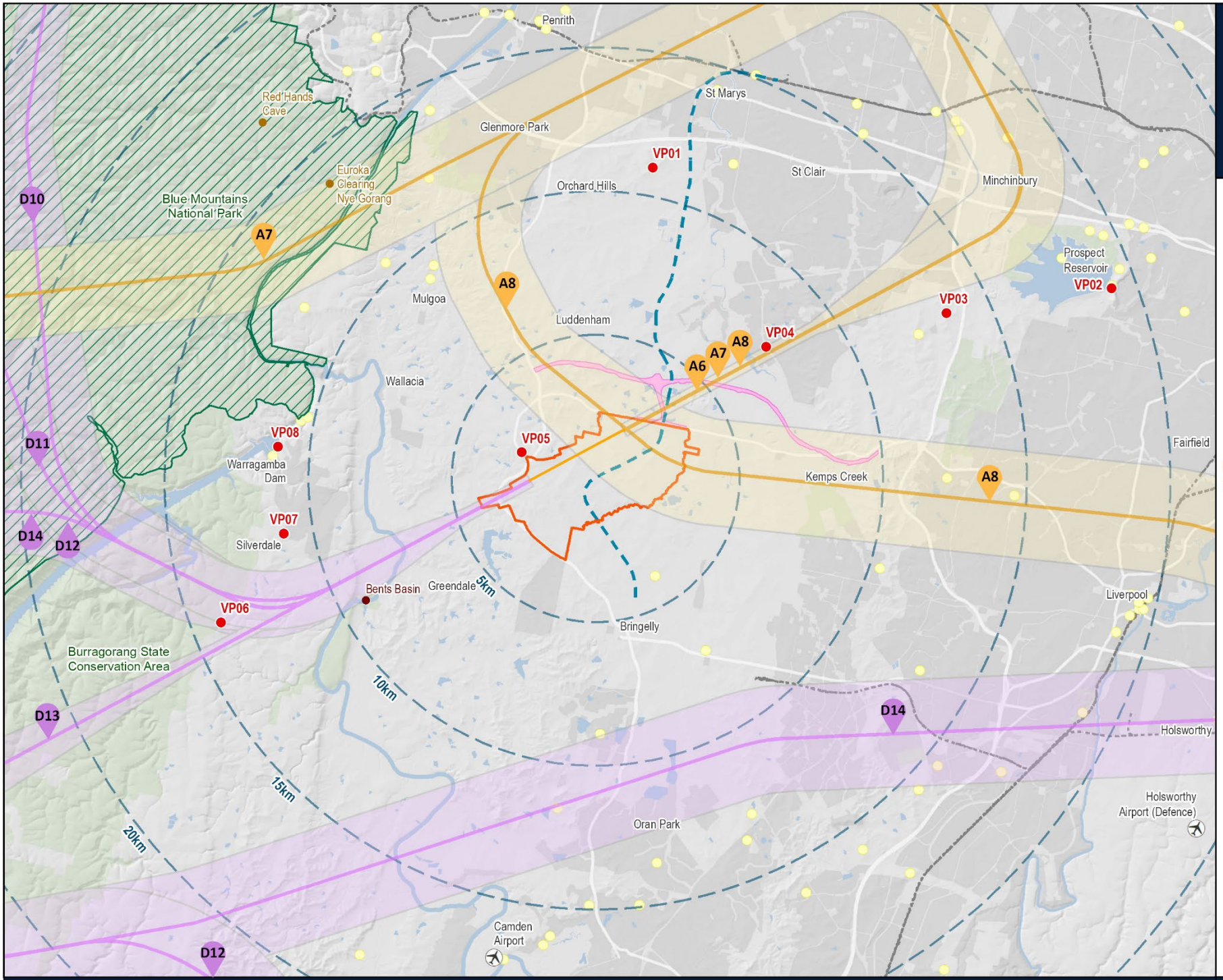


Figure 8.2

Viewpoint location plan with 23 Runway flight paths - Western Sydney

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Viewpoint locations
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Day time flight paths and swathes

- Arrivals
- Departures

VP01 - Homestead Rd, Orchard Hills
VP02 - George Maunder Lookout, Prospect Reservoir
VP03 - Walworth Road, Horsley Park
VP04 - Mamre Road, Kemps Creek
VP05 - St James Anglican Church, Luddenham Village
VP06 - Silverdale Road, Orangeville
VP07 - Kalangara Road Silverdale
VP08 - Warragamba Dam Lookout

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:175,000 Date: 2/08/2023

8.1.1.1 Viewpoint 1: View from Orchard Hills

Figure 8.3 View south east from Homestead Road, Orchard Hills

The following table includes a summary of the assessment of visual impact.

Table 8.1 Viewpoint 1: View assessment table

Viewpoint 1	View from Orchard Hills
2022 baseline	
Existing view	Figure 8.3 shows an elevated view from Homestead Road across a varied landscape, containing areas of small lot farms and suburban development in Orchard Hills, low-lying rural areas along Blaxland and South creeks, and industrial development at Erskine Park. Western Sydney Parklands is visible in the background of view, including extensive areas of parkland and the Eastern Creek Motorsport Park. The vegetated ridgeline of the Prospect Reservoir and vegetation within the parkland is a scenic landscape feature, providing a backdrop to the view. The future intention for this area is for it be developed into urban areas with associated infrastructure (refer Section 4.2.4). This would include increased urban density across the valley.
Visual sensitivity	Low This view would be experienced by concentrations of residents and is of local scenic value.

Viewpoint 1	View from Orchard Hills
2033 scenario	
Visual sensitivity	Low While this view may transform to include more dense urban development, this view would continue to be experienced by concentrations of residents and is of local scenic value.
Magnitude of change	Moderate This view would include: • RWY05 arrivals (A1) at a distance of about 8 km and at an altitude of about 13,300 ft (about 4 km), with an average of 8 flights, up to a maximum of 19 flights, per day • RWY05 departures (D1-D6) at a distance of up to about 1 km and at an altitude of between 2,500 ft (about 760 metres) and 5,000 ft (about 1.5 km), with an average of 38 flights, up to a maximum of 92 flights, per day • RWY23 arrivals (A6-A8) at a distance of about 7 km, at an altitude of about 2,500 ft (about 750 metres), with an average of 48 flights, up to a maximum of 105 flights per day. This view is oriented towards 2 arrival and 2 departure flight paths. There would be some planes visible travelling across the view at lower elevations. There would also be planes visible in the background of the view. Due to the proximity of this view to the runway, there would be a greater concentration of flights around the runway and then dispersing across the surrounding sky. This air traffic would be viewed above the valley within a predominantly open sky. Overall, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate-Low**
2055 scenario	
Visual sensitivity	Low While this view may transform to include more dense urban development, this view would continue to be experienced by concentrations of residents and is of local scenic value.
Magnitude of change	Moderate Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1), to about 19 flights on average, up to a maximum of about 45 flights, per day • RWY05 departures (D1-D6), to about 115 flights on average, up to a maximum of about 262 flights, per day • RWY23 arrivals (A6-A8), to about 139 flights on average, up to a maximum of about 273 flights, per day. The frequency of approaching and departing flights at lower elevations, in the fore and middle ground of the view, would increase. While the distance reduces the magnitude of change somewhat, the increased frequency would increase the duration when planes would be visible throughout the day. These flights would be seen in a predominantly open sky increasing their prominence in the view. Overall, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate-Low**

8.1.1.2 Viewpoint 2: View from George Maunder Lookout, Prospect Reservoir

Figure 8.4 View west from George Maunder Lookout, Prospect Reservoir

The following table includes a summary of the assessment of visual impact. Refer to Appendix A for photomontages.

Table 8.2 Viewpoint 2: View assessment table

Viewpoint 2	View from George Maunder Lookout, Prospect Reservoir
2022 baseline	
Visual description	Figure 8.4 shows an elevated view from George Maunder Lookout, at the eastern side of Prospect Reservoir. The reservoir and surrounding parkland is on the State Heritage Register (SHR), comprising aesthetic and recreational values. The lookout provides an expansive view across the reservoir, including the water body and surrounding bushland, both listed as aesthetic landscape features in the SHR listing (NSW SHI, 2001). The vegetated hills in the GBMA are a scenic landscape feature, providing a backdrop to the view.
Visual sensitivity	Moderate This view is a view from a regionally important recreational area and includes a regionally important area of open space in the view.

Viewpoint 2	View from George Maunder Lookout, Prospect Reservoir
2033 scenario	
Visual sensitivity	Moderate This view is from a view from a regionally important recreational area and will continue to include a regionally important area of open space in the view.
Magnitude of change	Moderate This view would include: • planes overhead on RWY05 arrivals (A1) descending from an altitude of about 17,500 to 13,300 ft (about 5–4 km), with an average of 8 flights, up to a maximum of 19 flights, per day • RWY05 departures (D1-D6) at a distance of about 11 km and an altitude of about 2,500 ft (about 760 metres), with up to 38 flights on average, up to a maximum of 92 flights, per day. There may be some non-jet flights closer to this view • RWY23 arrivals (A6-A8) at a distance of about 3 km, at an altitude of about 2,500 ft (about 750 metres), with up to 48 flights on average up to a maximum of 105 flights, per day. Due to the proximity of this view to the runway, there would be a greater number of planes seen across this view. This would include a large number of arriving flights which may be visible overhead or passing across the middle ground (about 5 km away) and relatively low in the sky. These planes together with planes visible in the background, would be viewed within an open and expansive skyline, against the distant backdrop of the Blue Mountains. This view also contains natural and aesthetic features of heritage significance. Overall, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate**
2055 scenario	
Visual sensitivity	Moderate This view is from a view from a regionally important recreational area and will continue to include a regionally important area of open space in the view.
Magnitude of change	Moderate Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1), to 19 flights on average up to a maximum of 45 arrival flights per day • RWY05 departures (D1-D6), to 115 flights on average up to a maximum of 262 departing flights per day • RWY23 arrivals (A6-A8), to 139 flights on average up to a maximum of 273 arrival flights per day. The frequency of approaching and departing flights in the foreground, mid ground and background would considerably increase the duration of time when planes would be visible throughout the day. Overall, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate**

8.1.1.3 Viewpoint 3: View from Walworth Road, Horsley Park

Figure 8.5 View south west from Walworth Road, Horsley Park

The following table includes a summary of the assessment of visual impact.

Table 8.3 Viewpoint 3: View south west from Walworth Road, Horsley Park

Viewpoint 3	View south west from Walworth Road, Horsley Park
2022 baseline	
Visual description	Figure 8.5 shows an elevated view across rural areas of Horsley Park from Walworth Road, including small lot farms with scattered dwellings and rural structures such as sheds and crop protection structures. Several steel transmission line structures are visible, traversing this rural area between nearby West Wetherill Park and Sydney West substations. The partly vegetated ridgeline in the middle ground of view conceals views to low lying industrial areas of Kemps Creek and construction of WSI and beyond. The vegetated hills in the GBMA are a scenic landscape feature, in this context being of regional importance, providing a backdrop to the view.
Visual sensitivity	Low This is a view experienced by a concentration of residents and includes some areas of local and regional scenic value.

Viewpoint 3	View south west from Walworth Road, Horsley Park
2033 scenario	
Visual sensitivity	Low There would be increasing residential development seen in this view as the landscape transitions as part of the South West Growth Area. This would continue to be experienced by a concentration of residents and include some areas of local and regional scenic value.
Magnitude of change	Moderate This view would include: • planes overhead on RWY05 arrivals (A1) descending from an altitude of about 13,300 ft (about 4 km), with 8 flights on average, up to a maximum of 19 flights, per day. This flight path will converge with another flight path (A4) approximately 4 km to the south at an altitude of about 13,300 ft (about 4 km) with 7 flights on average, up to a maximum of 17 flights, per day • RWY05 departures (D1-D6) at a distance of up to about 5 km and at an altitude of between 2,500 ft (about 760 metres) and 5,000 ft (about 1.5 km), with an average of 38 flights, up to a maximum of 92 flights, per day • RWY23 arrivals (A6-A8) at a distance of about 2 km, at an altitude about 10,500 ft (about 3.2 km), with 48 flights on average, up to a maximum of 105 flights, per day. This view would include some arrival flights high overhead and crossing the view. There would also be arriving planes visible in the background of the view. The air traffic would be viewed in a predominantly open sky, however future urban development and infrastructure may enclose the open sky somewhat. Overall, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate-Low**
2055 scenario	
Visual sensitivity	Low There would be increasing residential development seen in this view as the landscape transitions as part of the South West Growth Area. This view would continue to be experienced by a concentration of residents and include some areas of local and regional scenic value.
Magnitude of change	Moderate Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1) increasing to 19 flights on average, up to a maximum of 45 flights, per day; with RWY05 arrivals (A4) increasing to 21 flights on average up to a maximum of 48 flights, per day • RWY05 departures (D1-D6), to about 115 flights on average, up to a maximum of about 262 flights, per day • RWY23 arrivals (A6-A8) increasing to 139 flights on average, up to a maximum of 273 flights, per day. While the frequency of flights has increased for both runways, the magnitude of change would continue to be moderate.
Visual impact	**Moderate-Low**

8.1.1.4 Viewpoint 4: View from residential areas in Kemps Creek

Figure 8.6 View south west from Mamre Road, Kemps Creek

The following table includes a summary of the assessment of visual impact.

Table 8.4 Viewpoint 4: Views from residential areas in Kemps Creek

Viewpoint 4	View south west from Mamre Road, Kemps Creek
2022 baseline	
Visual description	Figure 8.6 show**s** views across rural areas in Kemps Creek and Mount Vernon, including small lot farms with scattered rural dwellings and sheds. Several steel transmission line structures are visible, traversing this rural area between nearby substations. The vegetated valleys of Kemps and South creeks in the middle ground of view conceal the areas under construction at WSI. The vegetated hills in the GBMA are a scenic landscape feature, providing a backdrop to the view.
Visual sensitivity	Low This view is experienced by some residents and passing traffic and includes some glimpses to areas of local and regional scenic value.

Viewpoint 4	View south west from Mamre Road, Kemps Creek
2033 scenario	
Visual sensitivity	Low This area would transition to more dense residential development over time as a part of the South Western Growth area. This view would be experienced by a concentration of residents and includes some glimpses to areas of local and regional scenic value.
Magnitude of change	High This view would include: • planes overhead on RWY05 arrivals at the junction of 2 flight paths (A1 and A4) at an altitude of up to 13,300 ft (about 4 km), with 15 flights on average, up to a maximum of 36 flights, per day • planes overhead on RWY05 departures (D1-D6) at an altitude of about 750–2,500 ft (230–762 metres), with 38 flights on average, up to a maximum of 92 flights, per day • planes overhead on RWY23 arrivals (A6-A8), at an altitude of about 2,500 ft (762 metres), with 48 flights on average, up to a maximum of 105 flights, per day. This view is located at close range, with some flights at low altitude. These flights would be prominent in the view. There would also be some flights that would be visible in the background as they depart from or arrive at the WSI. Overall, the project would result in a considerable change to the amenity of this view and a high magnitude of change.
Visual impact	**Moderate**
2055 scenario	
Visual sensitivity	Low This area would transition to more dense residential development over time as a part of the South Western Growth area. This view would be experienced by a concentration of residents and includes some glimpses to areas of local and regional scenic value.
Magnitude of change	Very high Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1 and A4), to 40 flights on average, up to a maximum of 93 flights, per day • RWY05 departures (D1-D6), to 115 flights on average, up to a maximum of 262 flights, per day • RWY23 arrivals (A6-A8), to 139 flights on average, up to a maximum of 273 flights, per day. The frequency of approaching and departing flights at lower elevations, in the foreground of the view, would considerably increase. These flights would be seen in a partly open sky increasing their prominence in the view. Overall, the planes would be dominant in this view, resulting in a substantial change to the amenity of this view and a very high magnitude of change.
Visual impact	**High-Moderate**

8.1.1.5 Viewpoint 5: View from Luddenham Village

Figure 8.7 View south from St James Anglican Church, Luddenham Village

Refer also to Appendix A – Photomontages, A3 plates.

The following table includes a summary of the assessment of visual impact.

Table 8.5 Viewpoint 5: View from St James Anglican Church, Luddenham Village

Viewpoint 5	View from St James Anglican Church, Luddenham Village
2022 baseline	
Visual description	Figure 8.7 shows a view from the southern edge of Luddenham Village, beside St James Anglican Church. The dual carriageway of the Northern Road is seen in the middle ground of view, separating the undulating rural area surrounding Luddenham from the WSI development, seen in the background of view. The vegetated valley of Badgerys Creek is a scenic landscape feature, providing a backdrop to the view.
Visual sensitivity	Moderate This is a view from the village centre and heritage place, with attractive scenic qualities. This view would be experienced by a dense concentration of residents and includes some glimpses to areas of local scenic value.

Viewpoint 5	View from St James Anglican Church, Luddenham Village
2033 scenario	
Visual sensitivity	Moderate This view would continue to be experienced by a dense concentration of residents and includes some glimpses to areas of local scenic value.
Magnitude of change	Moderate This view would include: • RWY05 arrivals (A1-A5) at a distance of about 1 km and an altitude of 750 ft (230 metres) and lower, with an average of 36 flights, up to a maximum of 87 flights per day • RWY23 departures (D10-D14) at a distance of about 1 km rising sharply from take-off to an altitude of about 750 ft (230 metres), with 47 flights on average, up to a maximum of 95 flights, per day. This view is located in close proximity to the Airport Site and will view flights arriving and departing from WSI to the south and southwest. Two to 3 additional flight paths for departing flights would be seen at varying altitudes in mid to background views in the southwest. These flights would be seen in an open and expansive sky increasing their prominence in the view. Overall, due to the close proximity and frequency of flights at low altitudes, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate**
2055 scenario	
Visual sensitivity	Moderate This view would continue to be experienced by a dense concentration of residents and includes some glimpses to areas of local scenic value.
Magnitude of change	High Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1-A5), to 121 flights on average, up to a maximum of 274 flights, per day • departing RWY23 (D10-D14), to 141 flights on average, up to a maximum of 267 flights, per day. The frequency of approaching and departing flights at lower elevations in the foreground and middle ground of the view would increase, with more planes using the RWY23 and seen in foreground views over the rural outskirts of Luddenham. These flights would be seen in an open and expansive sky increasing their prominence in the view. Overall, there would be a considerable change in the amenity of this view and a high magnitude of change.
Visual impact	**High-Moderate**

8.1.1.6 Viewpoint 6: View from Silverdale Road, Orangeville

Figure 8.8 View south east from Silverdale Road, Orangeville

The following table includes a summary of the assessment of visual impact.

Table 8.6 Viewpoint 6: Views from Silverdale Road, Orangeville

Viewpoint 6	View from Silverdale Road, Orangeville
2022 baseline	
Visual description	Figure 8.8 shows elevated views across rural lands from Silverdale Road. The land is undulating with dense vegetation through the gully near Bushrangers Creek and the background of view includes the low-lying rural areas along the Nepean River valley. The undulating terrain and mature vegetation along the Bushrangers Creek is a landscape feature in this view, with some local scenic value.
Visual sensitivity	Low This is a view shows an undulating rural landscape and would be experienced by a small number of residents and includes some glimpses to areas of local scenic value such as Bushrangers Creek.

Viewpoint 6	View from Silverdale Road, Orangeville
2033 scenario	
Visual sensitivity	Low This view would be experienced by a small number of residents and includes landscape areas of local scenic value.
Magnitude of change	Moderate This view would include: • RWY05 arrivals (A1-A5) would be seen at a distance of about 300 metres and at an altitude of about 2,500 ft (750 metres), with 36 flights on average, up to a maximum of 87 arrivals, per day • planes overhead on RWY23 departures (D10-D14) at an altitude of about 2,500 ft (750 metres), with 47 flights on average, up to a maximum of 95 flights, per day. From this location flights arriving and departing from WSI would be seen. Two flight paths for departing flights may be seen overhead or passing across the middle ground at lower altitudes in an open and expansive sky, increasing their prominence in the view. Overall, due to the close proximity and frequency of flights at low altitudes, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate-Low**
2055 scenario	
Visual sensitivity	Low This view would continue to be experienced by a small number of residents and includes landscape areas of local scenic value.
Magnitude of change	High Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1-A5), to 121 flights on average, up to a maximum of 274 flights, per day • RWY23 departures (D10-D14), to 141 flights on average, up to a maximum of 267 flights, per day. The frequency of approaching and departing flights at lower elevations in the foreground and middle ground of the view would increase. These flights would be seen in an open and expansive sky increasing their prominence in the view. Overall, due to the close proximity and increased frequency of flights at low altitudes, there would be a considerable change to the amenity of this view and a high magnitude of change.
Visual impact	**Moderate**

8.1.1.7 Viewpoint 7: View from Kalangara Road, Silverdale

Figure 8.9 View east from Kalangara Road, Silverdale

Refer also to Appendix A – Photomontages, A3 plates.

The following table includes a summary of the assessment of visual impact.

Table 8.7 Viewpoint 7: Views from Kalangara Road, Silverdale

Viewpoint 7	View from Silverdale
2022 baseline	
Visual description	Figure 8.9 shows an elevated view from the top of Kalangara Road. The foreground view includes an area of low density residential in Silverdale, containing single and double storey dwellings. The middle and background of view includes low-lying rural areas along the Nepean River valley. The mature vegetation along the Nepean River is a landscape feature in this view, with local scenic value.
Visual sensitivity	Low This view would be experienced by a concentration of residents and includes landscape areas of local scenic value.

Viewpoint 7	View from Silverdale
2033 scenario	
Visual sensitivity	Low This view would continue be experienced by a concentration of residents and includes landscape areas of local scenic value.
Magnitude of change	Moderate This view would include: • RWY05 arrivals (A1-A5) at a distance of about 2 km and at an altitude of about 2,500 ft (about 750 metres), to about 36 flights on average, up to a maximum of 87 flights, per day • RWY23 departures (D10-D14) at a distance of about 1.5 km and at an altitude of 2,500 ft (about 750 metres), to about 47 flights on average, up to a maximum of 95 flights, per day. This view is oriented towards the WSI and overlooks several arrival flight paths approaching both the RWY05 and RWY23 operations. The closest flights would be seen approaching and departing the runway from the southwest, viewed with planes at lower altitudes and within 2 km. There would also be flights visible in the background, approaching and departing from the northeast. This elevated position and orientation of view increases the potential for multiple aircraft being visible during peak periods and seen within a predominantly open sky. Overall, due to the frequency and proximity of the planes in this view, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate-Low**
2055 scenario	
Visual sensitivity	Low This view would continue be experienced by a concentration of residents and includes landscape areas of local scenic value.
Magnitude of change	Moderate Planes would follow the same flight paths at the same altitudes, with the frequency of flights increasing, including: • RWY05 arrivals (A1-A5), to about 121 flights on average, to a maximum of 274 flights, per day • RWY23 departures (D10-D14), to about 141 flights on average, up to a maximum of 267 flights, per day. The frequency of departing flights at low elevations in the foreground and middle ground of the view would increase, particularly flights departing via the RWY23 and approaching RWY05 and flying at lower altitudes. The increased frequency of flights again increases the potential for multiple aircraft to be visible in the predominantly open sky, even in non-peak times. Notwithstanding the above, overall, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate-Low**

8.1.1.8 Viewpoint 8: View from Warragamba Dam lookout

Figure 8.10 View south west from Warragamba Dam lookout

The following table includes a summary of the assessment of visual impact.

Table 8.8 Viewpoint 8: View from Warragamba Dam lookout

Viewpoint 8	View from Warragamba Dam lookout
2022 baseline	
Visual description	Figure 8.10 shows an elevated view from Warragamba Dam Lookout, at the eastern end of the dam. The lookout shows the water body, the dam wall and spillway, surrounded by dense bushland. The vegetation to the west of the dam forms part of the GBMA and is a scenic landscape feature in the background of view.
Visual sensitivity	Moderate This view would be experienced by a concentration of recreation al users and includes landscape areas of regional scenic value.

Viewpoint 8	View from Warragamba Dam lookout
2033 scenario	
Visual sensitivity	Moderate This view would continue be experienced by a concentration of recreational users and includes landscape areas of regional scenic value.
Magnitude of change	Low This view would include: • RWY05 arrivals (A1-A2, A4-A5)) may be seen at a distance of about 11 km and at an elevation of about 5,000 ft – 2,500 ft (about 1.5 km – 760 metres), which is about 3,200 ft (about 960 metres) above the hills in the background of the view (beyond the dam). There would be about 23 flights on average, up to a maximum of 55 flights, per day • RWY05 departures (D4, D6) at a distance of about 5.5 km and at a height of 17,500 ft (about 5.3 km) with 15 flights on average, up to a maximum of 37 flights, per day • RWY23 departures (D10-D12 and D14) may be seen at a distance of about 4 km and at a height of about 5,000–8,000 ft (about 1520–2400 metres) above sea level, and about 3,800 ft (1.15 km) above the hills in the middle ground of view (beyond the dam) with 46 flights on average, up to a maximum of 92 flights, per day. The 4 flight paths (D10-D12 and D14) branch out over the downstream waters of the dam and will be seen in the background of the view, about 6 km away. While these flights would be seen in an open and expansive sky, increasing their prominence in the view, the high altitude and the distance will reduce the magnitude of change so that they would not noticeably reduce the amenity of this view. Overall, the project would result in a slight change to the amenity of this view and a low magnitude of change.
Visual impact	**Moderate-Low**
2055 scenario	
Visual sensitivity	Moderate This view would continue to be experienced by a concentration of recreational users and includes landscape areas of regional scenic value.
Magnitude of change	Moderate This view would include: • RWY05 arrivals (A5) increasing to 59 flights on average, up to a maximum of 138 flights, per day • RWY05 departures (D4, D6) increasing to 46 flights on average, up to a maximum of 104 flights, per day • RWY23 departures (D10-D12 and D14) increasing to 139 flights on average, up to a maximum of 263 flights, per day. The frequency of flights in the background would continue to increase, so that planes would be seen more often, visible in the open sky. Overall, however, due to the distance and small scale of planes seen at this distance, there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual impact	**Moderate**

8.1.1.9 Summary of visual impacts – Western Sydney

The following table summarises the visual impacts on the representative viewpoints in Western Sydney.

Table 8.9 Visual impact assessment summary table

Viewpoint (VP)	2022 baseline	2033 scenario			2055 scenario		
	Sensitivity	Sensitivity	Magnitude	Visual impact	Sensitivity	Magnitude	Visual impact
VP1 – View from Orchard Hills	L	L	M	**M-L**	L	M	**M-L**
VP2 – View from George Maunder Lookout, Prospect Reservoir	M	M	M	**M**	M	M	**M**
VP3 – View from Walworth Road, Horsley Park	L	L	M	**M-L**	L	M	**M-L**
VP4 – View from Kemps Creek	L	L	H	**M**	L	VH	**H-M**
VP5 – View from Luddenham Village	M	M	M	**M**	M	H	**H-M**
VP6 – View from Silverdale Road, Orangeville	L	L	M	**M-L**	L	H	**M**
VP7 – View from Kalangara Road, Silverdale	L	L	M	**M-L**	L	M	**M-L**
VP8 – View from Warragamba Dam Lookout	M	M	L	**M-L**	M	M	**M**

Key: N = Negligible, VL = Very Low, L = Low, M-L = Moderate-Low, M = Moderate, H-M = High-Moderate, H = High, VH = Very High

8.1.2 Assessment of representative viewpoints – The Blue Mountains

The Blue Mountains region is a popular destination, including by road, with many sections of the Great Western Highway and the Bells Line of Road offering highly scenic views to the GBMA) as well as opportunities for stopping to appreciate the view from lookouts or other vantage points. Within the wilderness areas there are scattered day-use facilities and campgrounds. The following assessment will assess the visual impacts on these location types in turn.

The location of the features which contribute to landscape character of the Blue Mountains are shown in Figure 8.11 and Figure 8.12. This includes the location of scenic routes, campgrounds, some waterfalls and lookouts.

8.1.2.1 Lookouts

The following section provides an assessment of the potential visual impact on views from scenic lookouts during daytime hours on a representative selection of scenic lookouts within the Blue Mountains. These representative viewpoints are:

- Viewpoint 9 – View from the Burragorang Lookout, The Bluff
- Viewpoint 10 – View from The Rock Lookout (north and south views)
- Viewpoint 11 – View from Portal Lookout
- Viewpoint 12 – View from Hawkesbury Lookout
- Viewpoint 13 – View from Wynnes Rocks Lookout
- Viewpoint 14 – View from Walls Lookout
- Viewpoint 15 – View from Echo Point
- Viewpoint 16 – View from Cleary Memorial Lookout, Kedumba Pass.

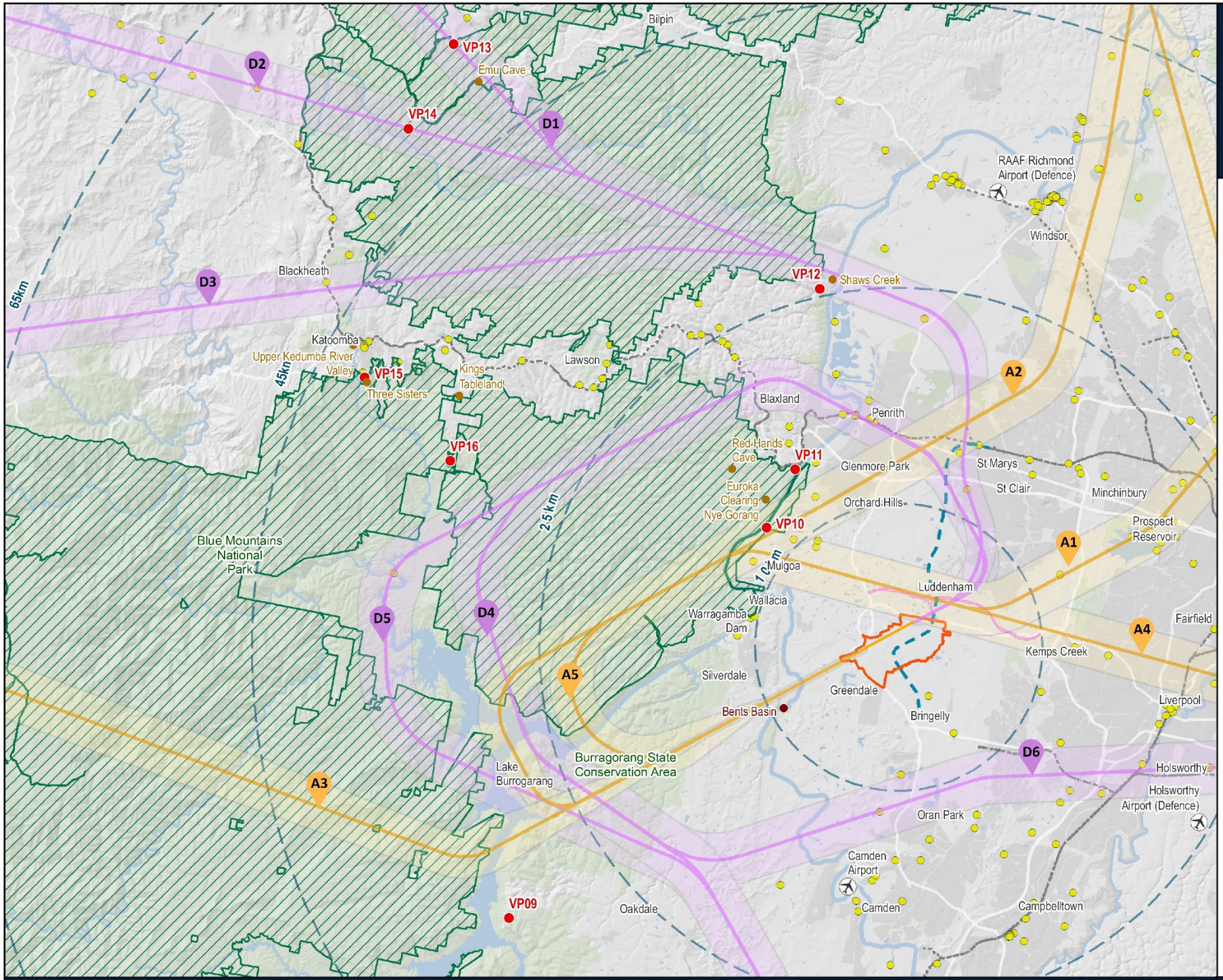


Figure 8.11

Viewpoint location plan with 05 Runway flight paths - Blue Mountains

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Viewpoint locations
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal

Day time flight paths and swathes

- *Arrivals*
- Departures

VP09 - Burragorang Lookout, The Bluff
VP10 - The Rock lookout
VP11 - Portal lookout
VP12 - Hawkesbury Lookout
VP13 - Wynnes Rocks Lookout
VP14 - Walls Lookout
VP15 - Echo Point Lookout
VP16 - Cleary memorial lookout, Kedumba Pass

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 2/08/2023

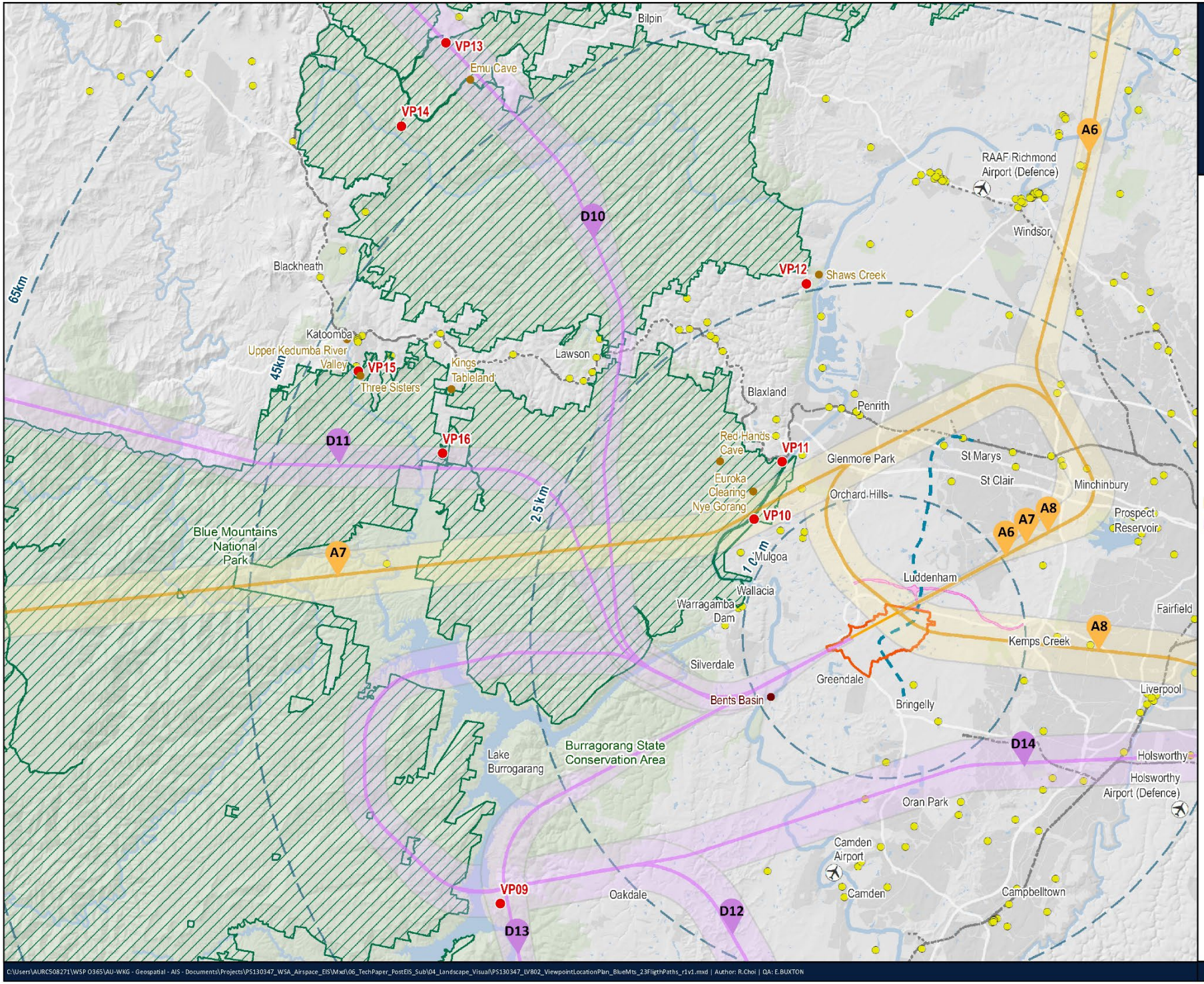


Figure 8.12

Viewpoint location plan with 23 Runway flight paths - Blue Mountains

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Viewpoint locations
- State Heritage Register location
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Day time flight paths and swathes

- *Arrivals*
- Departures

VP09 - Burragorang Lookout, The Bluff
VP10 - The Rock lookout
VP11 - Portal lookout
VP12 - Hawkesbury Lookout
VP13 - Wynnes Rocks Lookout
VP14 - Walls Lookout
VP15 - Echo Point Lookout
VP16 - Cleary memorial lookout, Kedumba Pass

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 2/08/2023

Viewpoint 9: View from Burragorang Lookout, The Bluff

Table 8.10 Viewpoint 9: View from the Burragorang Lookout, The Bluff

Viewpoint 9	View from the Burragorang Lookout, The Bluff
2022 baseline	
Visual description	From the Burragorang Lookout and picnic area there are elevated views to The Bluff, which is located within the Burragorang State Conservation Area at the eastern side of the GBMA, overlooks the deep waters of the Burragorang Valley and the Warragamba Dam. Surrounded by rocky escarpments and dense bushland, the lookout provides expansive views containing landscapes of high scenic value. While this view includes forested wilderness covered by natural vegetation, it does not include the iconic landforms of the Blue Mountains being the striking vertical cliffs, waterfalls, ridges and escarpments, narrow sandstone canyons and pagoda rock formations.
Elevation	About 590 metres (1,930 ft) above sea level
Visual sensitivity	High This is a unique view to an area with scenic values recognised by the State.
2033 scenario	
Visual sensitivity	High This sensitivity level would be maintained as this is a view to areas of the Burragorang State Conservation Area at the eastern side of the GBMA.
Magnitude of change	Low This view would include: • planes overhead on RWY23 departures (D12, D13 and D14) at an altitude of between 8,000–10,500 ft (about 2.5–3.2 km), about 6,200 ft (1.9 km) above the surrounding hills, with about 19 flights on average, up to a maximum of 40 flights, per day • RWY05 arrivals (A3) to the north, at a distance of about 3.5 km, at an altitude of about 5,000 ft (about 1.6 km), about 3,200 ft (about 1 km) above the surrounding hills, with about 21 flights on average, up to 51 flights per day. Overall, due to the proximity of the flights to the surrounding hills and frequency of flights there would be a noticeable change to the amenity of this view and a moderate magnitude of change.
Visual Impact	**Moderate**
2055 scenario	
Visual sensitivity	High This sensitivity level would be maintained as this is a view to areas of the Burragorang State Conservation Area at the eastern side of the GBMA.
Magnitude of change	Moderate This view would include planes on the same flight paths and altitudes, with the frequency of flights increasing, including: • RWY23 departures (D12, D13 and D14), to 56 flights on average, up to a maximum of 108 flights, per day • RWY05 arrivals (A3), to 62 flights on average, up to a maximum of 136 flights, per day. Overall, due to the height in relation to the surrounding hills and increasing frequency of flights, there would not be a noticeable change to the amenity of this view, and a moderate magnitude of change.
Visual impact	**High-Moderate**

Viewpoint 10: View from The Rock Lookout

Figure 8.13 View north from The Rock lookout, Blue Mountains National Park

Figure 8.14 View south from The Rock lookout, Blue Mountains National Park

Table 8.11 Viewpoint 10: Views from The Rock Lookout

Viewpoint 10	View from The Rock Lookout
2022 baseline	
Visual description	Figure 8.13 and Figure 8.14 show an elevated view from The Rock lookout, at the eastern side of the GBMA, including the deep valley of the Nepean River, surrounded by dense bushland. The lookout provides views of areas containing high scenic value, within an area of national importance. While this view includes forested wilderness covered by natural vegetation, it does not include the iconic landforms of the Blue Mountains being the striking vertical cliffs, waterfalls, ridges and escarpments, narrow sandstone canyons and pagoda rock formations.
Elevation	About 140 metres (460 ft) above sea level
Visual sensitivity	High This is a unique view to an area with scenic values recognised by the State.
2033 scenario	
Visual sensitivity	High - This sensitivity level would be maintained as this is a view to areas within the GBMA.
Magnitude of change	Low Looking north this view would include: • RWY05 arrivals (A1, A2 and A4) overhead at an altitude of about 10,500 ft (about 3.2 km), and about 10,100 ft (3 km) above the surrounding hills, with 23 flights on average, up to a maximum of 55 flights, per day • RWY05 departures (D4) at a distance of 8 km and a height of 8,000 ft (about 2.4 km) above sea level, with 9 flights on average, up to a maximum of 20 flights, per day • RWY23 arrivals (A7) would fly overhead at a height of 8,000 ft (about 2.4 km) above sea level, and about 7,600 ft (2.3 km) above the nearby hills, with 24 flights on average, up to a maximum of 51 flights, per day. Looking southwest this view would include: • RWY05 arrivals (A1, A2 and A4) overhead at a height of 10,500 ft (about 3.2 km) above sea level, and about 10,100 ft (3 km) above the nearby hills, with 23 flights on average, up to a maximum of 55 flights, per day • RWY23 arrivals (A7) overhead at a height of 8,000 ft (about 2.4 km) above sea level, and about 7,600 ft (2.3 km) above the nearby hills, with 24 flights on average, up to a maximum of 51 flights, per day • there may also be some departure flights visible in the background. This lookout is located under several arrival flight paths and there may also be some departure flights visible in the background of these views. Planes would be seen crossing over the Nepean River valley, and over this viewpoint and likely in both directions. These planes would, however, be at higher altitudes (of over 7,000 ft, 2.3 km) and be less visually prominent. The additional planes visible in this area would somewhat intrude upon the wilderness character of this view. Overall, there would be a slight change to the amenity of this view, and a low magnitude of change.
Visual impact	**Moderate**

Viewpoint 10	View from The Rock Lookout
2055 scenario	
Visual sensitivity	High This sensitivity level would be maintained as this is a view to areas within the GBMA.
Magnitude of change	Low Looking north planes would follow the same paths at the same altitudes, with the frequency increasing, including: • RWY05 arrivals (A1, A2 and A4), to 59 flights on average, up to a maximum of 138 flights, per day • RWY05 departures (D4), to 21 flights on average, up to a maximum of 47 flights, per day • approaching RWY23 (A7), to 69 flights on average, up to a maximum of 136 flights, per day. Looking south planes would follow the same paths at the same altitudes, with a frequency of planes increasing, including: • RWY05 arrivals (A1, A2 and A4), to 59 flights on average, up to a maximum of 138 flights, per day • RWY23 arrivals (A7), to 69 flights on average, up to a maximum of 136 flights, per day. The increasing frequency would intrude somewhat upon the wilderness character of this view, slightly reducing the amenity of this view. Overall, due to the height of the planes in this area, there would continue to be a slight change to the amenity of this view, and a low magnitude of change.
Visual impact	**Moderate**

Viewpoint 11: View from Portal lookout

Figure 8.15 View northeast from the Portal lookout, Blue Mountains National Park

Table 8.12 Viewpoint 11: View from Portal Lookout

Viewpoint 11	View from Portal Lookout
2022 baseline	
Visual description	Figure 8.15 shows an elevated view from the Portal Lookout, at the eastern side of the GBMA, overlooking the junction between Glenbrook Gorge and the Nepean River. Located on the lower ridges of the Blue Mountains National Park, the view takes in the rocky outcrops and dense bushland of the ancient riverbed opening up to the Cumberland Plains on the western suburbs of Sydney. The lookout provides expansive views containing very high scenic value of national importance. While this view includes forested wilderness covered by natural vegetation, it does not include the iconic landforms of the Blue Mountains being the striking vertical cliffs, waterfalls, ridges and escarpments, narrow sandstone canyons and pagoda rock formations.
Elevation	About 165 metres (540 ft) above sea level
Visual sensitivity	High This is a unique view to an area with scenic values important to the region and State.

Viewpoint 11	View from Portal Lookout
2033 scenario	
Visual sensitivity	High
Magnitude of change	Negligible This view would include: • RWY05 arrivals (A2) at a distance of about 3 km and an altitude of about 10,500–8,000 ft (about 3.2–2.5 km), with 8 flights on average, up to a maximum of about 19 flights, per day • RWY05 departures (D4-D6) at a distance of about 4 km and at an altitude of about 8,000 ft (about 2.4 km), with about 15 flights on average, up to a maximum of about 37 flights, per day • RWY23 arrivals (A7 and A8) at a distance of about 2 km and at a height of 8,000 ft (about 2.5 km) above sea level, with 32 flights on average, up to a maximum of about 68 flights, per day. There would be planes seen intermittently over the rural fringe areas of Penrith in the mid to background of this view (a distance of about 5 km). These planes would be at high altitudes (of over 8,000 ft, 4 km) and be less visually prominent due to the distance and altitude. The planes would be somewhat compatible with the rural and urban fringe areas and would not noticeably reduce the amenity of this view. Overall, there would be no perceived change to the amenity of this view and a negligible magnitude of change.
Visual impact	**Negligible**
2055 scenario	
Visual sensitivity	High This is a unique view to an area with scenic values important to the region and State.
Magnitude of change	Negligible Planes would follow the same flight paths at the same altitudes, with a frequency of planes increasing, including: • RWY05 arrivals (A2), to 19 flights on average, up to a maximum of about 45 flights, per day • RWY05 departures (D4-D6), to 46 flights on average, up to a maximum of about 104 flights, per day • RWY23 arrivals (A7 and A8), to 93 flights on average, up to a maximum of about 184 flights, per day. There would be an increase in the frequency of planes visible over the rural fringe areas of Penrith in the mid to background of this view. Overall, there would be no perceived change in the amenity of this view and a negligible magnitude of change.
Visual impact	**Negligible**

Viewpoint 12: View from Hawkesbury lookout

Figure 8.16 View northwest from the Hawkesbury lookout, Yellomundee Regional Park

Table 8.13 Viewpoint 12: View from Hawkesbury Lookout

Viewpoint 12	View from Hawkesbury Lookout
2022 baseline	
Visual description	Figure 8.16 shows an elevated view from the Hawkesbury Lookout, located along Hawkesbury Road in between the Hawkesbury region and the Blue Mountains, within the Yellomundee Regional Park, near at the eastern edge of the GBMA. The roadside lookout offers southwestern views looking across the Cumberland Plain including the Nepean River, Wianamatta Park and Penrith, and is a popular rest-stop enroute to the Blue Mountains and is of regional importance.
Elevation	About 220 metres (715 ft) above sea level
Visual sensitivity	Moderate This is a unique view to an area with scenic values important to the region.

Viewpoint 12	View from Hawkesbury Lookout
2033 scenario	
Visual sensitivity	Moderate This is a unique view to an area with scenic values important to the region.
Magnitude of change	Low This view would include: • RWY05 departures (D1, D2 and D3) would fly overhead at a height of about 10,500 ft (about 3.2 km), with 23 flights on average, up to a maximum of about 55 flights, per day. These planes will be seen intermittently, crossing over the Cumberland Plain as they ascend steeply towards a cruising altitude. These planes would be somewhat prominent in the view due to flying overhead within an expansive open sky. There will also be planes visible in the background, as they come into land on several flight paths from the north and east. Overall, there would be a noticeable reduction in the amenity of this view, and a low magnitude of change.
Visual impact	**Moderate-Low**
2055 scenario	
Visual sensitivity	Moderate This is a unique view to an area with scenic values important to the region.
Magnitude of change	Low Planes would follow the same paths and be at the same altitude, with a frequency of planes increasing, including: • RWY05 departures (D1, D2 and D3) increasing to 69 flights on average, up to a maximum of 158 flights, per day. There would be an increase in the frequency of planes visible as they fly overhead in this view. Overall, due to the proximity of the planes to this viewpoint, there would be a noticeable reduction in the amenity of this view and a low magnitude of change.
Visual impact	**Moderate-Low**

Viewpoint 13: View from Wynnes Rocks Lookout

Figure 8.17 View southeast from Wynnes Rocks Lookout

Table 8.14 Viewpoint 13: View from Wynnes Rocks Lookout

Viewpoint 13	View from Wynnes Rocks Lookout
2022 baseline	
Visual description	Figure 8.17 shows an elevated view from the Wynnes Rocks Lookout. Located on the ridgeline spur at the end of Wynnes Rocks Road south of Mount Wilson, it offers expansive views southeast over the GBMA and BMNP across Bowen's Creek to the Blue Mountains towns and Mounts Tomah, Hay and Banks. While this view includes forested wilderness covered by natural vegetation, it does not include the iconic landforms of the Blue Mountains being the striking vertical cliffs, waterfalls, ridges and escarpments, narrow sandstone canyons and pagoda rock formations.
Elevation	About 980 metres (3,200 ft) above sea level
Visual sensitivity	High This is a unique view to an area with scenic values important to the State.

Viewpoint 13	View from Wynnes Rocks Lookout
2033 scenario	
Visual sensitivity	High This is a unique view to an area with scenic values important to the State.
Magnitude of change	Low This view would include: • RWY05 departures (D1) would fly overhead at a height between 13,300–17,500 ft (about 4–5 km) above sea level, and about 10,100 ft (3 km) above Mount Tomah (seen in this view), with 15 flights on average, up to a maximum of about 36 flights, per day • RWY23 departures (D10) would fly overhead at a height between 13,300–17,500 ft (about 4–5 km) above sea level, and about 10,100 ft (3 km) above Mount Tomah, with 18 flights on average, up to a maximum of about 36 flights, per day. There would be planes seen intermittently overhead at high altitudes. The planes visible in this area would be more frequent. Overall, the planes would not noticeably intrude upon the wilderness character of this view and there would be a negligible magnitude of change.
Visual impact	**Moderate**
2055 scenario	
Visual sensitivity	High This is a unique view to an area with scenic values important to the State.
Magnitude of change	Low Planes would follow the same paths and be at the same altitudes, with a frequency of planes increasing, including: • RWY05 departures (D1), to 42 flights on average, up to a maximum of 97 flights, per day • RWY23 departures (D10), to 52 flights on average, up to a maximum of 97 flights, per day. While this lookout would be frequently overflown by planes in this scenario, due to the altitude these planes would not be prominent in this view. Overall, the planes would slightly intrude upon the wilderness character of this view and there would be a noticeable reduction in the amenity of this view, and a low magnitude of change.
Visual impact	**Moderate**

Viewpoint 14: View from Walls Lookout

Figure 8.18 View from Walls Lookout

Table 8.15 Viewpoint 14: View from Walls Lookout

Viewpoint 14	View from Walls Lookout
2022 baseline	
Visual description	Figure 8.18 shows an elevated view from the Walls Lookout, at the western side of the GBMA, overlooking the Grose Valley. Surrounded by rocky escarpments and bushland defining the Little Blue Gum canyon, the Walls Lookout is representative of several other lookouts in the immediate area (including for example Mt Banks Picnic Area and Lookout, Victoria Falls Lookout, Baltzer Lookout and Anvil Rock Lookout). These lookouts provide expansive views containing very high scenic value, of national importance. This view includes iconic landforms of the Blue Mountains including striking vertical cliffs and sandstone canyons.
Elevation	About 865 metres (2,840 ft) above sea level
Visual sensitivity	Very high This is a unique and heavily experienced view to an area with scenic values of national and international importance.

Viewpoint 14	View from Walls Lookout
2033 scenario	
Visual sensitivity	Very high This sensitivity level would be maintained as this is a view to areas of the GBMA.
Magnitude of change	Negligible This view would include: • RWY05 departures (D2) overhead at an altitude of about 17,500 ft (about 5.3 km), and about 15,100 ft (4.6 km) above the escarpments, with 3 flights on average, up to a maximum of 8 flights, per day. This view would be overflown by planes infrequently, and at high altitude. There will also be planes visible in the background, as they depart on several flight paths to the south. While these planes would be viewed in an open and expansive sky, these planes would not be prominent in this view and infrequently seen. Overall, these flights would not noticeably intrude upon the wilderness character of this view and there would be a negligible magnitude of change.
Visual impact	**Negligible**
2055 scenario	
Visual sensitivity	Very high This sensitivity level would be maintained as this is a view to areas of the GBMA.
Magnitude of change	Low Planes would follow the same paths and be at the same altitude, with frequency of planes increasing, including: • RWY05 departures (D2) to 18 flights on average, up to a maximum of 42 flights, per day. While from this lookout planes would be seen at a relatively high altitude, they would be viewed in an open and expansive sky, and more likely to detract from the amenity of these views due to the increased frequency of their movement across the sky. As movement attracts the eye, and this is an otherwise still and natural view, these flights have the potential to intrude upon the wilderness character of this view. Overall, due to the increased frequency, there would be a noticeable reduction in the amenity of this view.
Visual impact	**High-Moderate**

Viewpoint 15: View from Echo Point Lookout

Figure 8.19 View south east from Echo Point Lookout to The Three Sisters and Mount Solitary

Refer also to Appendix A – Photomontages, A3 plates.

Table 8.16 Viewpoint 15 View from Echo Point Lookout

Viewpoint 15	Views from Echo Point
2022 baseline	
Visual description	Figure 8.19 shows an elevated view from Echo Point lookout, at Katoomba. It is listed as one of the 15 'best scenic lookouts' (listed by Destination NSW, 2022) and offers panoramic views across the GBMA including the Three Sisters, the Jamison Valley, Mount Solitary and Narrow Neck. The lookout provides views of areas containing very high scenic value, of national importance. This view includes iconic landforms of the Blue Mountains including striking vertical cliffs, sandstone canyons and pagoda rock formations.
Elevation	About 950 metres (3,110 ft) above sea level
Visual sensitivity	Very high This is a unique and heavily experienced view to an area with scenic values of national and international importance.

Viewpoint 15	Views from Echo Point
2033 scenario	
Visual sensitivity	Very high This sensitivity level would be maintained as this is a view to areas of the GBMA.
Magnitude of change	Low This view would include: • RWY05 departures (D4-D6) at a distance of about 11 km will fly at an altitude of between 13,300–17,500 ft (about 4–5 km), and about 10,200 ft (about 3 km) above Mt Solitary, with about 15 flights on average, up to 37 flights, per day • RWY23 departures (D11) at a distance of about 4.5 km at an altitude of 13,300 ft (about 4 km), and about 10,200 ft (about 3 km) above Mount Solitary, with about 10 flights on average, up to 19 flights, per day. There would be planes seen intermittently crossing this view, over and beyond Mount Solitary (about 927 metres above sea level). These planes would be viewed in an open and expansive sky, from an elevated vantage point, increasing their prominence in the view. Overall, while the planes would be visible moving across the view, the scale of the planes at this distance, and their infrequency, would reduce the potential for them to noticeably intrude upon the wilderness character of this view. Overall, there would be a slight reduction in the amenity of this view and a negligible magnitude of change.
Visual impact	**High-Moderate**
2055 scenario	
Visual sensitivity	Very high This sensitivity level would be maintained as this is a view to areas of the GBMA.
Magnitude of change	Low Planes would follow the same flight paths and be at the same altitudes, with a frequency of planes increasing, including: • RWY05 departures (D4-D6), to 46 flights on average, up to a maximum of 104 flights, per day • RWY23 departures (D11), to 33 flights on average, up to a maximum of 62 flights, per day. The frequency of planes visible would more than double the 2033 scenario. While the planes would be small in size when viewed at this distance, with only the flights following the RWY23 departure path being perceptible, these planes would be viewed in an open and expansive sky, from an elevated vantage point, increasing their prominence in the view. As movement attracts the eye, and this is an otherwise still and expansive view, these flights have the potential to intrude upon the wilderness character of this view. Overall, there would be a slight reduction in the amenity of this view and a low magnitude of change.
Visual impact	**High-Moderate**

Viewpoint 16: View from Cleary Memorial Lookout, Kedumba Pass

Figure 8.20 Cleary memorial lookout, Kedumba Pass

Table 8.17 Viewpoint 16 View from Cleary Memorial Lookout, Kedumba Pass

Viewpoint 16	Views from Cleary Memorial Lookout
2022 baseline	
Visual description	Figure 8.20 shows an elevated view from the Cleary Memorial Lookout, at the Kedumba Pass. It is located off the fire trail and is currently overgrown, offering limited views across the GBMA. The lookout offers glimpsed views of areas containing high scenic value including views to Mount Solitary. However, this viewpoint is not formalised and would attract a relatively small number of visitors compared to the more accessible viewing locations. Aircraft flying over Katoomba and this part of the Blue Mountains are visible from this location.
Elevation	About 620 metres (2,030 ft) above sea level
Visual sensitivity	High This is an infrequently experienced view to an area with scenic values of importance to the Nation.

Viewpoint 16	Views from Cleary Memorial Lookout
2033 scenario	
Visual sensitivity	High This sensitivity level would be maintained as this is a view to areas of the GBMA.
Magnitude of change	Low This view would include: • RWY23 departures (D11) overhead at an altitude of 10,500 ft (about 3.2 km), and about 9,700 ft (2.9 km) above the ranges. With 10 flights on average, up to 19 flights, per day • RWY05 departures (D4-D6) at a distance of about 3 km, at an altitude of about 13,300 ft (about 4 km), and about 11,300 ft (3.4 km) above the ranges. With about 15 flights on average, up to a maximum of 37 flights, per day • RWY23 arrivals (A7) at a distance of about 6 km at an elevation of between 10,500–13,300 ft (about 3.2–4 km), and about 11,000 ft (3.3 km) above the ranges. With about 24 flights on average, up to a maximum of 51 flights, per day. Planes on the departing flight path from RWY23 (D11) would be visible overhead or passing across the middle ground of views from this lookout. However, these planes would be at a high altitude and relatively infrequent. These flights would be seen in between overgrown vegetation, which currently partly encloses the lookout, restricting views out. Overall, due to the relatively close proximity and contrast with the otherwise predominantly wilderness view, there would be a slight reduction in the amenity of this view and a low magnitude of change in this view.
Visual impact	**Moderate**
2055 scenario	
Visual sensitivity	Moderate
Magnitude of change	Low Planes would follow the same paths at the same altitudes, with the frequency increasing, including: • RWY23 departures (D11), to 33 flights on average, up to a maximum of 62 flights, per day • RWY05 departures (D4-D6), to 46 flights on average, up to a maximum of 104 flights, per day • RWY23 arrivals (A7), to 69 flights on average, up to a maximum of 136 flights, per day. The frequency of planes travelling along departing flight paths from RWY23 would be slightly increased, with planes visible overhead or passing across the middle ground of this view. These flights would be several km overhead and relatively infrequent however, due to the close proximity of these flights and the contrast with the otherwise predominantly wilderness view, there would be a low magnitude of change in this view.
Visual Impact	**Moderate**

8.1.2.2 Views from campgrounds and day-use areas

There are many campgrounds within the Blue Mountains area offering opportunities for overnight stays, as well as for day-use, including picnicking, hiking and swimming in the many rivers, creeks and waterfalls in the Greater Blue Mountains. Refer to Figure 8.21 and Figure 8.22. Many of the campgrounds are remote with limited access for vehicles and no fresh drinking water while others offer basic facilities such as toilets and picnic facilities. Some of these sites include the Euroka campground south of Glenbrook, Acacia Flat campground and Burralow Creek campground in the Grose Valley wilderness areas, Dunphys campground at the end of Megalong Valley, Katoomba River crossing campground in the Jamison Valley, and Murphys Glen campground south of Woodford. The Ingar campground, located between Wentworth Falls and Woodford, is a popular campground and day-use area offering picnic facilities and places to swim. Some of the remote wilderness areas of the GBMA and other protected areas in the region, such as the Burragorang State Conservation Area, do not have designated campgrounds and would generally be used by people for day-use only. Table 8.18 includes an assessment of the impact on views from campgrounds and day-use areas.

Table 8.18 Views from campgrounds and day-use areas

Campgrounds and day-use areas	
2022 baseline	
Sensitivity	High The many camp sites and day-use areas within the Blue Mountains offer a variety of activities and experiences. They are generally located in areas of high scenic quality and are experienced by concentrations of recreational users.
2033 scenario	
Sensitivity	High This sensitivity level would be maintained as these campgrounds are contained within the GBMA.
Magnitude of change	Low From most of the campgrounds within the Blue Mountains, views are enclosed by trees so that the opportunity to view any flights would be restricted to those overhead and within the area of visible sky. Views to flights would be viewed occasionally, at a distance. Planes are more likely to be visible from: • Murphys Glen campground and Euroka campground, which are both potentially overflown by 3 flight paths. – Murphys Glen will be overflown by RWY05 departures (D4-D6), with up to 15 flights on average, up to a maximum of 37 flights, per day – Euroka campground will be overflown by RWY23 arrivals (A7), with 24 flights on average, up to a maximum of 51 flights, per day. The planes along these flight paths are likely to be at higher altitudes between 8,000–10,500 ft (2.4–3.2 km). • Wentworth Falls and Katoomba Falls, where there would be views to RWY23 departures (D11) at a distance of 5 to 7 km, and an altitude of about 13,300 ft (4 km). With 10 flights on average, up to a maximum of 19 flights, per day. Mount Banks Picnic Area and lookout, which would be overflown by RWY05 departures (D2) at an altitude of about 17,500 ft (5.3 km). There would be 3 flights on average, up to a maximum of 8 flights, per day. Overall, the effect of the project on campgrounds and day-use areas would result in a slight reduction in the amenity of views and a low magnitude of change.
Visual impact	**Moderate**

Campgrounds and day-use areas	
2055 scenario	
Sensitivity	High This sensitivity level would be maintained as these campgrounds are contained within the GBMA.
Magnitude of change	Low The flights would follow the same paths at the same elevations, and increase in frequency, including: • Murphys Glen campground, where RWY05 departures (D4-D6), would increase to 46 flights on average, up to a maximum of 104 flights, per day • Euroka campground, where RWY23 arrivals (A7) would increase to 69 flights on average, up to a maximum of 136 flights, per day • Wentworth and Katoomba Falls, where RWY23 departures (D11) would increase to about 33 flights on average, up to a maximum of 62 flights, per day • Mount Banks Picnic Area and lookout, where RWY05 departures (D2) would increase up to 18 flights on average, up to 42 flights, per day. Due to the increase in the frequency of flights, there would potentially be more flights seen from campgrounds and day-use areas that are open and/or elevated. Overall, the effect of the project on campgrounds and day-use areas would result in a slight reduction in the amenity of views and a low magnitude of change.
Visual impact	**Moderate**

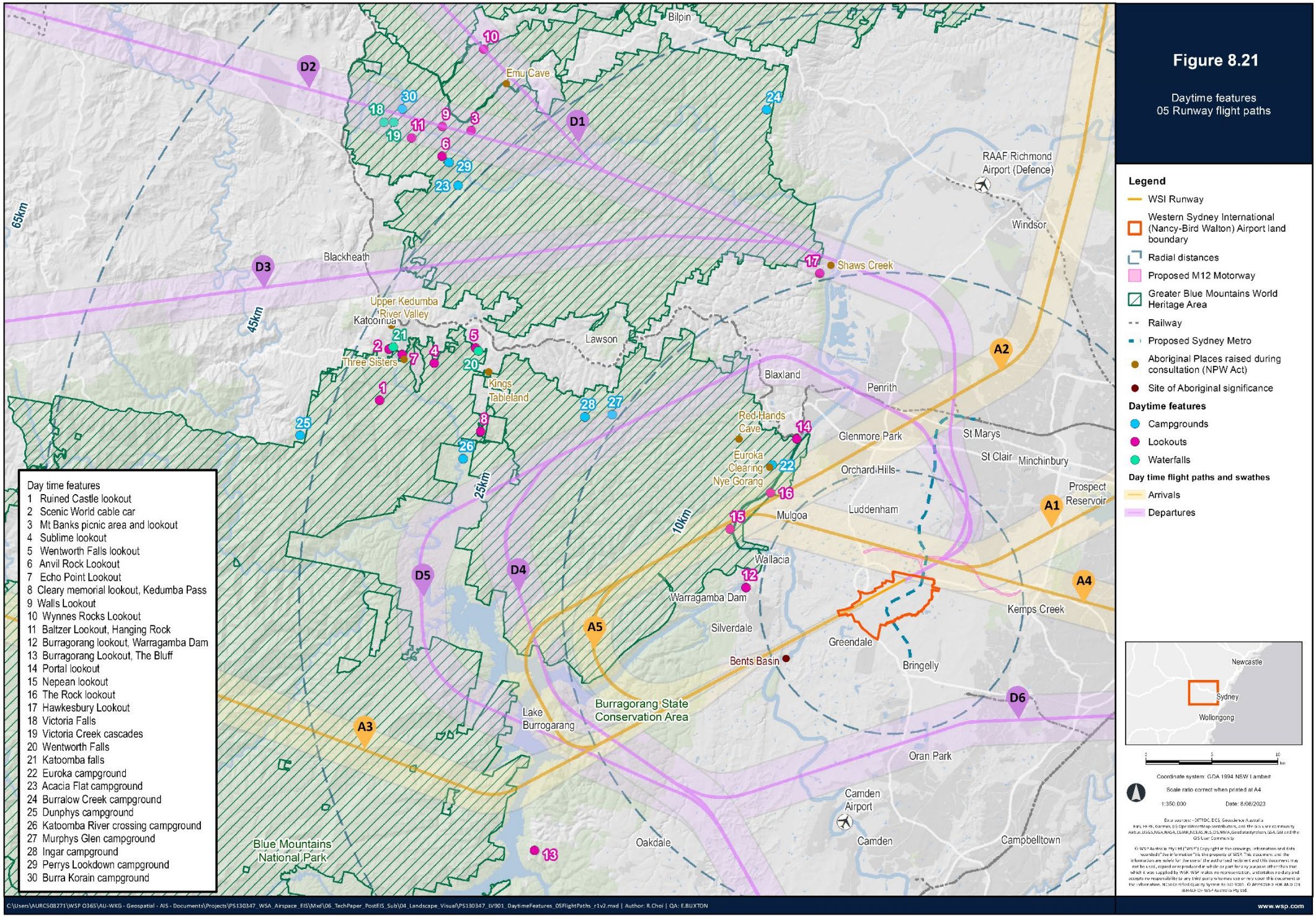


Figure 8.21

Daytime features
05 Runway flight paths

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Daytime features

- Campgrounds
- Lookouts
- Waterfalls

Day time flight paths and swathes

- Arrivals
- Departures

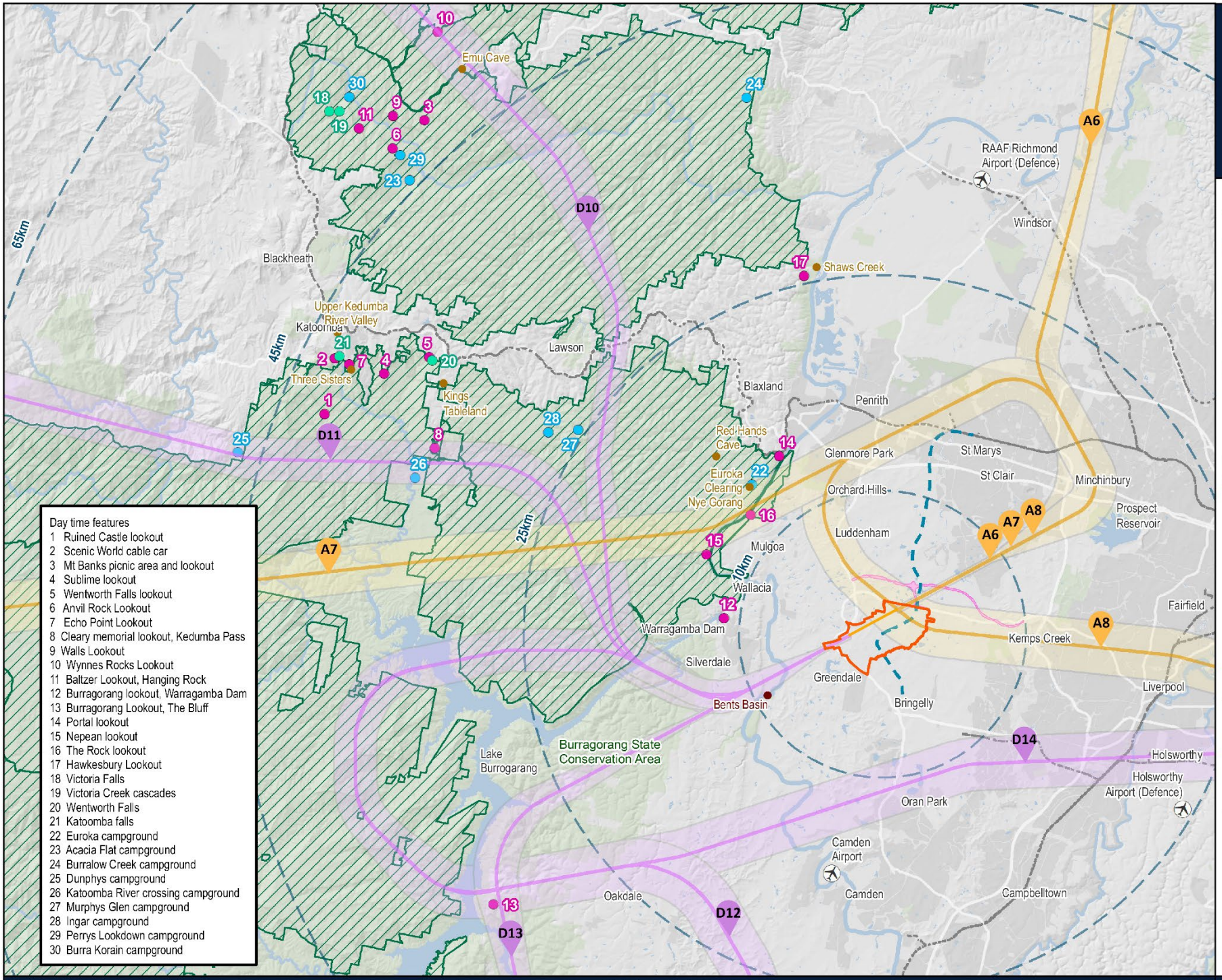


Figure 8.22

Daytime features
23 Runway flight paths

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Greater Blue Mountains World Heritage Area
- Railway
- Proposed Sydney Metro
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Day time flight paths and swathes

- Arrivals
- Departures

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 8/08/2023

8.1.2.3 Views from scenic routes

The Greater Blue Mountains scenic drive offers a 'winding, edge-of-the-world drive around the cliff tops' (NSW Government, 2023) providing scenic views as well as opportunities to stop and appreciate the view from lookouts and other vantage points. Refer to Figure 8.23 and Figure 8.24.

The *Greater Blue Mountains Drive Map* (NSW Government, 2022) identifies 1,200 km of scenic drives and 'feature routes' in the Blue Mountains which border the GBMA's of Wollemi National Park and Blue Mountains National Park. The feature routes also include east-west connections from Penrith via the Great Western Highway as it winds through the Greater Blue Mountains, via the escarpment areas of Katoomba, and the Wentworth Falls area, and Blackheath, to a fork in the road (to Lithgow in the north, or Oberon, to the south). The section of Bells Line of Road also offers east-west 'feature routes' between Kurrajong via Bilpin and Mount Victoria, through the Grose Valley area, overlooking the Blue Gum Forest of Pierces Pass and the Grose River and its tributaries, to Lithgow.

Table 8.19 includes an assessment of the impact on views from scenic routes.

Table 8.19 Assessment of views from scenic routes

Views from scenic routes	
2022 baseline	
Sensitivity	Moderate The winding, undulating roads of the Great Western Highway and Bells Line of Road offer opportunities for open or semi-enclosed views to the Blue Mountains landforms. Views from these routes are experienced by large numbers of people and are used with the intention of appreciating views.
2033 scenario	
Sensitivity	Moderate Views from these scenic routes would continue to be to areas of within the GBMA and towns of the Blue Mountains.
Magnitude of change	Low There are some flight paths which will fly over sections of scenic routes, including the: • Great Western Highway at Warrimoo where RWY05 departures (D4-D6) would cross at an altitude of between 8,000–10,500 ft (about 2.4–3.2 km) with 15 flights on average, up to 37 flights, per day • Great Western Highway near Linden where RWY23 departures (D10) would cross at an altitude of between 10,500–13,300 ft (3.2–4 km) with 18 flights on average, up to a maximum of 36 flights, per day • Great Western Highway, at Hartley, where RWY05 departures (D2) planes are likely to be at very high altitudes of about 20,000 ft (6 km), with 3 flights on average, up to a maximum of 8 flights, per day • Bells Line of Road, at Mount Tomah, where RWY05 departures (D1) at about 17,500 ft (5.3 km) with 15 flights on average, up to a maximum of 36 flights, per day • Bells Line of Road, near Grose Valley, where RWY05 departures (D2) at an altitude of 17,500 ft (5.3 km) at about 3 flights on average, up to a maximum of 8 flights, per day. Overall, the planes flying over sections of the feature routes may be visible passing overhead where there is no intervening vegetation, however, they would generally be seen at high or very high altitudes between 8,000–20,000 ft (2.5–6 km). Overall, there would be a slight reduction in the amenity of views from these routes and a low magnitude of change.
Visual impact	**Moderate-Low**

Views from scenic routes	
2055 scenario	
Sensitivity	Moderate Views from these scenic routes will continue to be to areas of high scenic quality.
Magnitude of change	Low There would be an increase in frequency of flights over sections of the Great Western Highway, to about 52 flights on average, up to a maximum of 104 flights, per day at Warrimoo (RWY05 departures, D4-D6) and near Linden (RWY23 departures, D10). There would also be an increase in flights over sections of Bells Line of Road, to about 42 flights on average, up to a maximum of 97 flights, per day at Mount Tomah (RWY05 departures, D1), and an increase to 18 flights on average, up to a maximum of 42 flights per day near Grose Valley (RWY05 departures (D2). Overall, the increase in frequency may be noticeable from sections of the scenic feature routes (where views are open), however, they would be experienced generally by few people as a glimpsed view of planes at high or very high altitudes. There would continue to be a slight reduction in the amenity of views from these routes, and a low magnitude of change.
Visual impact	**Moderate-Low**

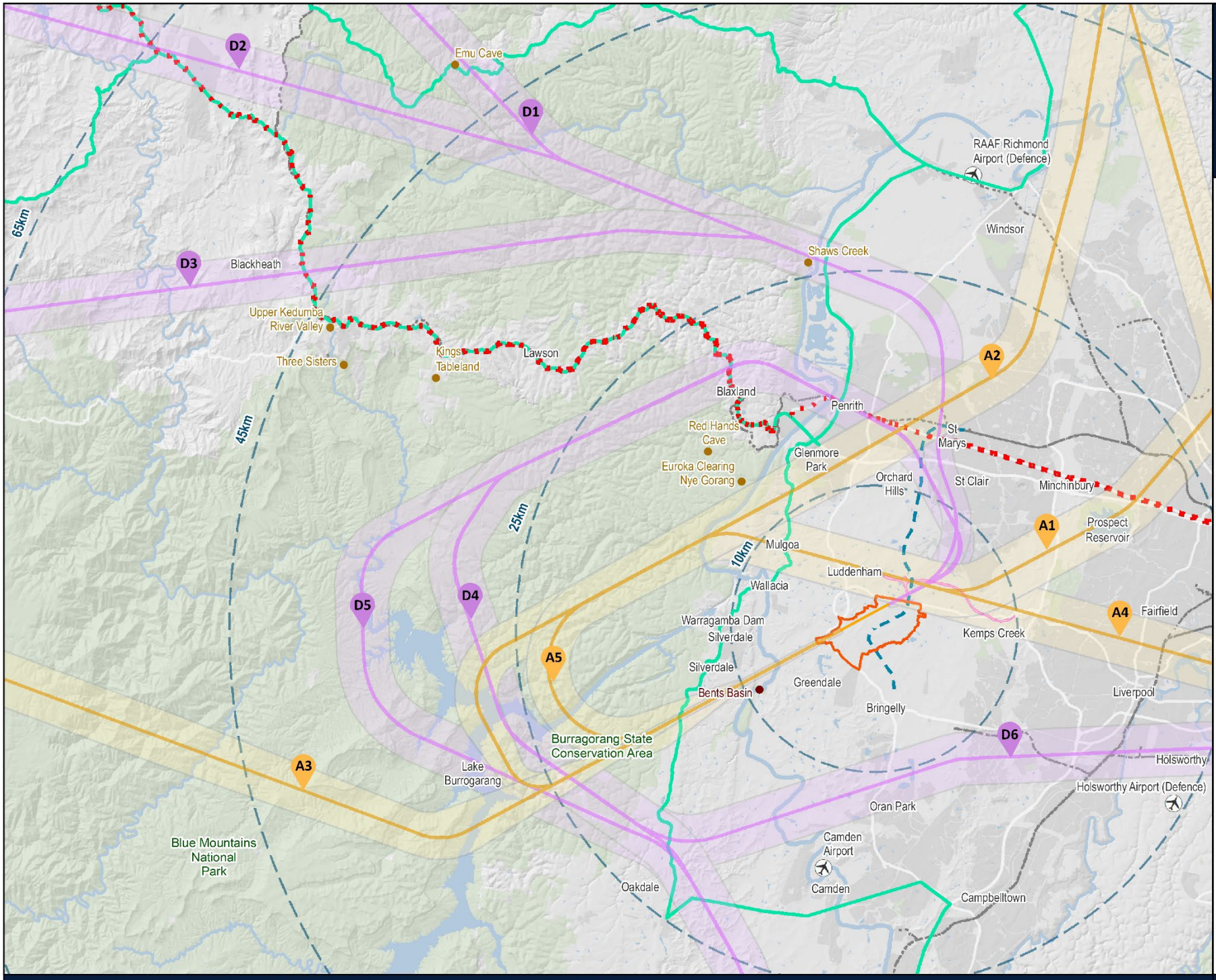


Figure 8.23

Scenic routes
05 Runway flight paths

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Railway
- Proposed Sydney Metro
- The Great Western Highway
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Scenic Routes

- Greater Blue Mountains Drive

Day time flight paths and swathes

- Arrivals
- Departures

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 9/08/2023

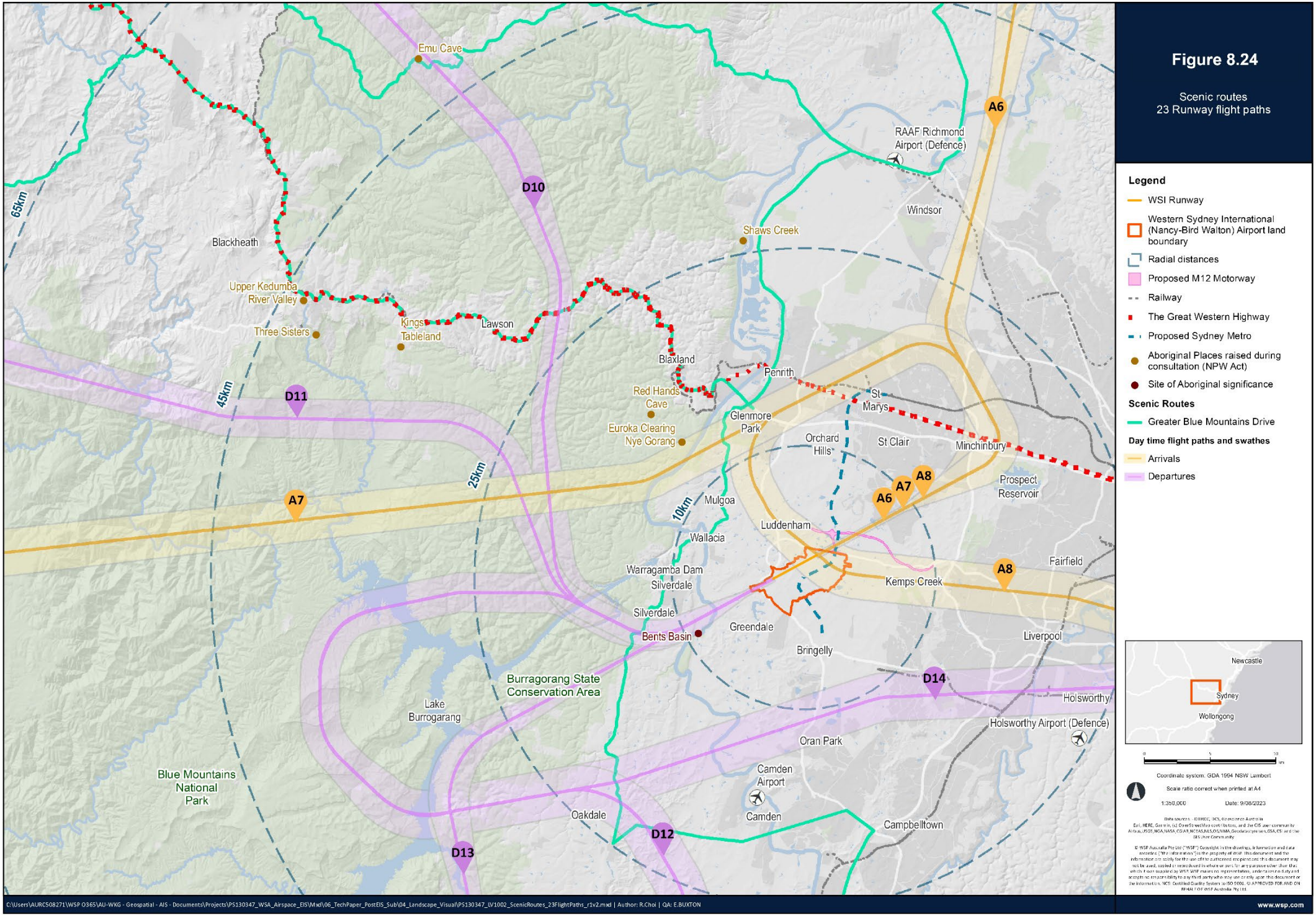


Figure 8.24

Scenic routes
23 Runway flight paths

Legend

- WSI Runway
- Western Sydney International (Nancy-Bird Walton) Airport land boundary
- Radial distances
- Proposed M12 Motorway
- Railway
- The Great Western Highway
- Proposed Sydney Metro
- Aboriginal Places raised during consultation (NPW Act)
- Site of Aboriginal significance

Scenic Routes

- Greater Blue Mountains Drive

Day time flight paths and swathes

- Arrivals
- Departures

Coordinate system: GDA 1994 NSW Lambert

Scale ratio correct when printed at A4

1:350,000 Date: 9/08/2023

8.1.2.4 Summary of visual impacts – The Blue Mountains

The following table summarises the visual impacts of views in The Blue Mountains.

Table 8.20 Visual impact assessment summary table – Views from The Blue Mountains

Viewpoint (VP)	2022 baseline	2033 scenario			2055 scenario		
	Sensitivity	Sensitivity	Magnitude	Visual impact	Sensitivity	Magnitude	Visual impact
Lookouts							
VP9 – View from the Burragorang Lookout, The Bluff	H	H	L	**M**	H	M	**H-M**
VP10 – View from The Rock Lookout	H	H	L	**M**	H	L	**M**
VP11 – View from Portal Lookout	H	H	N	N	H	N	N
VP12 – View from Hawkesbury Lookout	M	M	L	**M-L**	M	L	**M-L**
VP13 – View from Wynnes Rocks Lookout	H	H	L	M	H	L	**M**
VP14 – View from Walls Lookout	VH	VH	N	N	VH	L	**H-M**
VP15 – View from Echo Point Lookout	VH	VH	L	**H-M**	VH	L	**H-M**
VP16 – View from Cleary Memorial Lookout, Kedumba Pass	H	H	L	**M**	M	L	**M**
Campgrounds and day-use areas							
Including: Murphys Glen campground, Euroka campground, Wentworth Falls and Katoomba Falls, Mount Banks Picnic Area and lookout	H	H	L	**M**	H	L	**M**
Scenic routes							
The Great Western Highway and Bells Line of Road	M	M	L	**M-L**	M	L	**M-L**

Key: N = Negligible, VL = Very Low, L = Low, M-L = Moderate-Low, M = Moderate, H-M = High-Moderate, H = High, VH = Very High

8.2 Assessment of night-time visual impacts

The night time flight paths account for flights between 11 pm and 05:30 am. In addition to this, the day time flight paths would operate during periods of darkness, between sunset and 11pm. This assessment considers both the night flight paths and those described as 'day time' flights that would occur during the early evening hours. Refer to Figure 8.25 and Figure 8.26.

This assessment will consider the following night time settings:

- Areas of High district brightness (A4) – Western Sydney
- Areas of Medium district brightness (A3) – Western Sydney
- Areas of Medium district brightness (A3) – Blue Mountains
- Intrinsically Dark landscapes (AO) – Blue Mountains.

The following sections summarise the assessment of visual impact at night.

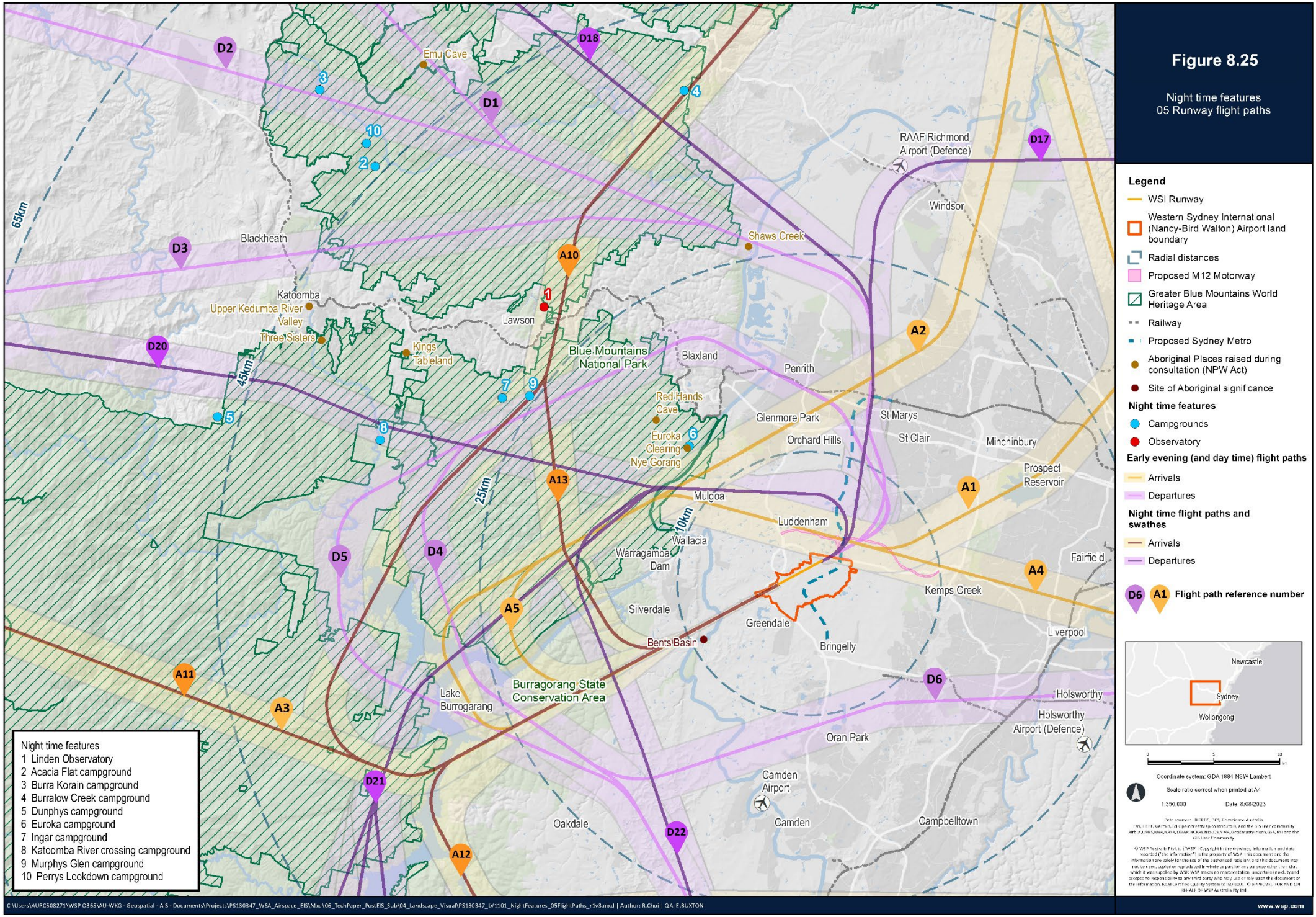


Figure 8.25
Night time features
05 Runway flight paths
Legend
WSI Runway
Western Sydney International (Nancy-Bird Walton) Airport land boundary
Radial distances
Proposed M12 Motorway
Greater Blue Mountains World Heritage Area
Railway
Proposed Sydney Metro
Aboriginal Places raised during consultation (NPW Act)
Site of Aboriginal significance
Night time features
Campgrounds
Observatory
Early evening (and day time) flight paths
Arrivals
Departures
Night time flight paths and swathes
Arrivals
Departures
D6 A1 Flight path reference number
Night time features
1 Linden Observatory
2 Acacia Flat campground
3 Burra Korain campground
4 Burralow Creek campground
5 Dunphys campground
6 Euroka campground
7 Ingar campground
8 Katoomba River crossing campground
9 Murphys Glen campground
10 Perrys Lookdown campground
Emu Cave
Blackheath
Katoomba
Upper Kedumba River
Valley
Three Sisters
Kings Tableland
Lawson
Blue Mountains National Park
Shaws Creek
RAAF Richmond Airport (Defence)
Windsor
Blaxland
Penrith
Red Hands Cave
Euroka Clearing
Nye Gorang
Glenmore Park
Orchard Hills
St Marys
St Clair
Minchinbury
Prospect Reservoir
Mulgoa
Luddenham
Wallacia
Warragamba Dam
Fairfield
Kemps Creek
Silverdale
Greendale
Bringelly
Liverpool
Bents Basin
Burragorang State Conservation Area
Lake Burrogarang
Holsworthy
Holsworthy Airport (Defence)
Oran Park
Camden Airport
Camden
Campbelltown
Oakdale
65km
45km
25km
10km
D1
D2
D3
D4
D5
D6
D17
D18
D20
D21
D22
A1
A2
A3
A4
A5
A10
A11
A12
A13
Newcastle
Sydney
Wollongong
Coordinate system: GDA 1994 NSW Lambert
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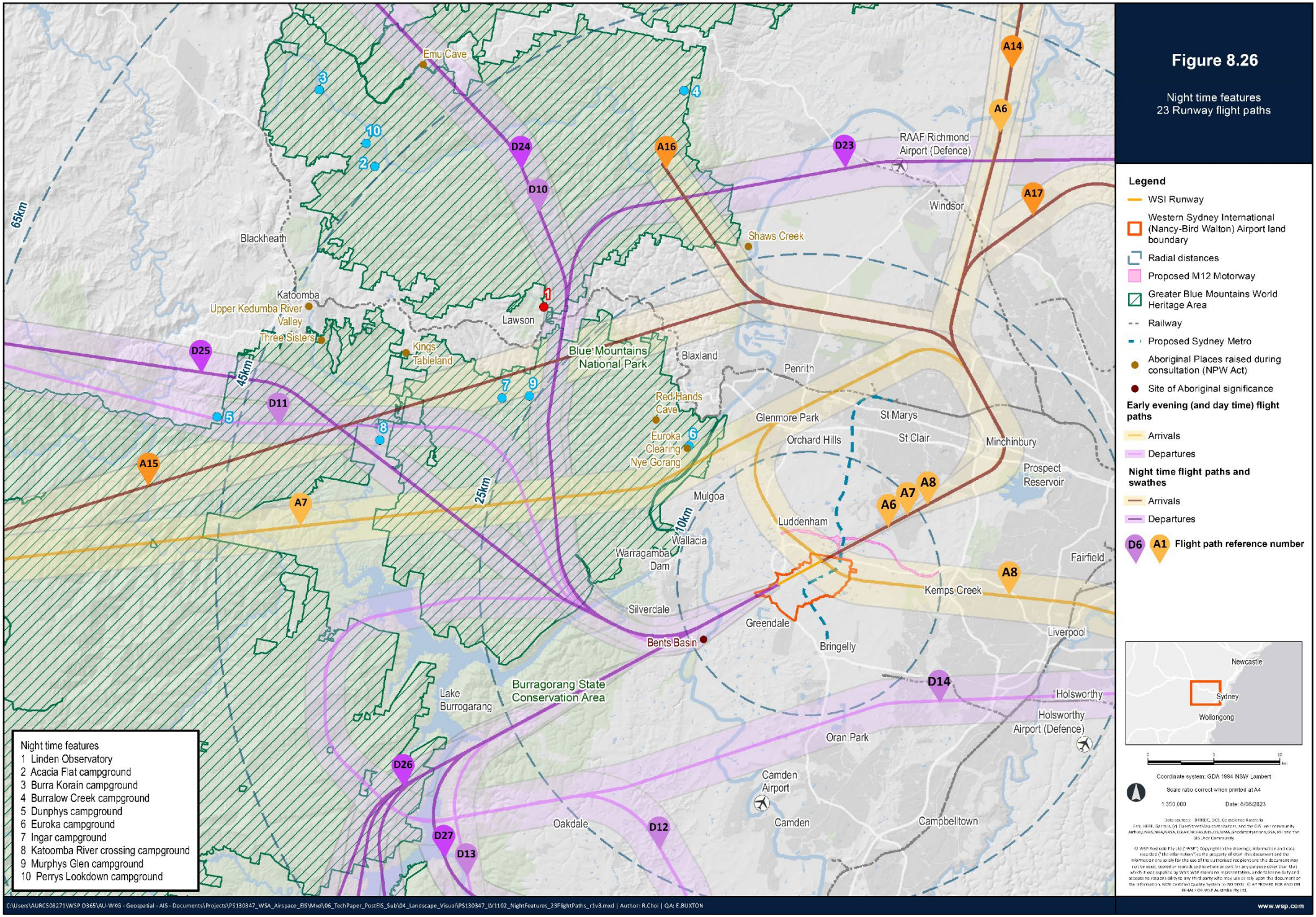
Figure 8.26
Night time features
23 Runway flight paths
Legend
WSI Runway
Western Sydney International (Nancy-Bird Walton) Airport land boundary
Radial distances
Proposed M12 Motorway
Greater Blue Mountains World Heritage Area
Railway
Proposed Sydney Metro
Aboriginal Places raised during consultation (NPW Act)
Site of Aboriginal significance
Early evening (and day time) flight paths
Arrivals
Departures
Night time flight paths and swathes
Arrivals
Departures
D6 A1 Flight path reference number
Night time features
1 Linden Observatory
2 Acacia Flat campground
3 Burra Korain campground
4 Burralow Creek campground
5 Dunphys campground
6 Euroka campground
7 Ingar campground
8 Katoomba River crossing campground
9 Murphys Glen campground
10 Perrys Lookdown campground
Emu Cave
Blackheath
Katoomba
Upper Kedumba River
Valley
Three Sisters
Kings Tableland
Lawson
Blue Mountains National Park
Shaws Creek
RAAF Richmond Airport (Defence)
Windsor
Blaxland
Penrith
Red Hands Cave
Euroka Clearing
Nye Gorang
Glenmore Park
Orchard Hills
St Marys
St Clair
Minchinbury
Prospect Reservoir
Mulgoa
Luddenham
Wallacia
Warragamba Dam
Fairfield
Kemps Creek
Silverdale
Greendale
Bringelly
Liverpool
Bents Basin
Burragorang State Conservation Area
Lake Burrogarang
Holsworthy
Holsworthy Airport (Defence)
Oran Park
Camden Airport
Camden
Campbelltown
Oakdale
65km
45km
25km
10km
A14
A6
A16
D23
A17
D24
D10
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8.2.1 Areas of high district brightness (A4)

8.2.1.1 Existing environment

The areas surrounding WSI are generally brightly lit urban areas of **high district brightness** (A4) and include suburbs such as Penrith and St Marys, Orchard Hills, Kemps Creek, Bringelly, Liverpool, Eastern Creek as well as western outskirts of Blacktown. The future Aerotropolis, including the new city centre of Bradfield, will also be brightly lit in time, as it progressively develops including a new city centre of Bradfield.

There are existing flights passing above these areas which would be generally at higher elevations and not strongly influence the character of views at night.

8.2.1.2 Visual impacts at night

The following table summarises the potential visual impacts of the project on the areas of high district brightness (A4) at night.

Table 8.21 Landscape impact – Areas of high district brightness (A4)

	Impact level	Details
2022 baseline		
Sensitivity	Very Low	These areas include bright street lighting, moving light sources from traffic, lighting from dwellings and buildings in commercial area. There is a general sky glow over these areas that limits the visibility of the sky at night.
2033 scenario		
Sensitivity	Very Low	Would continue to be brightly lit at night.
Magnitude of change	Low	All areas of high district brightness within the Western Sydney study area have the potential to be overflown or to have a view to flights at night, by a plane on a night or daytime scheduled flight path in the early evening (before 11 pm). In the early evening, areas of high district brightness (A4), that would experience views to planes at low altitudes (less than 5,000 ft) include: • RWY05 departures (D1-D6) from St Marys and Penrith, Orchard Hills • RWY23 arrivals (A6-A8) from Minchinbury, Glenmore and Penrith. At night, areas of high district brightness (A4) would experience views to planes at low altitudes (less than 5,000 ft) including: • RWY05 departures (D17-D18), with an average of 3 flights, up to a maximum of 6 flights, per night over Orchard Hills, St Marys and Penrith • RWY23 arrivals (A14-A17), with an average of 9 flights, up to a maximum of 23 flights, per night over Orchard Hills, St Marys, Eastern Creek and suburban areas on the western outskirts of Blacktown. Overall, views to the lighting on aircraft moving across the skies over Western Sydney would be experienced in views across a large portion of this urban area. However, this lighting would not contrast substantially with the surrounding landscape at night due to the existing brightly lit setting. Generally, there would be a low magnitude of change.
Visual impact	**Negligible**	

	Impact level	Details
2055 scenario		
Sensitivity	Very Low	No change.
Magnitude of change	Low	During the early evening, planes would follow the same paths and at the same altitude, with the frequency of flights increasing. At night, planes would follow the same paths and at the same altitude, with the frequency of flights increasing, including: • RWY05 departures (D17-D18), to 11 flights on average, up to a maximum of 25 flights, per night over Orchard Hills, St Marys and Penrith • RWY23 arrivals (A14-A17), to 24 flights on average, up to a maximum of 57 flights, per night over Orchard Hills, St Marys, Eastern Creek and suburban areas on the western outskirts of Blacktown. Overall, the effect of the project lighting would be experienced across a small portion of this urban area. The planes at night would not contrast substantially with the surrounding landscape at night, resulting in a low magnitude of change.
Visual impact	**Negligible**	

8.2.2 Areas of medium district brightness (A3) – Western Sydney

8.2.2.1 Existing conditions

Urban and semi-urban areas in the landscape and visual study area including rural residential areas near WSI such as Silverdale, Warragamba and Greendale. There are existing flights passing above these areas which would be generally at higher elevations and not strongly influence the character of views at night.

8.2.2.2 Visual impacts at night

The following table summarises the potential visual impacts of the project on areas of medium district brightness (A3) at night.

Table 8.22 Landscape impact – Areas of medium district brightness (A3)

	Impact level	Details
2022 baseline		
Sensitivity	Low	These areas generally include street lighting, lighting from vehicles, dwellings. These areas include general sky glow from concentrations of lighting within the urban areas.

	Impact level	Details
2033 scenario		
Sensitivity	Low	No change.
Magnitude of change	Moderate	Semi-rural and rural residential areas that would experience views to planes at low altitude (less than 5,000 ft) due to take off and landing include Mulgoa, Wallacia, Silverdale and Greendale. In the early evening, areas of medium district brightness (A3) would experience views to planes at low altitudes (less than 5,000 ft) including south of Silverdale which is overflown by arrival and departure flight paths on RWY05 (A1-A5) and RWY23 (D1-D6). At night, areas of medium district brightness (A3) would experience views to planes at low altitudes (less than 5,000 ft) including: • RWY05 arrivals (A10-A13) over areas south of Silverdale with 9 arrival flights on average, up to a maximum of 23 flights, per night • RWY05 departures (D20-D22), over Mulgoa and Wallacia, up to about 6 flights on average per night, up to a maximum of 14 flights, per night • RWY23 departures (D23-D27) with 9 flights on average, up to a maximum of 22 flights, per night. Overall, the lighting of the project would contrast with the surrounding landscape in areas south of Silverdale, across a moderate portion of the landscape, resulting in a moderate magnitude of change in areas south of Silverdale.
Visual impact	**Moderate-Low**	
2055 scenario		
Sensitivity	Low	No change.
Magnitude of change	Moderate	During the early evening, planes would follow the same paths and at the same altitude, with the frequency of flights increasing. At night, planes would follow the same paths and at the same altitude, with the frequency of flights increasing, including: • RWH05 arrivals (A10-13) to 27 flights on average, up to a maximum of 57 flights, per night • RWY23 departures (D23-D27) to 22 flights on average, up to a maximum of 57 flights, per night • RWY05 departures (D20-D22) to 13 flights on average, up to a maximum of 28 flights, per night. The increase in the frequency of flights would contrast with the surrounding landscape at night, however, there would continue to be a moderate magnitude of change in these areas.
Visual impact	**Moderate-Low**	

8.2.3 Areas of medium district brightness (A3) – The Blue Mountains

8.2.3.1 Existing conditions

Urban and semi-urban areas in the landscape and visual study area include towns along the Great Western Highway such as Woodford and Katoomba are of medium district brightness (A3). This area includes the Katoomba Falls Night-lit Walk, a 1.3 km walk offering night-time viewing of several natural features including Orphan Rock, Witches Leap, Katoomba Falls and Katoomba Cascades, as well as the Three Sisters which is also lit at night. The lit trail connects these lit areas and includes lighting from the top of the Katoomba Falls Kiosk car park, around Reid's Plateau and down to the Duke and Duchess lookout. This area also includes the Linden Observatory, an observatory and NSW State Heritage Registered place. This observatory is located on the northern outskirts of Linden (outside of the GBMA) and is currently used by amateur astronomy groups. There are existing flights passing above these areas which would be generally at higher elevations and not strongly influence the character of views at night.

8.2.3.2 Visual impacts at night

The following table summarises the potential visual impacts of the project on areas of medium district brightness (A3) at night.

Table 8.23 Landscape impact – Areas of medium district brightness (A3)

	Impact level	Details
2022 baseline		
Sensitivity	Low	These residential areas generally include street lighting, lighting from vehicles, dwellings. There is lighting associated with the night trails and lit features of the Katoomba Falls Night-lit Walk and around Echo Point and the Three Sisters. There would also be occasional night-time flight paths contributing to the light level.
2033 scenario		
Sensitivity	Low	No change.
Magnitude of change	Low	In the early evening, areas of medium district brightness (A3) would experience views to planes at higher altitudes (between 8,000–17,500 ft) including departure flight paths on RWY05 departures (D3) over Blackheath and RWY23 departures (D10) over Lawson. At night, areas of medium district brightness (A3) would experience views to planes at higher altitudes including: • RWY05 arrivals (A10) over Lawson, 3 flights on average, up to a maximum of 8 flights, per night • RWY23 departures (D23-D24) over Lawson, with 2 flights on average, up to a maximum of 6 flights, per night. There would be a low magnitude of change at night due to the low frequency in flights and high altitude of planes.
Visual impact	**Low**	

	Impact level	Details
2055 scenario		
Sensitivity	Low	No change.
Magnitude of change	Low	At night, areas of medium district brightness (A3) would experience views to planes at higher altitudes with flight frequencies increasing, including: • RWY05 arrivals (A10) to 6 flights on average, up to a maximum of 14 flights, per night • RWY23 departures (D23-D24) to 10 flights on average, up to a maximum of 25 flights, per night. While there would be a slight increase in flight frequency, there would continue to be a low magnitude of change at night due to the relatively high altitude of planes.
Visual impact	**Low**	

8.2.3.3 Visual impacts at night – Linden Observatory

The following table summarises the potential visual impacts of the project on the Linden Observatory at night.

Further assessment of the impacts to activities at this observatory has been completed since exhibition of the Draft EIS. Refer to Appendix A of the Submissions Report for further detail.

Table 8.24 Landscape impact – Linden Observatory

	Impact level	Details
2022 baseline		
Sensitivity	High	The Linden Observatory is a dark site currently used by the Western Sydney Amateur Astronomy Group and offers the members and the public to explore the night sky using their own telescopes. It is a State-heritage listed place.
2033 scenario		
Sensitivity	High	No change.
Magnitude of change	Low*	In the late evening, the Observatory may be overflown by RWY05 arrivals (A10) with 3 flights on average, up to a maximum of 8 flights, per night. Planes may also be viewed in the night sky to the east of the Observatory including RWY23 departures (D23-D24), with 6 flights on average, up to a maximum of 14 flights, per night. However, the planes along these flight paths are likely to be at relatively high altitudes of between 8,000–10,500 ft (2.4–3.2 km). Overall, the effect of the project lighting would be experienced across a small portion of the sky and seen as distant flashing lights at high altitudes. Any obstruction of astronomical observations should be brief and infrequent. Overall, there would be a low magnitude of change.
Visual impact	**Moderate-Low**	

	Impact level	Details
2055 scenario		
Sensitivity	High	No change.
Magnitude of change	Low*	There would be an increase in night flights arriving on RWY05 arrivals (A10) to 6 flights on average, up to a maximum of 14 flights, per night. RWY23 departures (D23-24) to the east of the Observatory will increase in frequency to 10 flights on average, up to a maximum of 25 flights, per night. Despite the increase in flights, the planes would appear as distant flashing lights at high altitudes. Any obstruction to astronomical observations would be brief and intermittent. Overall, there would be a low magnitude of change in the night sky.
Visual impact	**Moderate-Low**	

*Note, this is an assessment of night time visual amenity.

8.2.4 Intrinsically dark landscapes (A0)

8.2.4.1 Existing conditions

This landscape includes large areas of remote wilderness areas including parts of the GBMA and other protected areas such as the Burragorang State Conservation Area. The scenic and aesthetic values of these landscapes, as well as recreational activities are generally experienced during the day time, from lookouts, picnic areas and walking trails, and other recreational activities in the GBMA, such as canyoning and rock climbing. Apart from designated campgrounds, there would not be much activity in these areas at night.

There are currently planes passing over the GBMA at night that may be visible, however, they are generally flying at high altitudes and increase in frequency in locations such as on the approach to Katoomba. There are a number of campgrounds within this landscape, from which there may be views to the sky where planes can be seen or where planes using the preliminary flight paths may be seen. Noting that most of these campgrounds are enclosed by trees, so that only flights that pass directly overhead are likely to be visible, and these would only be seen when viewing the sky during activities which are otherwise not brightly lit. Campgrounds which are under the flight paths include Euroka campground south of Glenbrook, Katoomba River crossing campground in the Jamison Valley, Ingar and Murphys Glen campgrounds south of Woodford, and Burralow Creek campground in the Lower Grose Valley area west of Kurrajong.

8.2.4.2 Visual impacts at night

The following table summarises the potential visual impacts of the project on the Intrinsically dark landscapes (A0) at night.

Table 8.25 Landscape impact – Intrinsically dark landscapes (A0)

	Assessment level	Details
2022 baseline		
Sensitivity	Very high	The Blue Mountains area includes several National Parks including the Blue Mountains National Park and Nattai National Park, as well as many state and regional conservation areas. These intrinsically dark landscapes (A0) have a very high visual sensitivity at night as these are reserves, they generally do not contain light sources such as dwellings, with only lights from vehicles travelling along access roads, lighting from camp sites, and occasional night-time flights at relatively high altitudes, contributing to the light level.
2033 scenario		
Sensitivity	Very high	No change.
Magnitude of change	Negligible	Most of these campgrounds are enclosed by trees, so that only flights that pass directly overhead are likely to be visible, and these would only be seen when viewing the sky during activities which are otherwise not brightly lit. Therefore, from the campground locations under the flight paths, the planes may be viewed as a series of small moving lights in the sky, occasionally. There are several campgrounds that would be overflown, including Burra Korain campground, Katoomba River crossing campground, Burralow Creek campground, Ingar campground and Murphys Glen campground. Murphys Glen campground would have the greatest number of overflights and is in closer proximity to the Airport Site than the other campgrounds that are overflown. Murphys Glen campground is overflown in the early evening by RWY05 departures (D4-D6). At night, this campground would be overflown by RWY05 arrivals (A10) with 3 flights on average, up to a maximum of 8 flights, or RWY23 arrivals (A15) and departures (D23 and D24), with 6 flights on average, up to a maximum of 17 flights, at night. The planes along these flight paths are likely to be at higher altitudes of about 8,000–10,500 ft (2.4–3.2 km), reducing the size of the lights on passing planes. Due to the limited lighting on planes, altitude, and relatively low frequency of flights overhead there is unlikely to be any perceived change to the character of the night sky. While there are flight paths over the eastern parts of the intrinsically dark areas of the Blue Mountains where planes would be at lower altitudes due to the closer proximity to WSI (such as north eastern parts of Burragorang National Park near Silverdale Road, and the GBMA, west of Mulgoa), these areas do not have any designated camp sites and would not be experienced by many people at night time. Overall, the effect of the project lighting would be experienced across a small portion of the landscape by few people. There would be a negligible magnitude of change.
Visual impact	**Negligible**	

	Assessment level	Details
2055 scenario		
Sensitivity	Very high	
Magnitude of change	Negligible	There would be an increase in the frequency of early evening and night flights where they pass over the intrinsically dark landscapes. At night, the RWY05 arrivals (A10) would increase to 6 flights on average, up to a maximum of 14 flights, and the RWY23 arrivals (A15) and departures (D23, D24), would increase to 22 flights on average, up to a maximum of 53 flights, at night. The project lighting would continue to be experienced across a small portion of the landscape by few people, so that there would continue to be a negligible magnitude of change.
Visual impact	**Negligible**	

8.2.5 Summary of night time visual impacts

The following table summarises the night time impacts on the environmental zones (based on AS4282:2019) and Linden Observatory.

Table 8.26 Visual impact assessment summary table – night time

	2022 baseline	2033 scenario			2055 scenario		
	Sensitivity	Sensitivity	Magnitude	Visual impact	Sensitivity	Magnitude	Visual impact
Night time environmental zone/location							
High district brightness landscapes (A4)	VL	VL	L	N	VL	L	N
Medium district brightness landscapes (A3) – Western Sydney	L	L	M	**M-L**	L	M	**M-L**
Medium district brightness landscapes (A3) – Blue Mountains	L	L	L	**L**	L	L	**L**
Linden Observatory*	H	H	L	**M-L**	H	L	**M-L**
Intrinsically Dark landscapes (A0)	VH	VH	N	N	VH	N	N

Key: N = Negligible, VL = Very Low, L = Low, M-L = Moderate-Low, M = Moderate, H-M = High-Moderate, H = High, VH = Very High

Chapter 9 Impact on the GBMA landscape values

Table 9.1 Lists the landscape character related values of the GBMA landscape, and provides an assessment of the potential impact of the project against these values.

Table 9.1 Potential impact on the GBMA landscape values

Landscape related value	Potential impact
GBMA UNESCO listing	
Criterion (ix): *The Greater Blue Mountains include outstanding and representative examples in a relatively small area of the evolution and adaptation of the genus Eucalyptus and eucalypt-dominated vegetation on the Australian continent.*	No direct or indirect impact.
Criterion (x): *The site includes an outstanding diversity of habitats and plant communities that support its globally significant species and ecosystem diversity.*	No direct or indirect impact.
Greater Blue Mountains World Heritage Area Strategic Plan 2009	
Scenic and aesthetic values	
• Striking vertical cliffs and waterfalls, ridges and escarpments	Views to vertical cliffs and waterfalls, ridges and escarpments may include distant planes where they are overflown by air traffic.
• '*Extensive caves'* in the Jenolan Karst Conservation Reserve	No direct or indirect impact as views to caves do not rely on views of the sky.
• '*Spectacular complex of narrow sandstone canyons and pagoda rock formations'*	Planes would be at least 1.5 km (5,000 ft) above the Blue Mountains, in the vicinity of key views and would not obstruct views to the sandstone canyons and pagoda rock formations. There are currently planes visible intermittently over the Blue Mountains, however, there would be more frequent flights and flights seen in key viewpoints and campgrounds across the GBMA including in views from Echo Point, Rock Lookout, Cleary Memorial Lookout and Portal Lookout. Views to narrow sandstone canyons and pagoda rock formations, such as in views to the 'Three Sisters' lookout at Echo Point, Katoomba would include distant planes (and potentially their contrails) crossing views at a high altitude in the background. The scenic value of these views would be altered slightly reducing the visual amenity of these views. Due to the very high sensitivity of these views, a low magnitude of change would result in a high-moderate adverse visual impact. The assessment, provided in Section 8.1.2.1 of this technical paper identifies high-moderate adverse visual impacts on views from several lookouts including Echo Point Lookout and Walls Lookout, during the 2055 scenario. The Walls Lookout represents a number of lookouts in the Grose Valley, and there may be similar impacts on several lookouts in this area.

Landscape related value	Potential impact
Recreation and tourism values	
• Vantage points on ridges and escarpments, offering 'outstanding vistas, from uninterrupted views of forested wilderness covered by natural vegetation to the contrasts of steep forested slopes surrounding cleared valleys'	There are numerous vantage points on ridges and escarpments within the study area. While the line of sight between these vantage points to the forested wilderness would not be interrupted due to the height of the planes, there would be views where additional planes would be seen flying overhead and across these views. The planes would range in height and distance from these locations but would be at least 1.5 km (5,500 ft) high and therefore of a relatively small scale. There may be locations where multiple planes will be seen together, as the flight numbers increase over time, and where multiple flight paths intersect or overlap. Refer to assessment of viewpoints in Chapter 8.
• *'Historic lookouts and walking tracks along the central Blue Mountains ridgeline'*	There are numerous Historic lookouts and walking tracks along the central Blue Mountains ridgeline. This includes many lookouts between Wentworth Falls and Katoomba which are oriented to the south and towards the proposed WSI, including Echo Point Lookout, Wynnes Rocks Lookout, Walls Lookout (including the surrounding Victoria Falls, Mount Banks Picnic area and lookout, Anvil Rock Lookout and the Baltzer Lookout). Refer to assessment of viewpoints in Chapter 8.
• *'Canyoning, Bushwalking, rock climbing, nature observation, scenic driving and photography are popular activities'*	The visual amenity and wilderness experience of these recreational activities may be reduced by increased visual intrusion by plane movements. Noting, these planes would be at an altitude of over 1 km (5,000 ft), and the assumed typical planes (most frequently flown being the A320) would be of a small scale in the sky.
Wilderness values	
• *'Extensive natural areas'*	No direct or indirect impact.
• *'Opportunities for solitude and self-reliant recreation'*	No direct or indirect impact.
• *'Unroaded except for management trails and largely free of exotic species'.*	No direct or indirect impact.

It was determined that there were no direct or indirect impact on the wilderness values. This is because:

- the project during operation would not alter directly or otherwise the extensive natural areas of the Blue Mountains. There is no vegetation removal proposed, and the operation of aircraft above these areas would not indirectly result in any changes to the extensive natural areas that currently exist
- the project would not reduce the opportunity for solitude and self-reliant recreation as the preliminary flight paths operate at high levels above the wilderness areas
- the project does not involve any further road development nor have any potential to introduce exotic species to the area, as the flights would operate well above these wilderness areas.

Chapter 10 Cumulative impacts

Cumulative impacts are a result of incremental, sustained and combined effects of human action and natural variations over time and can be both positive and negative and the assessment provided considers potential impacts associated with the project in conjunction with other known and proposed developments.

Given the size of the study area and operational timeframes of the project, other relevant projects or developments considered likely to contribute to cumulative impacts have been restricted to those of sufficient scale to contribute materially to cumulative impacts at a regional level with similar or overlapping spatial or temporal characteristics. A list of major projects and strategic developments considered for cumulative impacts is provided in Chapter 22 of the EIS.

The following discussion identifies the potential for cumulative visual impacts generally, across Western Sydney and the Blue Mountains.

10.1 Western Sydney

Generally, the planned land use changes around the Airport Site have anticipated the potential for increased airspace activity, and consequently the landscape character and visual sensitivity is less in some areas in close proximity to the Airport Site. The assessment contained in this technical paper has anticipated these land use changes as the baseline for landscape character and views, and sensitivity of future potential receivers over the time horizons assessed.

10.1.1 Landscape character

There would be cumulative effects on several landscape character zones near the Airport Site, where there would be a greater concentration of flights and flights at lower altitudes. This includes the Penrith south-east rural transition Landscape Character Zone (LCZ2), Greendale and Silverdale rural and residential landscape (LCZ3), and Luddenham village and agricultural precinct (LCZ4), where the land use change together with increased airspace activity would transform the character of the landscape.

10.1.2 Views

Cumulative visual impacts are likely to occur where views are seen in proximity to current and future large-scale infrastructure projects and ongoing strategic growth centre development areas in Western Sydney. This changing visual setting has been considered in the visual impact assessment as a changing baseline condition. Noting, there would be a cumulative effect on views from Luddenham village, Silverdale and Orangeville to the west of the Airport Site, and Orchard Hills to the north, where the transformation of the landscape character of the land would be seen together with changes to the character of the sky due to increasing airspace activity.

There would also be a cumulative effect on views from recreational areas to the east of the Airport Site, including George Maunder Lookout, Prospect Reservoir, where there would potentially be views to the development in areas surrounding the reservoir and increasing flights in the airspace across this elevated view.

10.2 Blue Mountains

There are no land use changes or major projects identified within the Blue Mountains that would influence the landscape character or views. However, in relation to landscape character, there is the potential for increased air traffic across the Blue Mountains as a consequence of upgrades to airports and changes to the management of airspace above the Sydney basin and Blue Mountains.

10.2.1 Landscape character

There would be cumulative effects on the landscape character zones across the Blue Mountains are increasingly influenced by air traffic, both from WSI and other airports within the Sydney basin. The assessment of impacts, in this assessment, the baseline sensitivity has not changed.

These cumulative effects may occur where there are increased flights at other airports within the Sydney Basin flying over the Blue Mountains Landscape character zones (LCZ13 Blue Mountains iconic features, LCZ14 Blue Mountains forested hills and valleys and LCZ15 Blue Mountains township spine).

10.2.2 Views

There is the potential for a cumulative effect on views from lookouts (including Echo Point and Walls Lookout, for example) campgrounds and scenic routes throughout the Blue Mountains as flight frequency increases and flights related to other airports in the region have the potential to be seen in these views.

Chapter 11 Management and mitigation measures

11.1 Mitigation measures already incorporated into the project

The design of the flight paths aimed to minimise noise and other environmental impacts, including visual and social impacts, to the extent practical while still achieving safe and efficient operations. These considerations were had at various stages of the design process included sensitive tourist, recreational and wilderness areas.

In addition to airspace design constraints (such as technical and flight constraints (which includes safety) and other aircraft activity in the Sydney Basin), the airspace design considered the following areas as constraints:

- the GBMA
- residential built-up areas within the Sydney Basin and Blue Mountains region
- sensitive tourist and recreation areas with the potential to receive impacts from aircraft overflights including:
  - Jamison Valley south of Echo Point lookout and the Scenic Cableway at Katoomba and Wentworth Falls lookout
  - Grose Valley east of Evans lookout and Govetts Leap lookout
  - the wilderness area between Deanes lookout and Crawfords lookout within Wollemi National Park
  - the wilderness area between Mt Yengo lookout and Finchley lookout within Yengo National Park
  - Nattai wilderness area
  - Kanangra Walls and wilderness area east of Kanangra-Boyd lookout
  - Baal Bone Gap within Gardens of Stone National Park.

Many of these locations, are area of higher landscape character and visual sensitivity.

11.2 Additional proposed mitigation measures

The impact on views from lookouts within the Blue Mountains area, including Echo Point and lookouts along the Grose Valley should be managed, whereby if the visual impacts increase to a level whereby the increase beyond the minor magnitude of change, options for scheduling adjustments would be considered to minimise the impact on this nationally significant view corridor.

Chapter 12 References

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Appendix A

Photomontages, A3 plates


Western Sydney International Airport - Echo Point Lookout - Runway 05 - Existing
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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Western Sydney International Airport - Echo Point Lookout - Runway 05 - Proposed
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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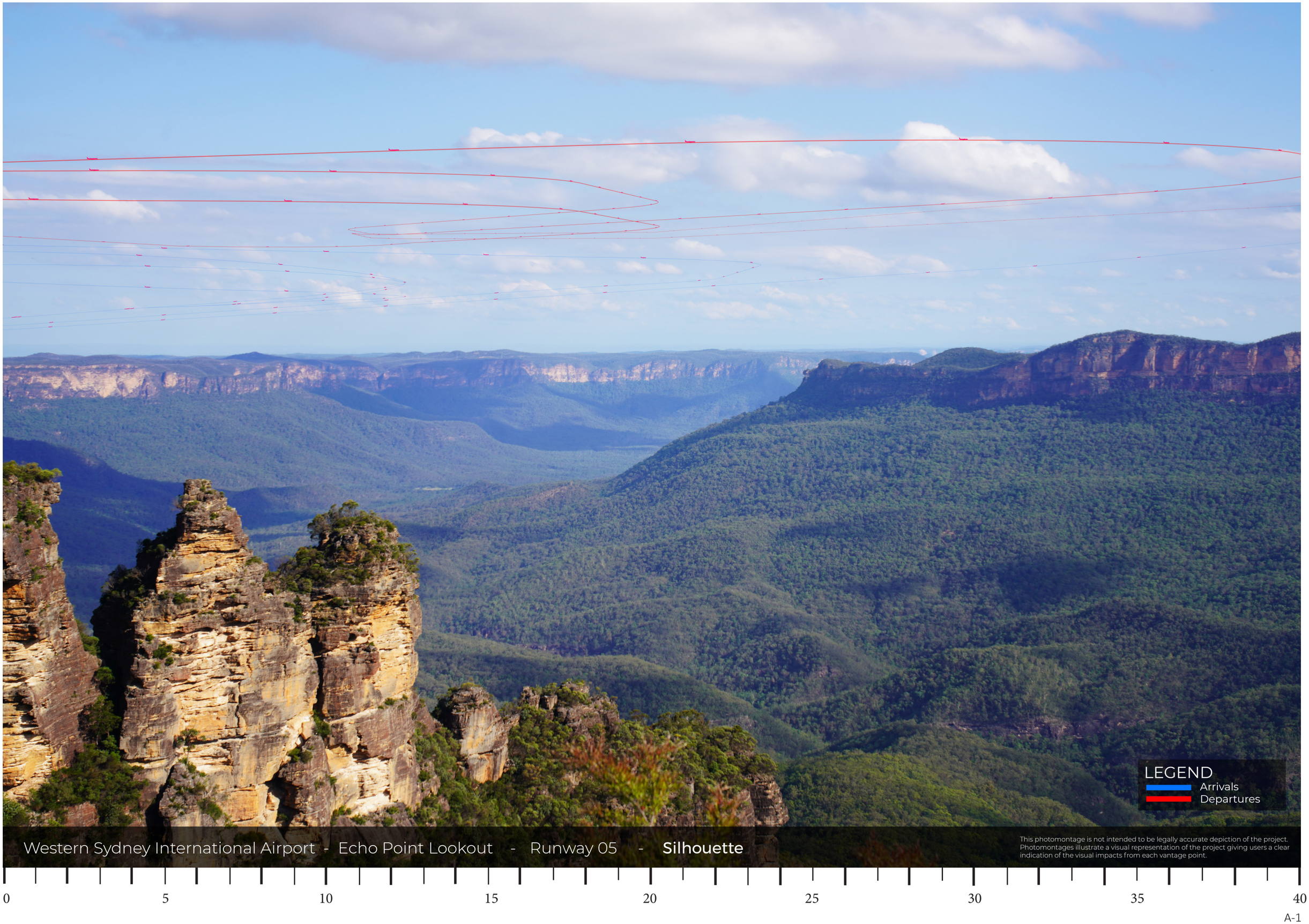
LEGEND
Arrivals
Departures
Western Sydney International Airport - Echo Point Lookout - Runway 05 - Silhouette
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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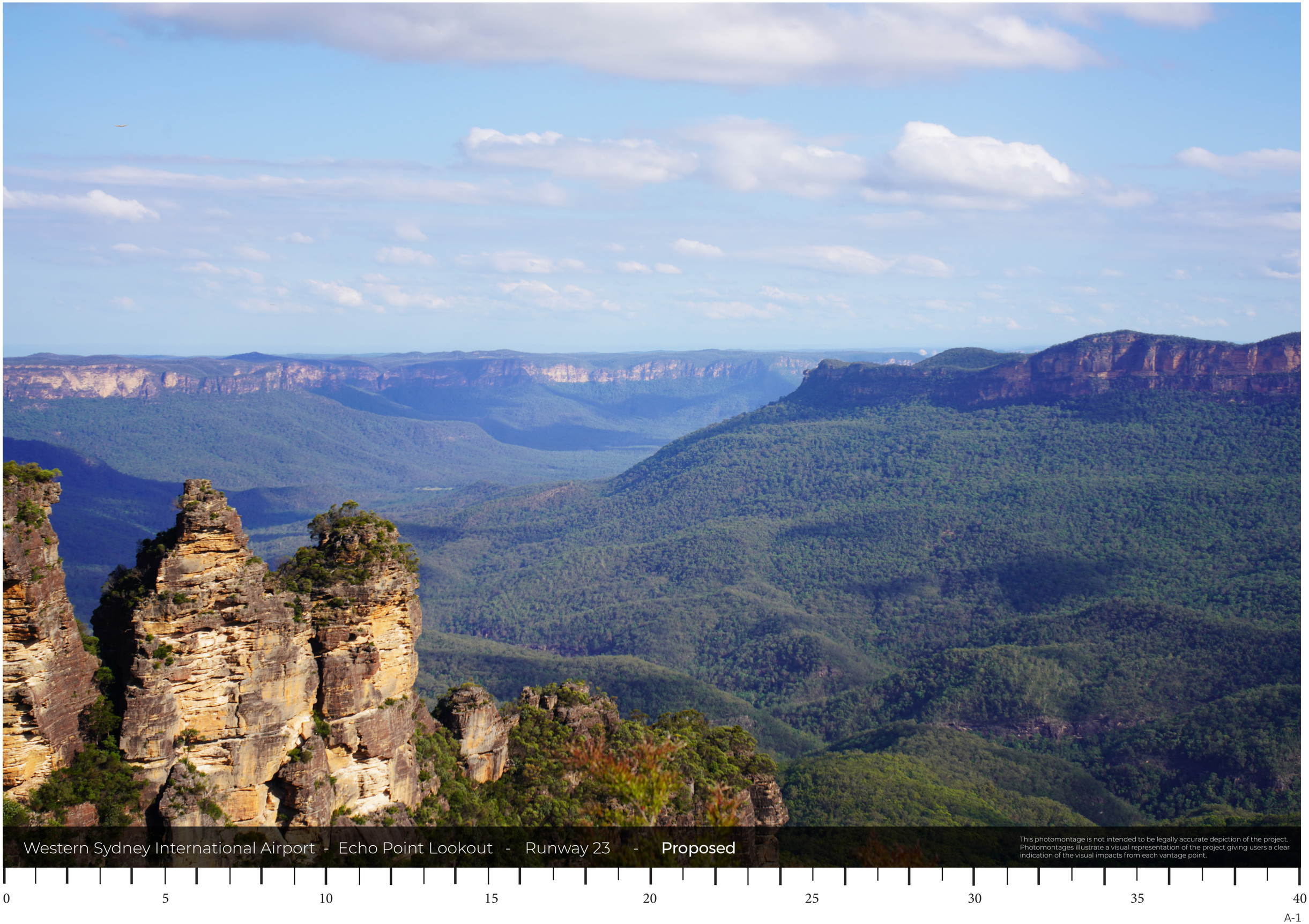
Western Sydney International Airport - Echo Point Lookout - Runway 23 - Proposed
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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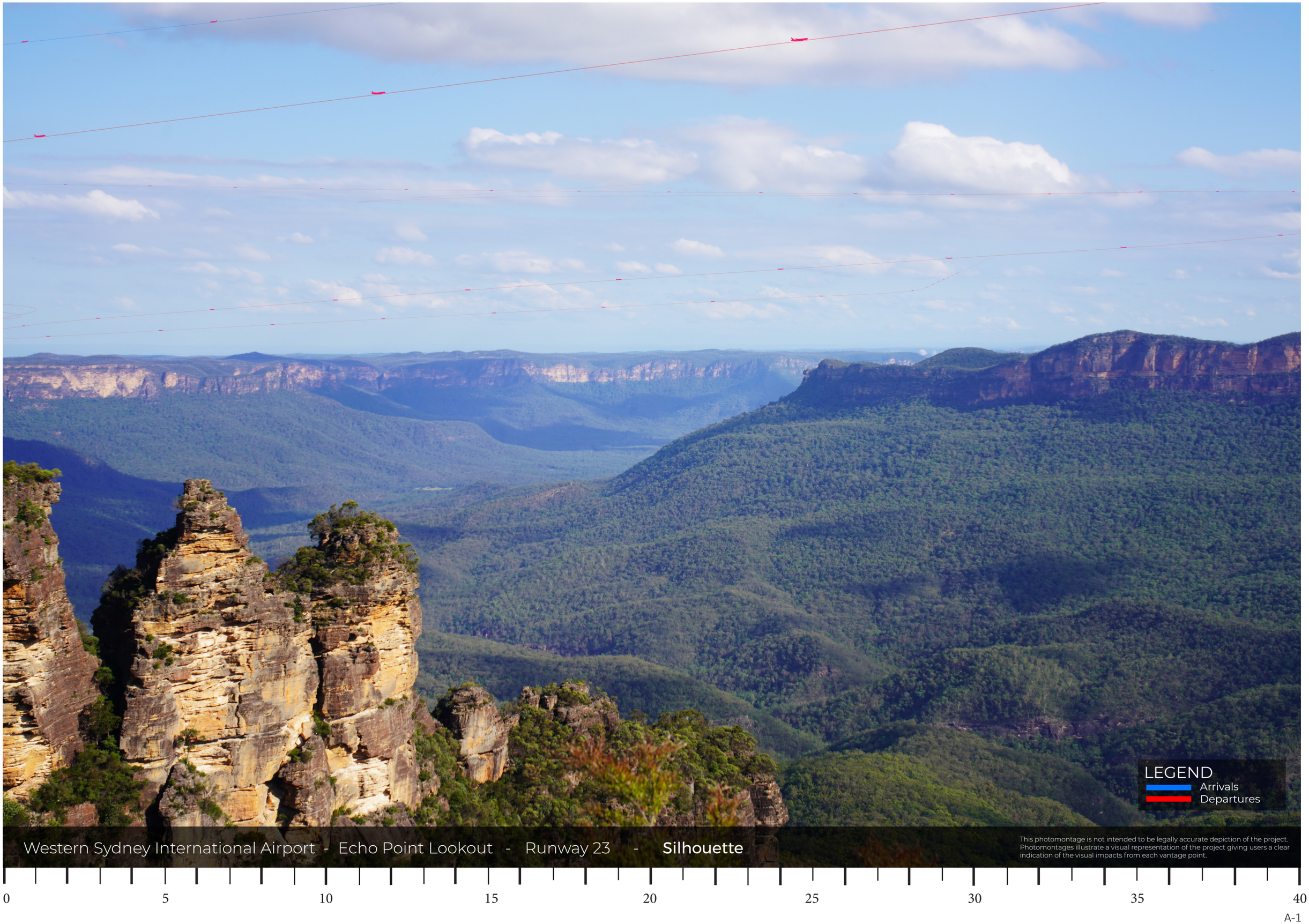

Western Sydney International Airport - Echo Point Lookout - Runway 23 - **Silhouette**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Silverdale Rd - Runway 05 - **Existing**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Silverdale Rd - Runway 05 - **Proposed**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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LEGEND
Arrivals
Departures

Western Sydney International Airport - Silverdale Rd - Runway 05 - **Silhouette**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Silverdale Rd - Runway 23 - **Proposed**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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LEGEND

Arrivals

Departures

Western Sydney International Airport - Silverdale Rd - Runway 23 - **Silhouette**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Prospect Reservoir - Runway 05 - Existing
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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Western Sydney International Airport - Prospect Reservoir - Runway 05 - Proposed
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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LEGEND
Arrivals
Departures
Western Sydney International Airport - Prospect Reservoir - Runway 05 - Silhouette
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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Western Sydney International Airport - Prospect Reservoir - Runway 23 - Proposed
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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LEGEND
Arrivals
Departures
Western Sydney International Airport - Prospect Reservoir - Runway 23 - Silhouette
This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.
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Western Sydney International Airport - Luddenham Village - Runway 05 - **Existing**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Luddenham Village - Runway 05 - **Proposed**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Luddenham Village - Runway 05 - **Silhouette**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Luddenham Village - Runway 23 - **Proposed**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Western Sydney International Airport - Luddenham Village - Runway 23 - **Silhouette**

This photomontage is not intended to be legally accurate depiction of the project. Photomontages illustrate a visual representation of the project giving users a clear indication of the visual impacts from each vantage point.

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Australian Government

Department of Infrastructure, Transport,
Regional Development, Communications and the Arts