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AVIATION CONSULTING

Aviation Safeguarding Assessment

135 Badgerys Creek Rd, Bradfield

1 October 2025

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Aviation Safeguarding Assessment: 135 Badgerys Creek Rd, Bradfield

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VERSION NO.	DATE	PREPARED BY	CHANGE DESCRIPTION
V1 DRAFT	21/10/2024	Amin Hamzavian	First draft for client review
V2 DRAFT	09/09/2925	Amin Hamzavian	Complete re-write following extended delay in the project and heights of buildings and cranes changing significantly
V1 FINAL	16/09/2025	Amin Hamzavian	Figure 2 (SEARs table) updated to include all feedback from relevant stakeholders
V2 FINAL	01/10/2025	Amin Hamzavian	Crane activity dates updated in Figure 9

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Executive Summary

Executive Summary

This Aviation Safeguarding Assessment has been prepared by Avlaw Consulting Pty Ltd (Avlaw) on behalf of Bradfield Corporation Pty Ltd (the Applicant). It is submitted to the Department of Planning, Housing and Infrastructure (DPHI) in support of a State Significant Development Application (SSDA) on land at 135 Badgerys Creek Rd, Bradfield (the site).

The scope of Avlaw's engagement has been defined by applicable guidelines contained in the National Airports Safeguarding Framework (NASF) and all associated aviation legislation and regulations, which by default addresses aviation-related site specific SEARs that reference the Western Parkland City SEPP and Airports Act 1996.

It is important for readers to note that this report focuses on assessing the impacts of the built and temporary structures at the site in accordance with applicable aviation legislation, regulations and guidelines. This means that activities and land uses which are considered ancillary to the development or outside the built structures are excluded from this assessment. Interested parties should refer to the report prepared by the nominated Ecologist which accompanies the SSDA, as it addresses wildlife hazards and associated management strategies related to the park and significant landscaped area.

The proposed construction at the site will consist of three stages of development, which will see multiple towers up to varying heights. Stage 1 development will reach a height of 121.21m AHD, Stage 2 development will reach a height of 118.24m AHD and finally, Stage 3 development will reach a height of 119.72m AHD, with ancillary features captured within these envelopes. A detailed Construction Management Plan (CMP) will be developed for each stage when detailed design has been finalised, however preliminary advice in relation the crane heights indicates that luffing jib cranes which will range in height from 185.04m AHD to 188.01m AHD.

Avlaw's assessment has concluded that the proposed built structures across the site will not intrude the prescribed airspace of Western Sydney (Nancy-Bird Walton) International Airport Corporation (WSI). All of the buildings will also be less than 100m AGL, and therefore not require controlled activity approval. Temporary intrusion by cranes into the WSI OLS will be required to construct the buildings at the site, however, with mitigations in the form of markings and lighting, Avlaw does not believe these proposed obstacles will adversely impact the safety, efficiency and regularity of aircraft operations and should therefore be approved. No other aviation compliance issues or hazards to aircraft operations have been identified by Avlaw. The rationale for reaching this conclusion is detailed throughout this report.

2

Introduction

Introduction

2.1 Site description

The site is located at 135 Badgerys Creek Road, Bradfield and is approximately 2.02ha in area. It is legally described as Lot 7 DP 243457 and is located approximately 250m to the future Bradfield Metro Station and 4km to the Western Sydney Airport. An aerial image of the site is provided below.

The site shares a western frontage with Badgerys Creek Road. The eastern boundary of the site adjoins the State government-led Bradfield City Centre which is set to be a vibrant 24/7 global city, driving advancements in industry and will support 10,000 more homes and 20,000 new jobs in Western Sydney.

As defined by the Aerotropolis Precinct Plan, the site is located within the Aerotropolis Core Precinct which is envisioned as an attractive place for workers, residents and visitors. The Aerotropolis Core Precinct will leverage the positive economic impact of the adjacent Western Sydney Airport and Bradfield City Centre. It will attract business hubs, research and development, professional services and creative industries in addition to providing residential development within walking distance of the Bradfield Metro station and proximity to blue and green infrastructure.

Figure 1: Site Aerial Map

Source: Nearmap / edited by Ethos Urban

2.2 Proposed development

The proposed development will seek consent for the redevelopment of the site, comprising:

- Enabling works including vegetation removal and earthworks;

- The construction of three buildings, comprising:
  - Residential use, including approximately 400 apartment units;
  - Hotel use, including approximately 450 hotel rooms;
  - Commercial use, including supermarket, food and drink and other commercial uses;
  - Medical centre use;
  - Childcare centre use;
- Construction of two basement structures, including approximately 800 carparking spaces;
- Public domain upgrades, including:
  - Construction of an internal road;
  - A public plaza;
- Rehabilitation and augmentation of the existing riparian corridor;
- Landscaping embellishments on the ground level and within the built form; and
- Services augmentation as required.

2.3 Secretary's Environmental Assessment Requirements

Refer to the Environmental Impact Statement for a detailed summary of the proposed development.

In accordance with section 4.39 of the Environmental Planning & Assessment Act 1979 (EP&A Act), Secretary's Environmental Assessment Requirements (SEARs) for SSD 77458970 were issued on 30 January 2025. This report has been prepared to respond to the relevant issued Secretary's Environmental Assessment Requirements (SEARS), as set out in the table below.

SEARs Request	Response / Location in report
Address the provisions in Section 4.22 Airspace Operations in the State Environmental Planning Policy (Precincts – Western Parkland City) 2021	Section 5.5
In accordance with Chapter 4 of the Western Parkland City SEPP and the Airports Act 1996 (Commonwealth) assess the proposal against airport safeguarding requirements	Sections 5.1-5.8
If the site contains or is adjacent to a HLS, assess the impacts of the development on that HLS	No HLS contained within the site Nearest HLS to the site identified and assessed in Section 5.7
If the development proposes a helicopter landing site (HLS), assess the potential impacts on the flight paths of any nearby airport, airfield or HLS	N/A

Address the requirements listed in SEARs advice Western Sydney Airport dated 7 January 2025, by Western Sydney Airport	Section 5.5 and Section 6
Address the requirements listed in SEARs advice Commonwealth Department of Infrastructure, Regional Development, Communications (Western Sydney Airport Regulatory Policy) and the Arts dated 10 January 2025, by Western Sydney Airport Regulatory Policy	Sections 5.1-5.8 and Section 6

Figure 2: Summary of aviation-related site-specific SEARs which are addressed in this report

3

Regulatory Framework

Regulatory Framework

3.1 Airspace Height Controls

Protection of airspace surrounding an airport is a critical component of maintaining requisite safety standards that facilitate the efficient use of runways, whilst also managing the associated impacts of their use on other critical infrastructure (e.g. taxiways), the environment and the general public. As a signatory to the *Chicago Convention 1944*, Australia adopts International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs) with respect to airspace which define sets of invisible surfaces above the ground around an airport. The airspace above these surfaces forms the airport's prescribed airspace.

With regards to WSI, at the time of writing, only the OLS has been "declared" by the Department and has therefore been enshrined in legislation as the airport's prescribed airspace. Once detailed airspace design is complete, other components of the airport's prescribed airspace including those related to Instrument Flight Procedures (IFP), also referred to as Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS) will be declared and then also form part of WSI's prescribed airspace. In the absence of the declared PANS-OPS for WSI, Avlaw has completed an assessment from first principles based on a series of assumptions, which are explained later in this report.

Development that infringes on an airport's prescribed airspace is called a "controlled activity" and can include, but is not limited to:

- permanent structures such as buildings intruding protected airspace;
- temporary structures such as cranes intruding protected airspace;
- or any activities causing intrusions into the protected airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter.

Of those listed above, only temporary structures are proposed to intrude the prescribed airspace of WSI.

3.2 Airspace Approval Process

Part 12 of the *Airports Act 1996* (Act) and the *Airports (Protection of Airspace) Regulations 1996* (Regulations) establish a framework for the protection of airspace at and around airports. The Act defines any activity resulting in an intrusion into an airport's prescribed airspace to be a "controlled activity" and requires that controlled activities cannot be carried out without approval.

With respect to WSI prior to the estimated opening in Q4 2026, there are exemptions in the Regulations if the planned activity in the airport's OLS involves buildings, structures or things that penetrate the protected airspace but are:

- no taller than 10 metres above ground level;
- relates to temporary activities that penetrate the protected airspace, but do not continue for more than 12 months and will not result in a permanent airspace intrusion;
- or is authorised by the WSI, Airport Plan, herein referred to as the "Airport Plan".

Regulation 16A (3)(e) Exemption relating to "temporary buildings etc" that would include cranes, references the activity not being carried out after 31 December 2025. However, this exemption cannot be sought as construction of Stage 1 is expected to commence in September 2027.

3.3 Other Aviation Approval Requirements

In addition to the controlled activity approval process detailed above at 3.2, there are a range of other aviation regulations, legislation and standards that proposed construction activities need to be assessed against to determine the extent to which they may impact the safety, regularity or efficiency of aircraft operations before they are permitted to commence. Although the administrative processes which relate to these other requirements are not captured within that described at 3.2 above, the same stakeholders are involved in the assessment processes against each of these other requirements:

- The airport operator closest to the site, in this case WSI:
- CASA;
- Airservices Australia; and
- The Department.

Depending on the outcomes of each of these stakeholders' assessments, various conditions may be attached to consents to construction or where an assessment is not favourable, a rejection or change to the proposed development may be stipulated. In the context of the proposed development at the site, any conditions which are expected to be associated with any approvals that are issued to Bradfield are explained in Section 6.

4

Proposed Development

Proposed Development

4.1 Site description

The figure immediately below shows the entire site boundary, followed by additional plans which indicate the land which forms each respective stage of the development.

Figure 3: Satellite imagery showing boundary of the site

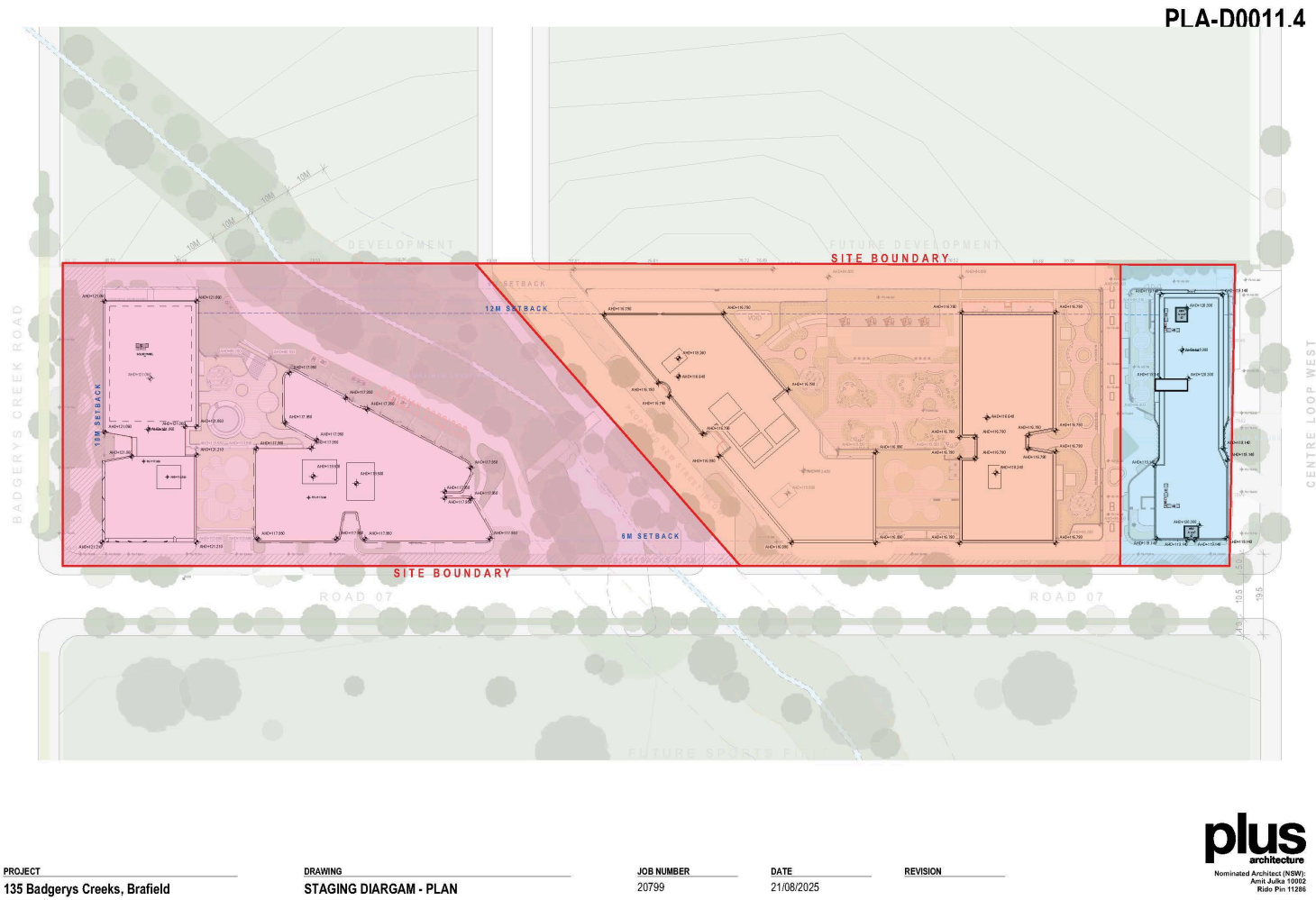


Figure 4: Site plan indicating the land which forms each respective stage of development at the site

Note: Stage 1 = blue (right), Stage 2 = orange (centre), Stage 3 = red (left)

4.2 Location

The nearest edge of the site is approximately 2,760m SE of the end of runway 05R/2L which is illustrated in Figure 5 below. This runway will not be operational when WSI opens in 2026 and is expected to come into use as when the first runway reaches its capacity, with current projections estimated this to be in the 2050's.

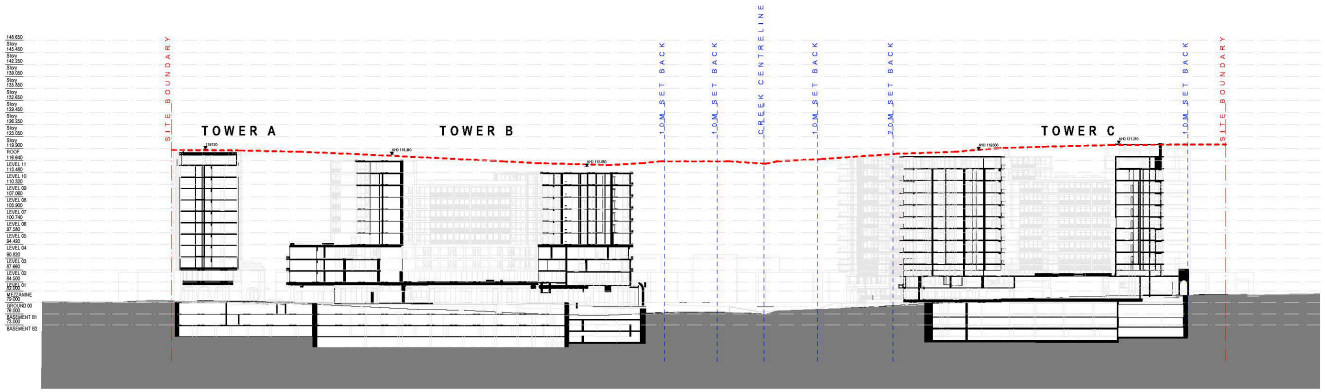
Figure 5: Site (red) in relation to both runways at WSI

4.3 Permanent structures

The built structures proposed across the site will see a series of towers reaching varying heights, the highest of which will be during Stage 1 and reaching a height of 121.21m AHD, with all ancillary features captured within this envelope.

The image below shows an elevation image of the buildings proposed across all three stages.

SITE SECTION DIAGRAM



44-55 and 135 Badgerys Creek Road Bradfield NSW **NO:20799** **DATE: 25/08/20**

plus architecture
Nominated Architect (NSW):
Amit Jukka 10002
Rido Pin 11286

Figure 6: Stage 1 development = Tower C (right), Stage 2 development = Tower B (centre) and Stage 3 development = Tower A (left)

4.4 Crane Activity

A detailed CMP which includes frozen crane heights, locations and specific dates of erection is not available at the time of writing. However, for the purposes of this assessment, Avlaw has been provided indicative information which assumes the use of luffing jib cranes across all stages of development.

One luffing jib crane will be installed per stage of development and based on the minimum radii of each, will reach heights ranging between 185.04m AHD to 188.01m AHD. A conservative approach has been adopted with regards to crane heights to inform the assessment in this report, which will be confirmed once a contractor is engaged and detailed design for stage of development is completed.

The figures on the following pages illustrate the vertical clearance above the built form of each stage of development, as well as the indicative locations and maximum swing arcs of each crane.

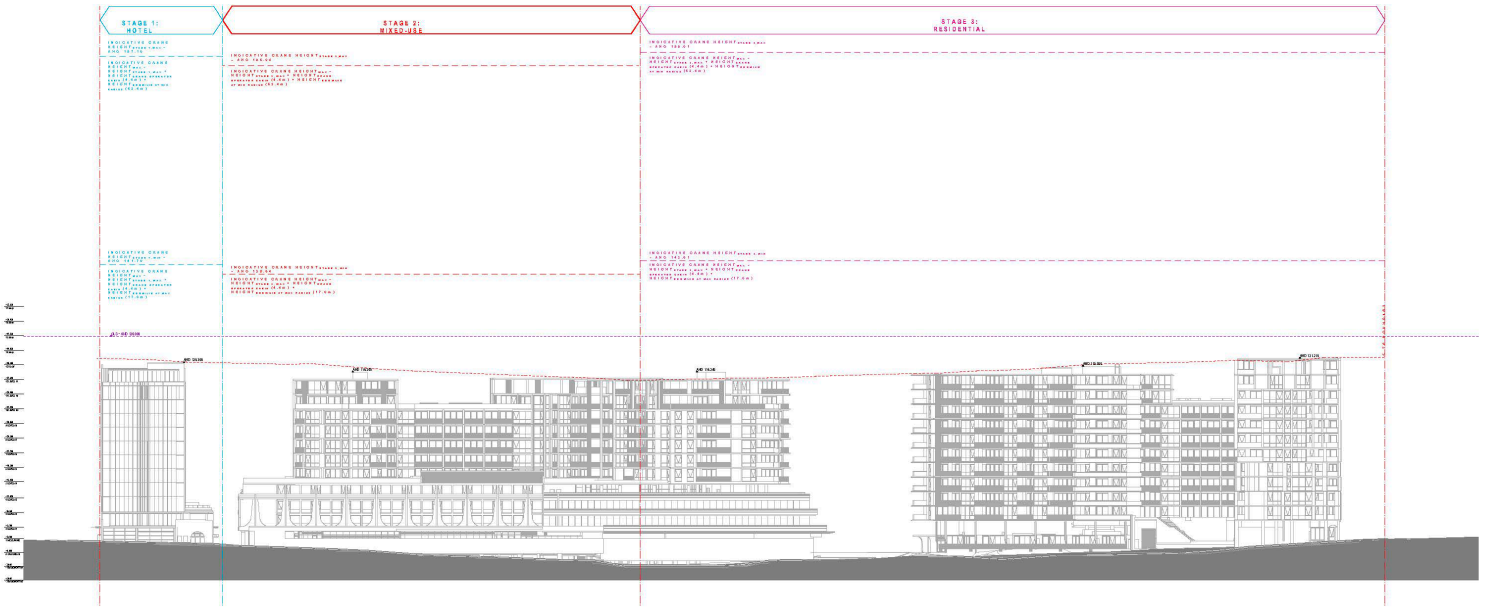


Figure 7: Elevation showing built structures and indicative clearances for cranes above each throughout construction

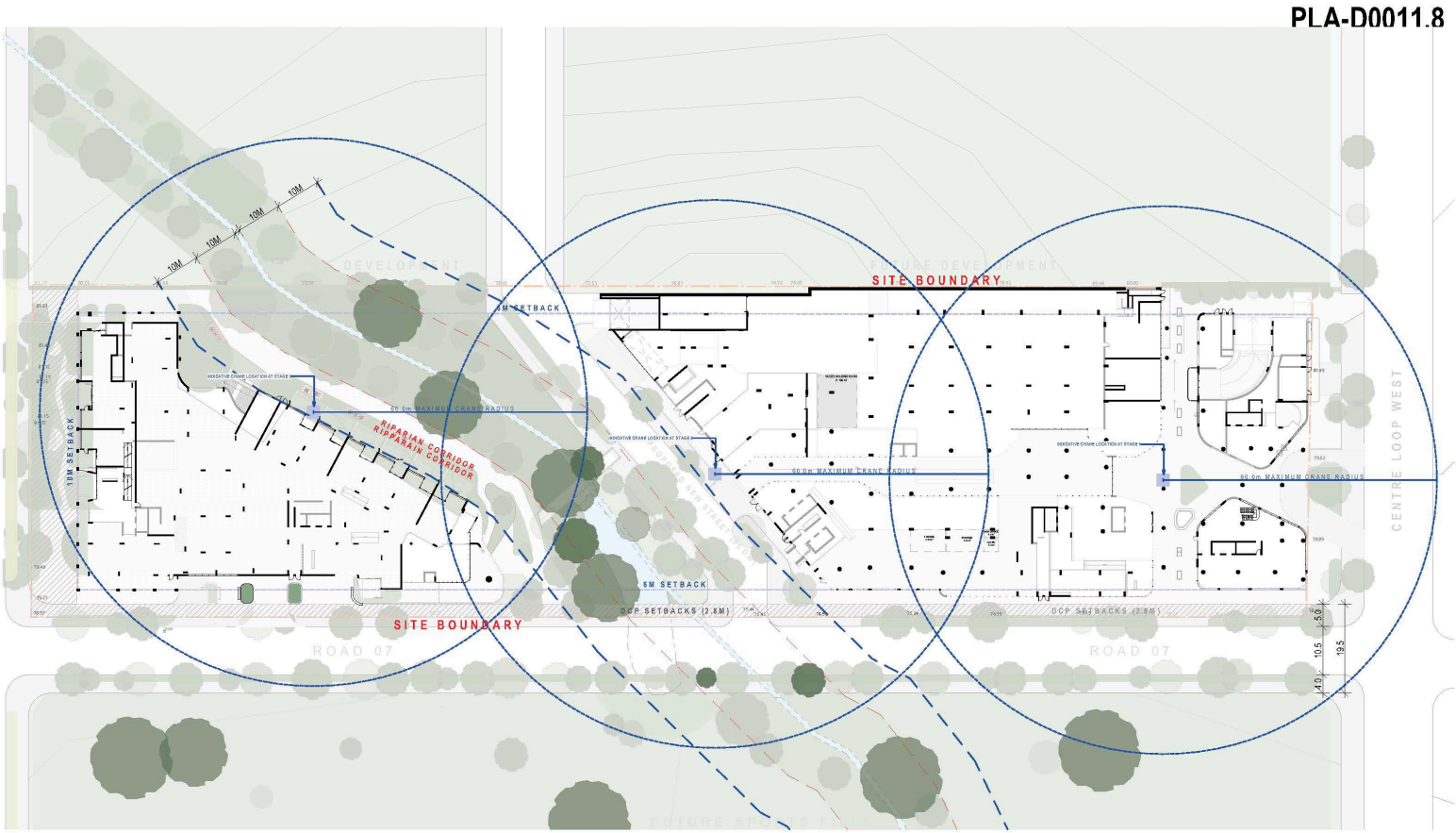


Figure 8: Plan view showing maximum swing arc of each crane proposed to be installed at the site

Note: Far right = Stage 1, centre = Stage 2, far left = Stage 3

The table below summarises the approximate dates which each crane will be erected, when they will intrude WSI's prescribed airspace (i.e. OLS), as well as when they will be removed/dismantled.

Summary of crane activity periods			
Stage	Date of erection	Date crane will penetrate OLS	Date of dismantling
1 - Hotel	December 2027	December 2027	June 2029
2 – Mixed Use	January 2029	January 2029	July 2030
3 - Residential	February 2030	February 2030	August 2032

Figure 9: Summary of indicative dates relating to cranes at the site during various stages of the development

These dates are indicative only and will be reviewed closer to construction commencing. In the event changes to dates on controlled activity approvals are required, these will be communicated with WSI and the Department so that updated approvals can be issued.

5

NASF Guidelines

NASF Guidelines

The proposed development at the site needs to be assessed against a range of guidelines and principles contained within the NASF to satisfy the expectations of local planning authorities and aviation stakeholders. This ensures that any unacceptable risks associated with property development in the context of aircraft operations are not approved unless important aviation stakeholders have had an opportunity to assess the proposed activities on various aspects of aviation safety and if necessary, propose appropriate mitigations that will ensure the safety, efficiency and regularity of aircraft operations is preserved.

All the NASF Guidelines are assessed in this section of this report, with the exception of an assessment of the Proposal against Guideline D of the NASF. This has been omitted as it relates specifically to wind turbine farms, which is irrelevant in given the type of development being proposed.

5.1 Aircraft Noise

The operation of WSI will result in significant changes in the pattern and exposure of aircraft noise in Sydney. To help quantify this and establish parameters around appropriate land-use planning based on noise, an Australian Noise Exposure Forecast (ANEF) will be prepared during the detailed airspace design phase that would be based on modelling of long-term parallel runway operations. This will be reflected in the form of an ANEF chart endorsed by Airservices Australia.

In the interim whilst that is being prepared, the development at the site and the lots has been assessed against an Australian Noise Exposure Concept (ANEC) chart that is available in the Airport Plan as well as in a WSI Fact Sheet (March 2023) on this aspect of land-use planning. The versions contained in those documents however are either low-resolution or do not provide sufficient detail on the satellite imagery to accurately plot the site. The NSW Government, Planning Industry & Environment ANEC Map though can be clearly interpreted and is inserted on the following page.

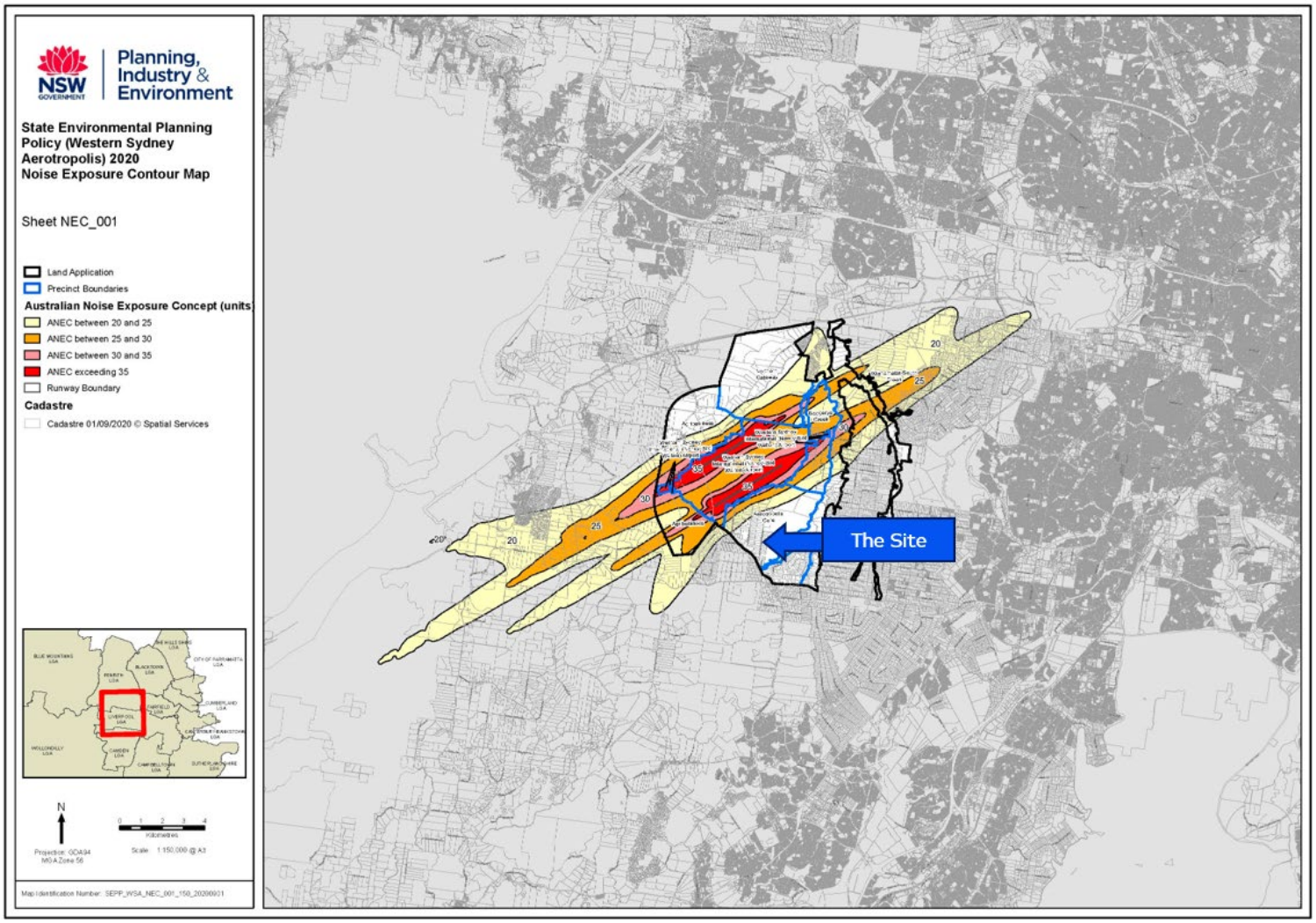


Figure 10: SEPP (WSI Aerotropolis) 2020 Noise Exposure Contour Map

It is clear that the entire site falls outside the contours within which restrictions for development of specific land uses would apply. Therefore, Avlaw's assessment is that the development at the site is compliant with noise restrictions as they relate to WSI.

5.2 Windshear and Turbulence

The Department has published Guideline B to provide advice to States and Territories as well as local government decision makers and airport operators to manage the risk of building generated windshear and building generated turbulence at airports. The assessment area which triggers additional assessment is illustrated in the figures below.

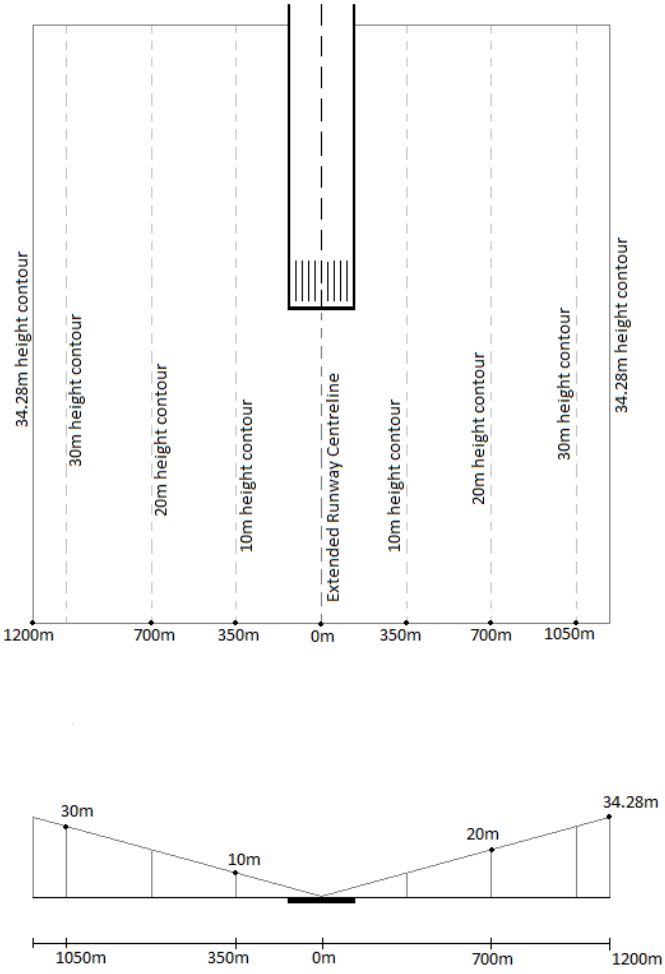


Figure 11: Plan view (top) and elevation view (bottom) of the 1:35 surface

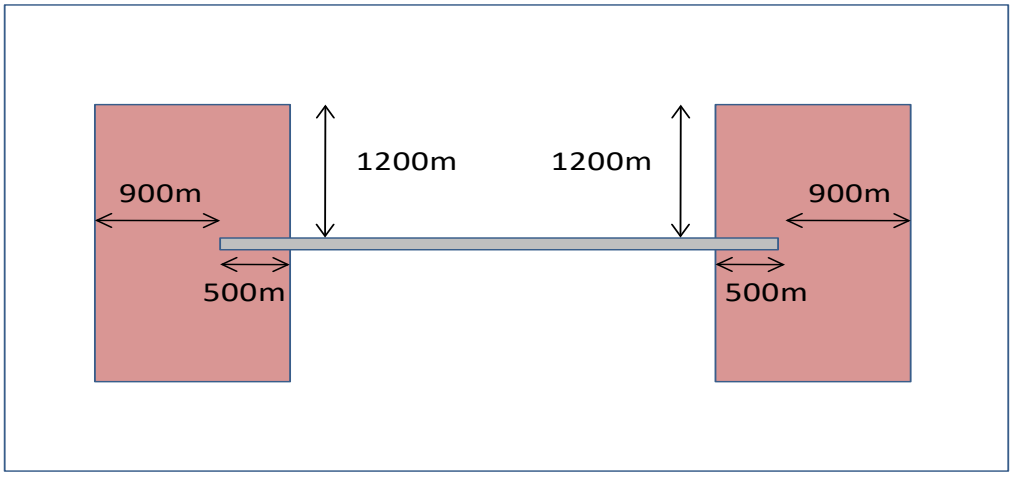


Figure 12: Area within which buildings that penetrate the 1:35 surface should be assessed

Since the closest edge of the site is approximately 2,760m from the nearest runway at WSI, the proposed development at the site does not need to be assessed further to ensure compliance with windshear and turbulence criteria.

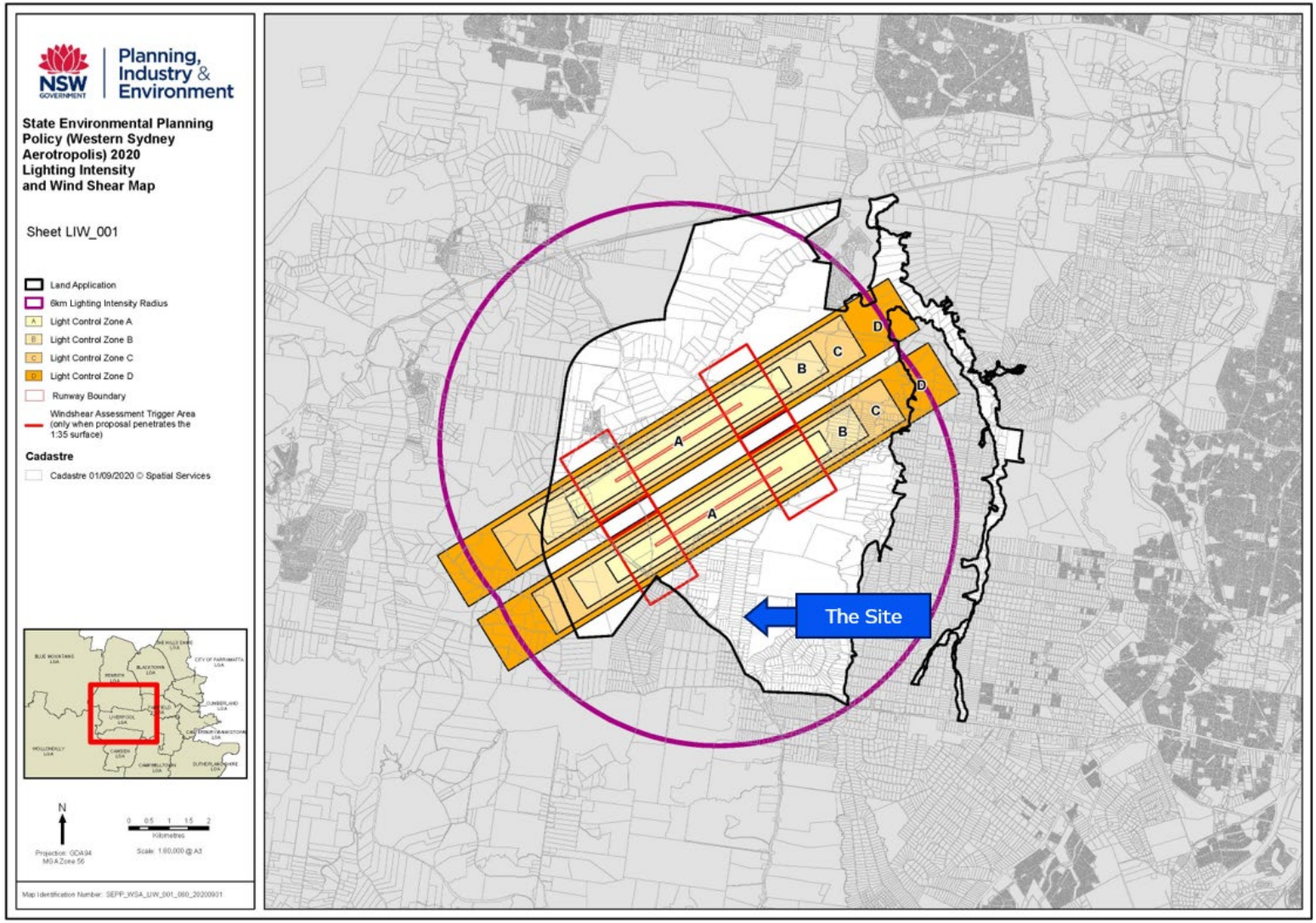


Figure 13: SEPP Lighting Intensity and Wind Shear Map

5.3 Wildlife Hazards

Within a certain proximity to an airport, aviation stakeholders require an assessment to be conducted on proposed developments to identify the risks of wildlife that may be present or attracted to a location as a means of understanding the impacts of said development on airport operations. Once identified, certain land uses are either deemed to be acceptable, unacceptable or conditionally approved based on specific monitoring and mitigation measures being developed and implemented.

The map on the following page has been sourced from the SEPP and reflects the wildlife buffers described in the NASF, whilst the table inserted on the following page specifies the risk rating associated with each land use type by proximity to WSI.

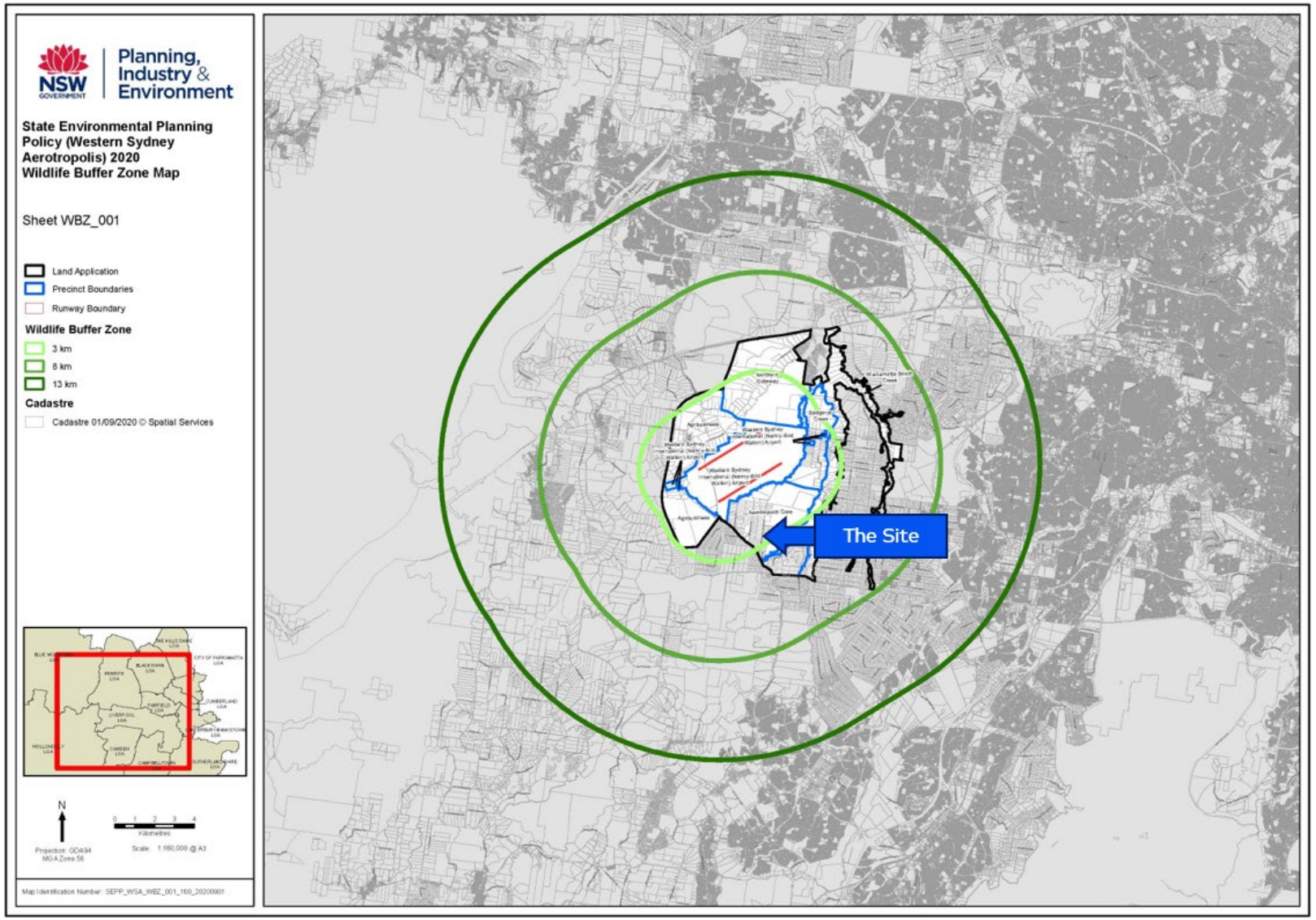


Figure 14: SEPP Wildlife Buffer Zone Map with the site and Lot C completely within the 3km wildlife buffer zone (lightest shade of green)

Wildlife Hazard Management Action Table **Attachment 1**

Land use types	Likely attractants ▲ natural elements ■ structural elements ● waste and food	Wildlife attraction risk	Actions for existing development and land uses in wildlife management areas			Actions for new and changed development and land uses in wildlife management areas		
			0-3 km (Area A)	3-8 km (Area B)	8-13 km (Area C)	0-3 km (Area A)	3-8 km (Area B)	8-13 km (Area C)
Agriculture								
Turf farm, piggery, abattoir, aquaculture	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fruit tree farm/orchard	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fish processing/packing plant	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Farm (cattle, dairy, poultry, crops)	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Horticulture, viticulture, market farms/gardens	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Forestry	▲ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Plant nursery	▲ ■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Conservation								
Wildlife/conservation area - wetland, waterways	▲	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Wildlife/conservation area - dryland	▲	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Recreation								
Significant open water (ancillary to development)	▲	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Showground	▲ ■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Significant landscaped space (ancillary to development)	▲	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Golf course	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Park, playground	▲ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Picnic areas, camping ground	▲ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Racetrack, horse riding school	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sports facility (tennis, bowls, football fields)	▲ ■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Commercial								
Food processing or storage facility	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fast food, drive-in, outdoor restaurant	■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Warehouse (food storage)	■ ●	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Car park	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel/motel	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Office building	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	■ ●	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities								
Food / organic waste facility	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	■ ●	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Water infrastructure (drains, channels, basins)	▲	High	Mitigate	Mitigate	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - landfill	●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	■ ●	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	▲ ■	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

Figure 15: NASF Guideline C Attachment 1 - risk ratings by land use type and proximity to WSI

Note: purple cells indicate those within the scope of Avlaw's assessment whilst the light blue are addressed by the ecologist

Avlaw acknowledges that ancillary land uses including significant landscape space, parks and car parks form part of the proposed development at the site. However, Avlaw's assessment in this document is limited to assessing compliance of activities within the built structures across the site (i.e. those highlighted purple in the table above). For more detailed mitigation strategies associated with those land uses indicated in light blue, please refer to the report prepared by the ecologist.

The entire site falls within the 3km wildlife buffer zone applicable to WSI. Within the 3km wildlife buffer zone, a new development which meets the land use definitions for a fast-food restaurant, shopping centre, hotel or office building results in a requirement to "Monitor" wildlife hazards and attractions, with particular emphasis placed on structural elements along with waste/food as major attractants/hazards.

It is important to note that while certain land uses pose a potential risk with respect to wildlife hazards, the table on the previous page is designed to be a tool for risk mitigation and not a complete ban on all development activities. Therefore, provided it can be shown that there is an acceptable level of risk from an aviation safety perspective, a development application may be approved following consultation with aviation stakeholders.

The responsibilities that are associated with monitoring potential attractions of wildlife are determined on a case-by-case basis between the Proponent and the airport operator. Some examples of what this may entail include the following, which have been taken from Guideline C:

- Regular monitoring surveys;
- Wildlife hazard assessments by qualified ornithologists;
- Wildlife awareness and management training for relevant staff;
- Establishment of bird population triggers;
- Implementation of activities to reduce hazardous bird populations; or
- Adoption of wildlife deterrent technologies to reduce hazardous bird populations

Point 22 in Guideline C of the NASF recommends that airport operators should negotiate with land use planning authorities and landowners to agree on action plans for monitoring and, where necessary, reducing wildlife attractions in the vicinity of airports. These processes will be ongoing to ensure the safe movement of aircraft. For the reasons mentioned earlier with respect to ancillary land uses being addressed by the ecologist, a range of mitigation strategies will need to be developed to ensure that risks are managed to As Low As Reasonably Practicable (ALARP).

5.4 Lighting

The Department has published NASF Guideline E on Managing Risk of Distractions to Pilots from Lighting in the Vicinity of Airports. The guideline advises on situations where lights are to be installed within a radius of 6km from an airport.

Attachment 1 to the guideline illustrates what is referred to as a "primary area" which is further divided into four segments which is illustrated below. The various lighting zones are also overlaid onto satellite imagery and can be found in the SEPP which is also shown on the following page.

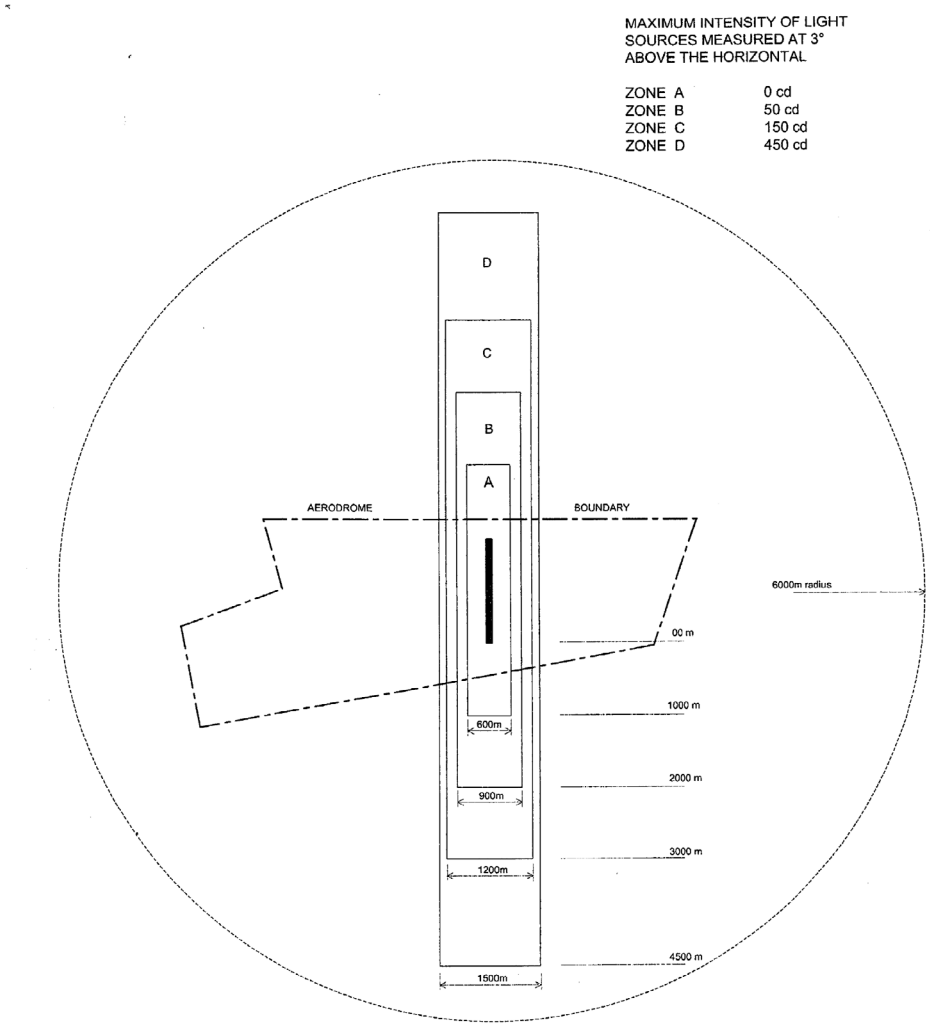


Figure 16: NASF lighting zones

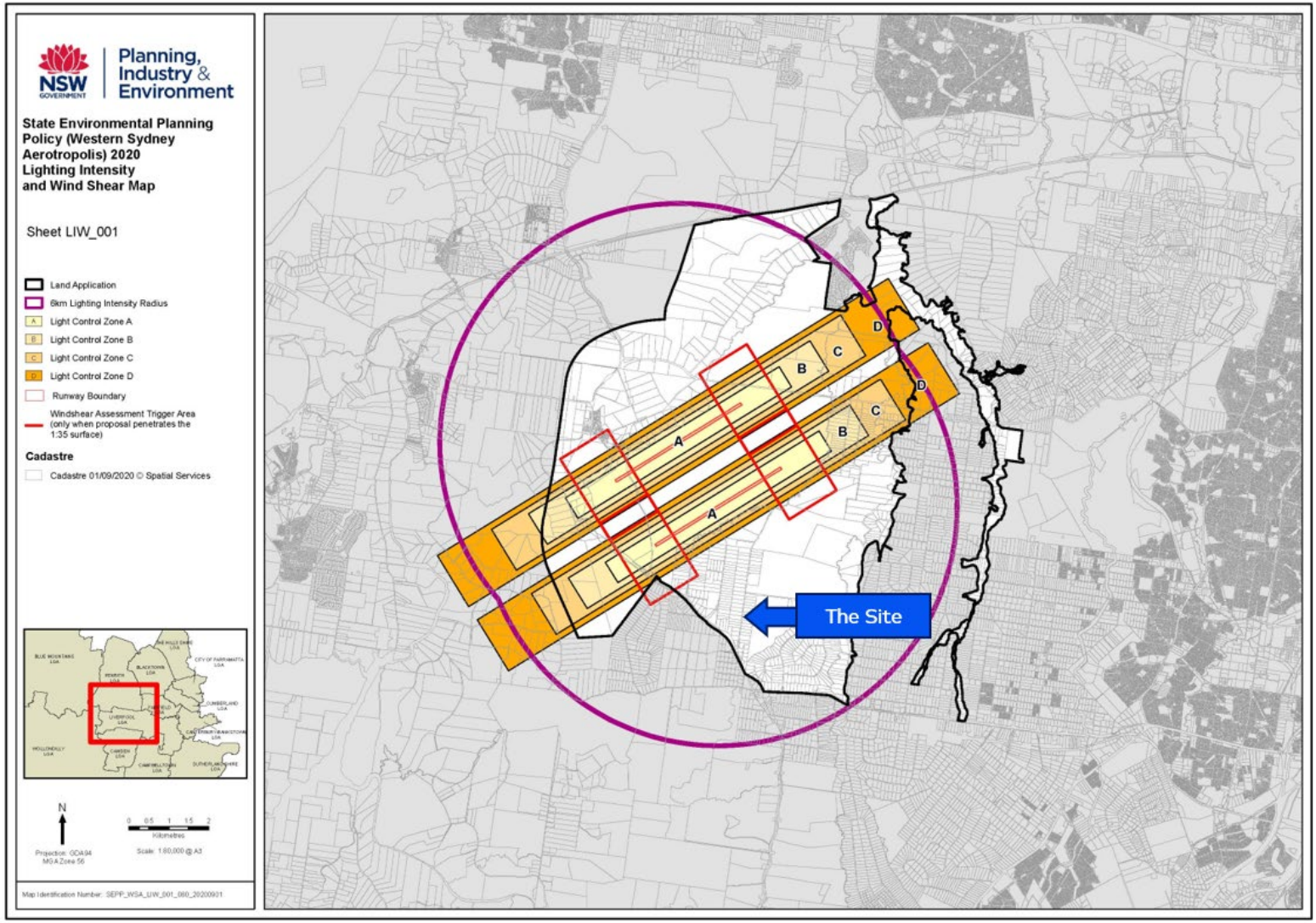


Figure 17: SEPP Lighting Intensity and Wind Shear Map

As is shown above, the entire sites falls outside the primary area indicated by Zones A, B , C and D for WSI. They do however both fall entirely within the 6km radius, within which lighting will need to be assessed by CASA to ensure no distractions to pilots or other hazards to aircraft operations are introduced.

It is important to note that the above limitations on maximum lighting intensity also apply to construction lighting. This should be taken into account when developing a CMP to ensure that unacceptable hazards to the safety of aircraft operations are not introduced.

5.5 Protected Airspace

The airspace design process for any airport is a highly technical and lengthy process. This is especially true with a new international airport like WSI, which must be carefully considered before construction of any nearby buildings commences. At the time of writing, only the OLS for WSI has been "declared" as prescribed airspace by the Department, meaning other key components of WSI's airspace such as the PANS-OPS and Radar Terrain Clearance Chart (RTCC) are not available publicly for review at time of writing.

In any case, Avlaw has completed a thorough prescribed airspace assessment which is based on modelling from first principles as well as a series of conservative assumptions which are inferred from what is known about the operations at the airport and ICAO standards, the findings for which are explained below. It is important to note that Avlaw's assessment is based on a two-runway operation, with reference to single runway operations (nominally 2026-2050) made where relevant.

OLS

The site is covered by the Inner Horizontal Surface of the OLS which is common to both runways at WSI. The figures on the following pages include an extract from the WSI OLS chart as well as the results of Avlaw's own modelling.

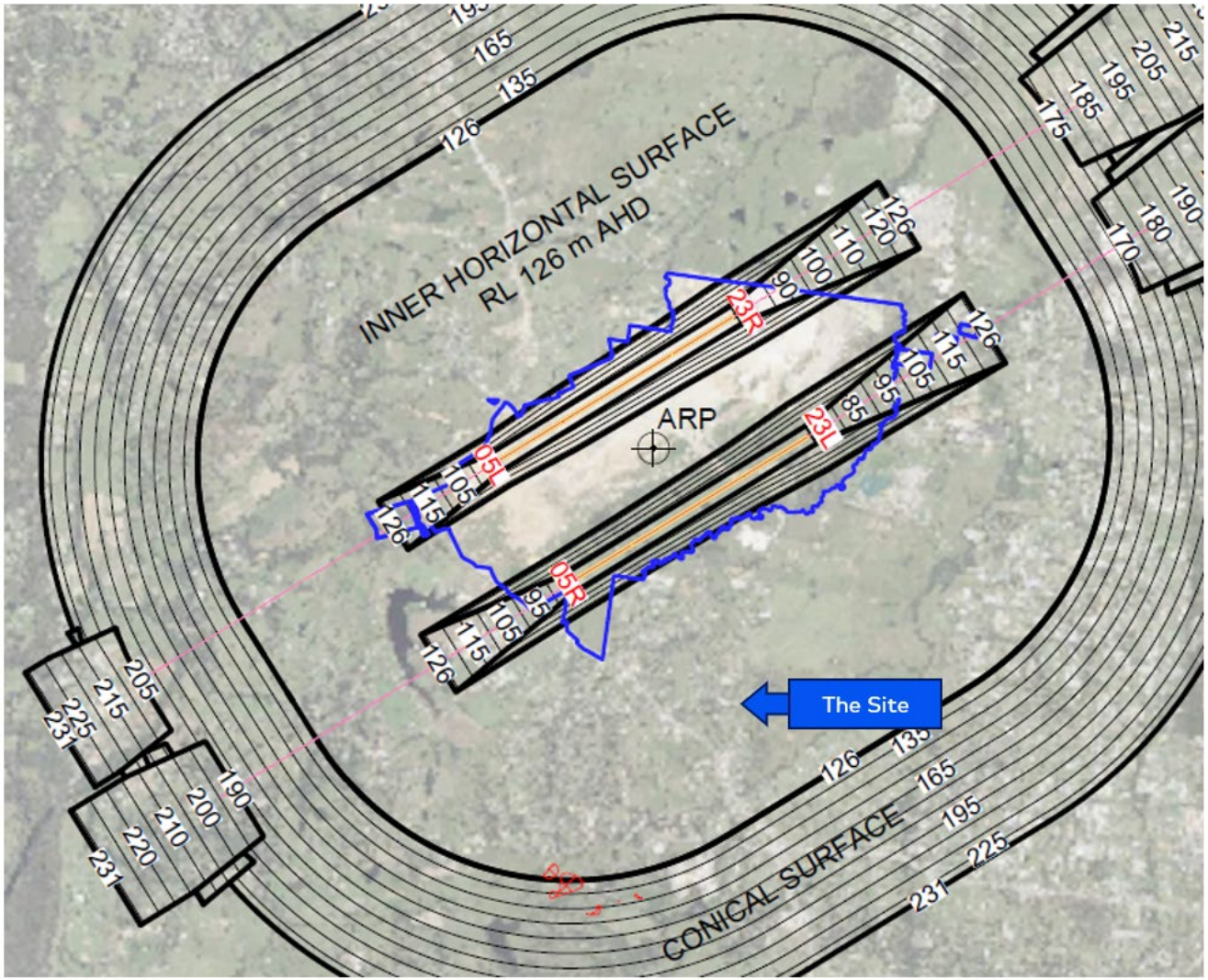


Figure 18: Extract from the WSI OLS chart

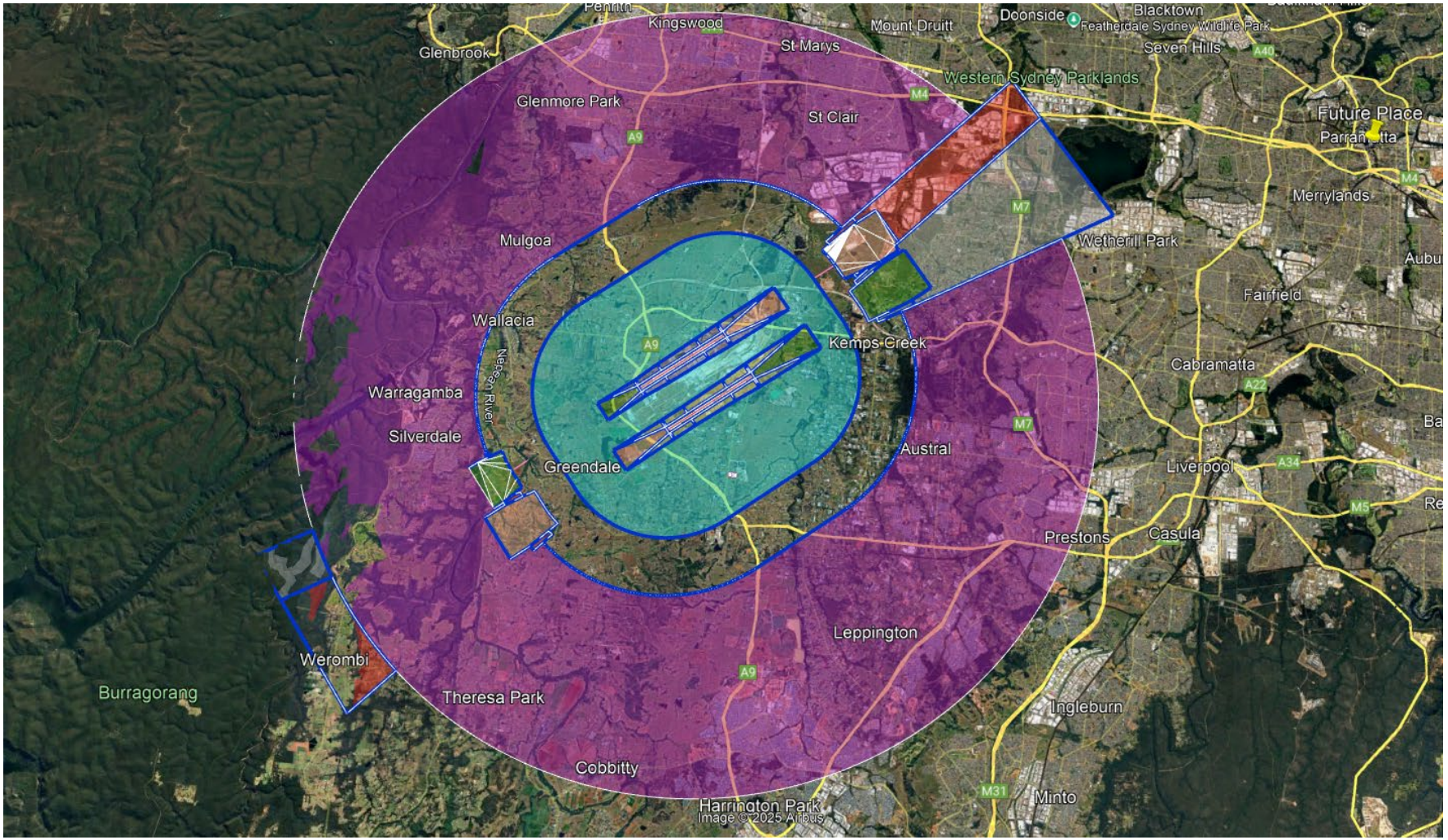


Figure 19: Avlaw model of the WSI OLS (two-runway operations)

Note: elevation of OLS over the site is 126.0m AHD i.e. building do not intrude

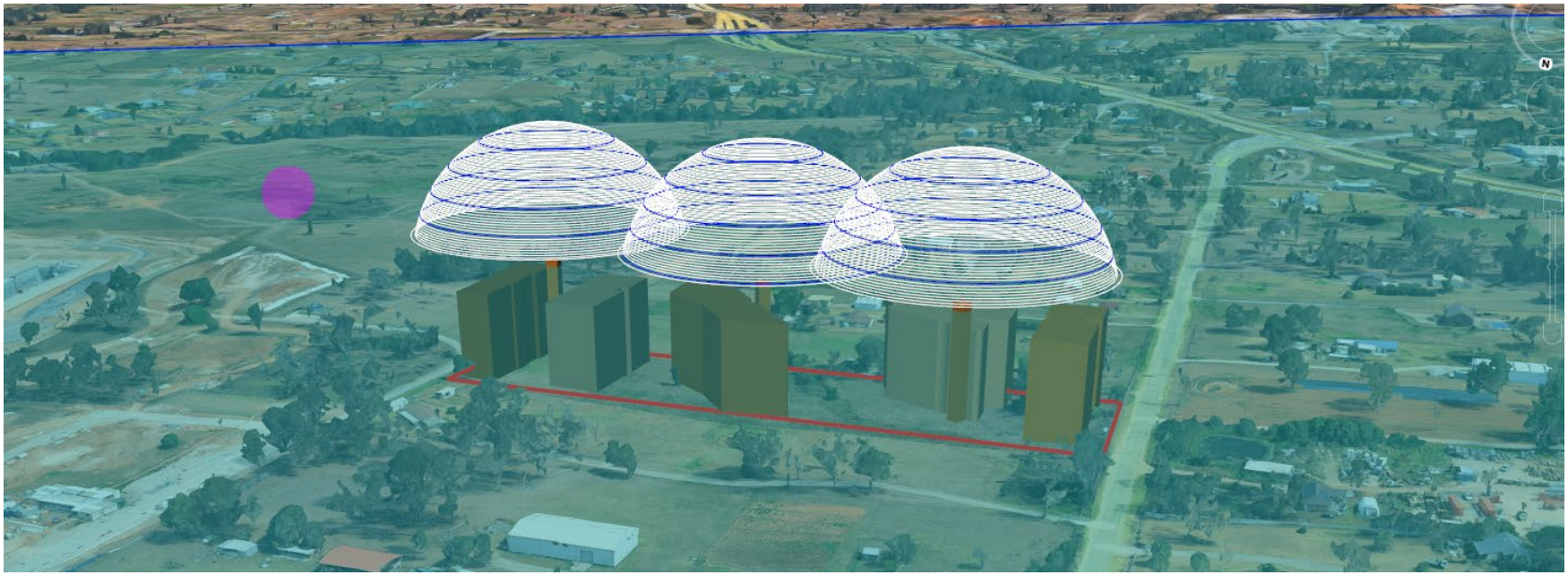


Figure 20: Avlaw's model of the WSI OLS (future two-runway operations), showing cranes intruding the Inner Horizontal Surface at 126.0m AHD

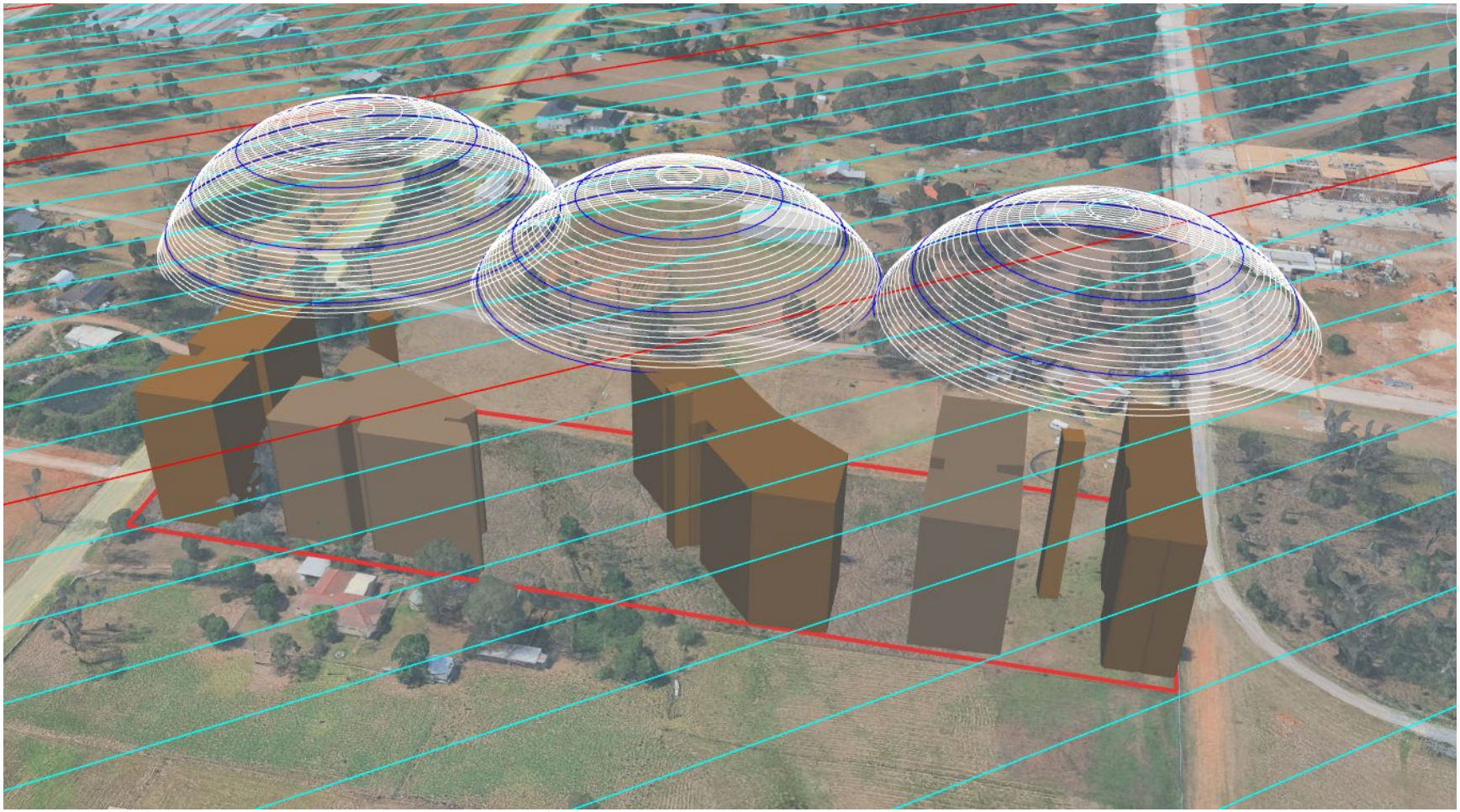


Figure 21: Avlaw's model of the WSI OLS (single runway operations), showing cranes intruding the conical surface (152.0m AHD to 163.6m AHD)

None of the proposed buildings at the site will intrude the WSI OLS. Therefore, no controlled activity approvals will be required for any permanent structures.

With respect to cranes, Avlaw has elected to model the proposed cranes based on both future two runway operations as well as single runway operations, with the latter resulting in a less significant intrusion into the prescribed airspace of WSI. This approach has been deemed justified given construction at the site is expected to be completed by 2033m which is well before the expected opening of the second runway at WSI in the 2050's. Avlaw believes this is a pragmatic way to assess the impact of cranes that will be erected at the site on the WSI OLS given only one runway will be operational during the entirety of construction. Ultimately, this methodology will need to be supported by key stakeholders including WSI, CASA and the Department.

In any case, all cranes that will be erected at the site will intrude the WSI OLS, irrespective of whether single or future two-runway operations are considered. When future two-runway operations are considered, all cranes at the site will intrude the Inner Horizontal Surface which is 126.0m AHD across the entire site.

Although this will need to be verified by Airservices Australia, all cranes are expected to remain below all other airspace protection surfaces which currently under development (see *PANS-OPS* below). Any approvals will be subject to specific conditions, including lighting and marking and specific dates of activity. These will be determined by CASA once a controlled activity application is lodged and a thorough assessment is completed based on specific dates of intrusion.

PANS-OPS

At the time of writing, no specific details relating IFP or PANS-OPS for WSI has been published. The formal advice on this subject that is contained in the Airport Plan reads as follows:

"Calculating the PANS-OPS surfaces is complex because of the highly technical nature of the design and interaction of procedures. The design of a full set of PANS-OPS for Stage 1 and long-term operations will be required following the formal flight path design before start of operations. Once designed, the PANS-OPS will be protected under the Airspace Protection Regulations."

In the interim, in order to assess whether proposed built structures of cranes are likely to penetrate the anticipated PANS-OPS surfaces, a number of assumptions based on what is known about WSI and worst-case scenarios have been used to conclude whether the heights proposed at the site are likely to be supported by aviation stakeholders. These are discussed below

- The site is perpendicular to the runways at WSI, so there will not be regular flight paths directly over the site (i.e. aircraft are expected to be aligned with the runways 10NM out).
- Given the site is perpendicular to the runways, aircraft will not be turning in its direction as they will need to achieve greater obstacle clearance than if they were to fly straight ahead (preferred for large aircraft anyway). This is based on ICAO SARPs which Australia is a party to. Without a need to avoid parallel traffic (because there will only be one runway in use during construction), aircraft will be flying straight in and out of the airport (i.e. not circling), and even if aircraft do double back after departing, it won't be after they have achieved a turn height which will be greater than what will impact that which is proposed at the site.
- There are two runways proposed for WSI, with the first to open further away from the site than the second runway (expected to open in the 2050's i.e. after construction of all stages

at the site is completed). The worst-case scenario which could impact the site (based on a two-runway operation) would be an aircraft conducting a missed approach on the southern runway (i.e. runway 23) and then turning left towards the site to avoid parallel traffic on the northern runway. Based on Minimum Obstacle Clearance (MOC) requirements, Avlaw approximates that the height of the PANS-OPS surface at the site would be nominally 165m AHD, but as explained, this scenario is N/A given the second runway will not be operational during construction.

- There are other aspects to how aircraft will be operating at WSI which relate to noise sharing, but Avlaw don't believe this will impede what is being proposed at the site.

Therefore, when WSI opens (by the end of 2026), only one runway will be in use (i.e. the northern runway 05L/23R) and the PANS-OPS surfaces relating to these operations are not expected to be penetrated by the proposed building or crane heights at the site.

Ultimately, aviation stakeholders including WSI, CASA, Airservices Australia and the Department will be involved in the controlled activity approval process and determine if the proposed built and temporary structures at the site are approved, which Avlaw expects will be the case.

Emissions and Plumes

Avlaw notes that CASR 139.180 states that *"CASA may determine a gaseous efflux having a velocity in excess of 4.3m/s will be a hazard to aircraft operations because of the velocity or location of the efflux".* Avlaw has not been provided any information relating to potential discharge from services equipment and given the location of the site in relation to the runways at WSI and the heights of building proposed, this is not expected to be flagged as an issue when detailed design is being completed. If identified, engineering solutions may need to be developed to mitigate the risks that may be introduced, which could include deflecting, cooling or expanding the flow of the plume to the reduce the concentration of energy, thus mitigating the risk to aircraft operations.

5.6 Aviation Facilities - Communications, Navigation and Surveillance (CNS)

The Department has published Guideline G of the NASF to provide advice to States and Territories, Local Government decision makers and others on planning protection within Building Restricted Areas (BRAs) to ensure no developments are approved that can adversely impact the Communication, Navigation and Surveillance (CNS) facilities related to air transport operations.

The location of all facilities that will be installed at WSI is unknown at the time of writing, however for the purpose of this analysis, Avlaw's assessment is specifically with regards to the glide path protection surfaces. The figures on the following two pages illustrate the area within which this impacts development near WSI.

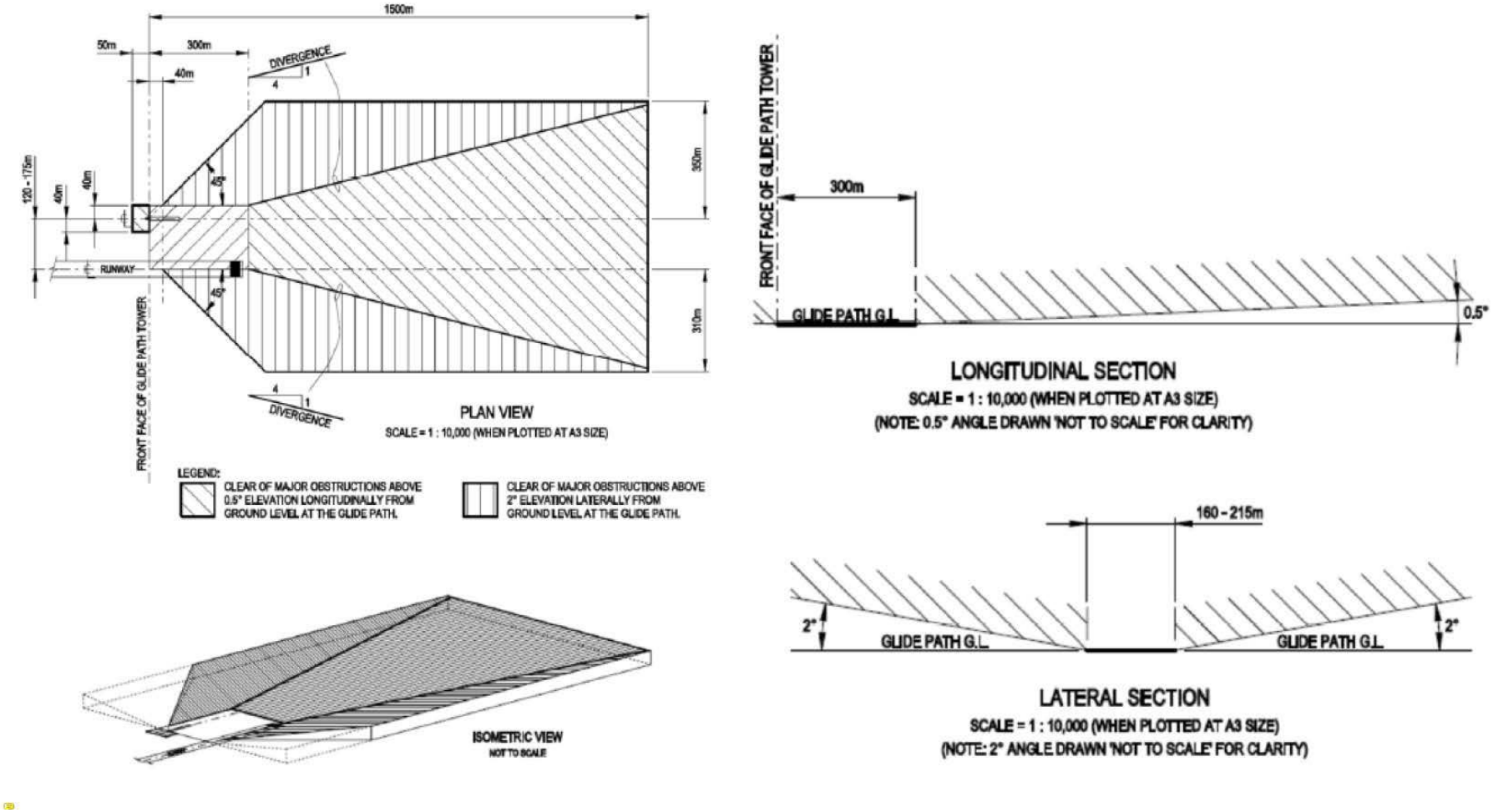


Figure 22: Various illustrations of the glide path protection surfaces

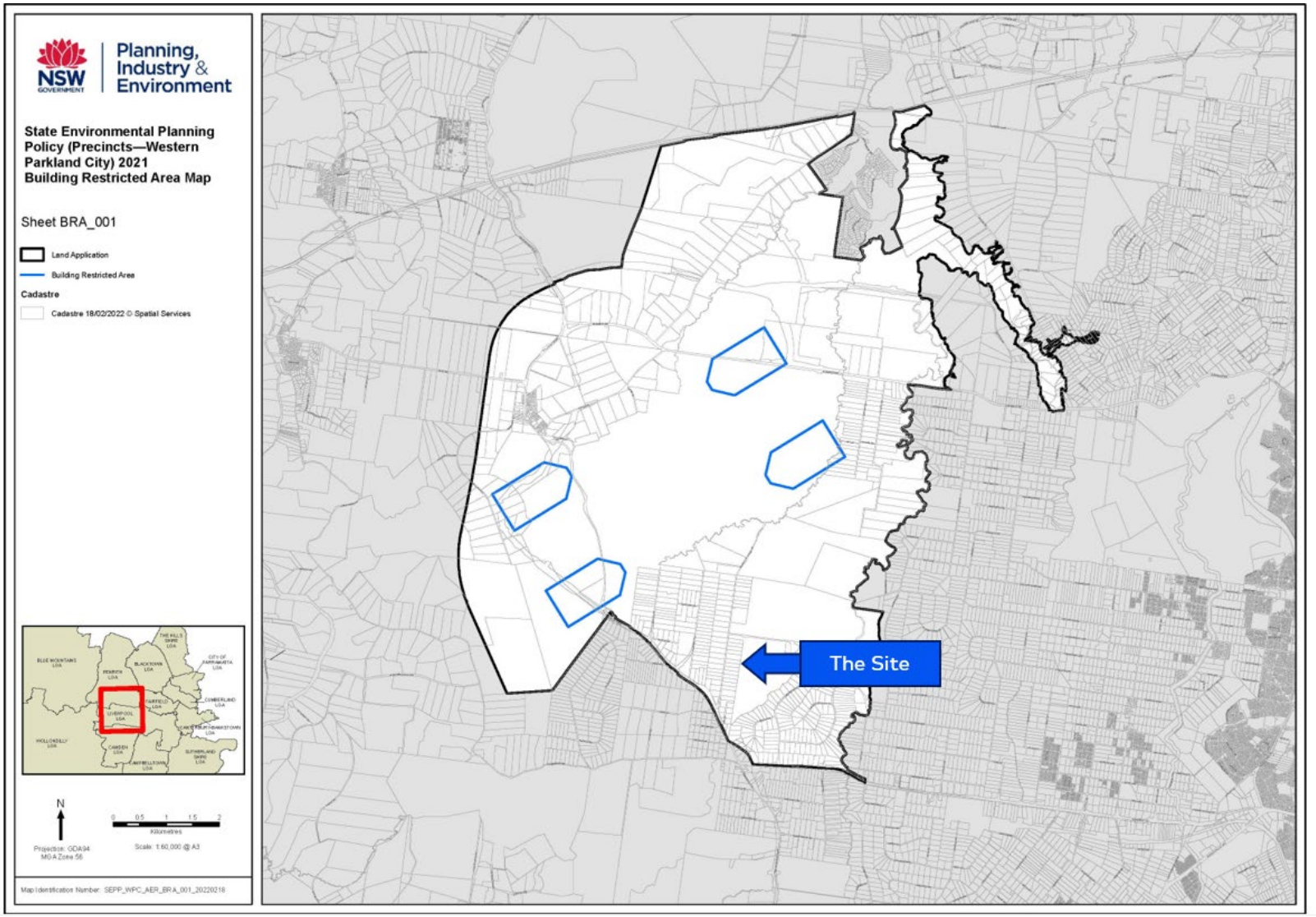


Figure 23: Building Restricted Area Map taken from SEPP (Precincts – Western Parkland City) 2021 showing glide path protection surfaces (2D)

As is shown above, the site is well clear of the BRA within which restrictions apply to the heights of structures in the context of their potential impact on the glide path protection surfaces. With regards to other potential impacts on CNS facilities, Airservices Australia is responsible for conducting such assessments before responding to proposed controlled activity applications and will do so once they are lodged with WSI and disseminated.

5.7 Strategically Important Helicopter Landing Sites

The triggers for assessment of proposed development activities with respect to airspace surrounding Helicopter Landing Sites (HLSs) are not captured within those that are in place to establish the prescribed airspace for an airport (e.g. OLS, PANS-OPS). NASF Guideline H has been developed to offer some form of protection to what are being termed Strategically Important Helicopter Landing Sites (SHLSs). Under the guideline, hospital helipads would be considered as SHLSs and therefore protected from obstacles being erected in close proximity to it.

The guideline defines 140m wide rectangular steps in the direction of the approach/take-off area in 500m long increments until reaching 125m above the SHLS. The steps, rising in 15m increments, are shown below in a figure that has been sourced from Guideline H that illustrates the area which is protected and the heights above which further assessment is triggered.

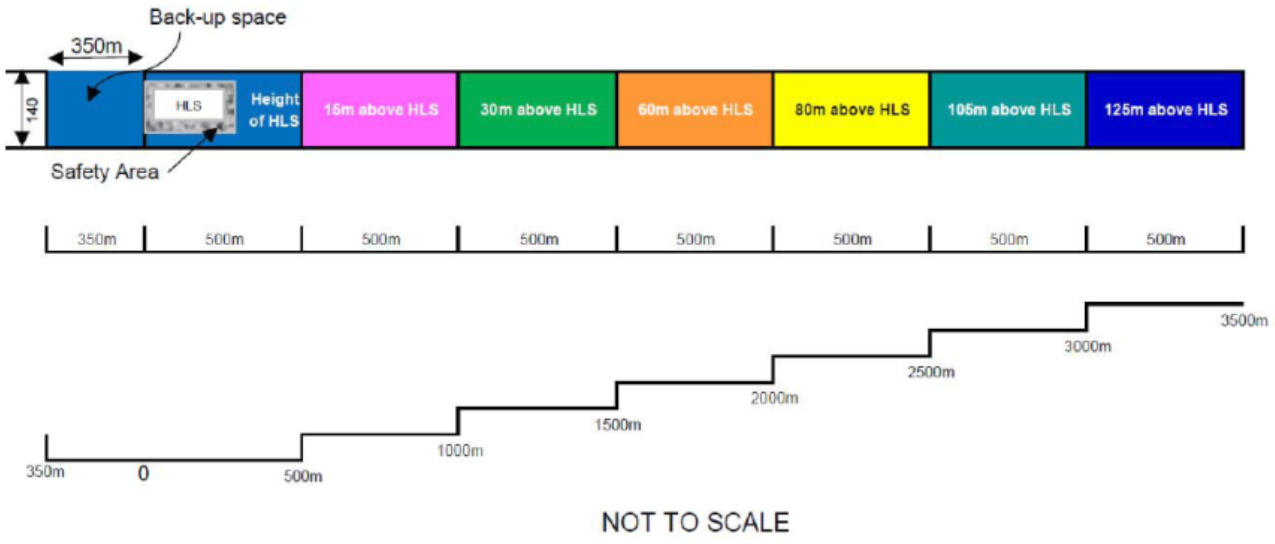


Figure 24: Referral trigger for SHLS

Applications for airspace approval for developments in close proximity to HLSs are lodged with the asset owner who in turn refer the application to their aviation advisors (if applicable) and Helicopter Emergency Medical Services (HEMS) operators that fly to/from the HLS in question for assessment.

The closest existing hospital to the site with a helipad is the Nepean Hospital, however that is approximately 18km away. Therefore, Avlaw can confirm that there are no existing hospitals with helipads in close enough proximity to the site to impose restrictions on the heights of buildings or cranes at the site. The development of new hospitals in the vicinity of the site should be monitored closer to construction to ensure these findings remain valid.

5.8 Public Safety Areas

An important aspect of compatible land uses which the site must be assessed against is the Public Safety Area (PSA) for WSI. These are designated areas of land at the end of runways within which development may be restricted in order to control the number of people on the ground. This is to reduce the risk of injury or death in the event an aircraft accident occurs during take-off or landing.

As is clearly shown on the following page, the site is well clear of the PSA for WSI, meaning no restriction on land use is imposed by this criterion.

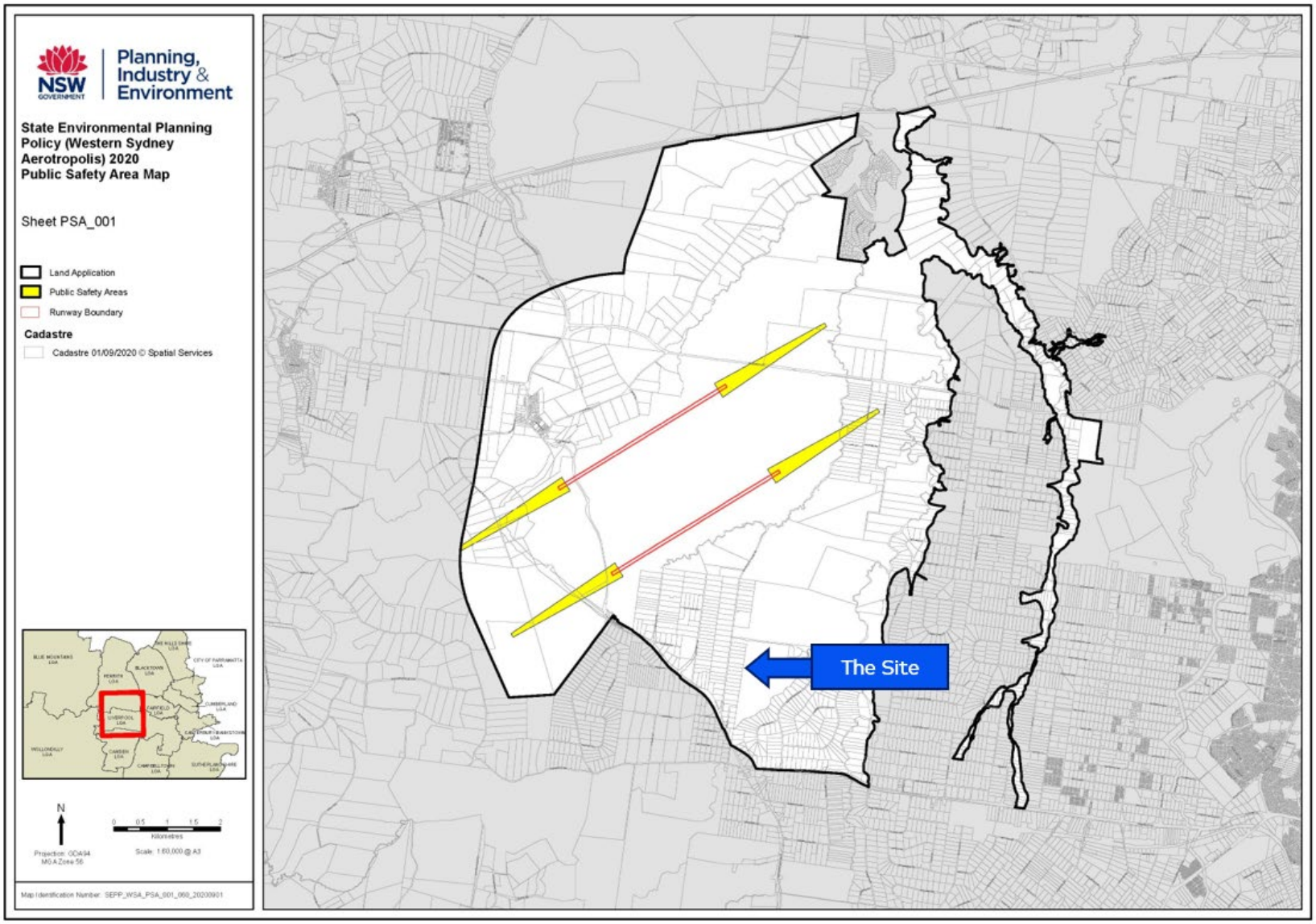


Figure 25: Extract from SEPP (Western Sydney Aerotropolis) 2020 PSA Map showing the site outside the restricted area

6

Proposed Temporary Obstacle Analysis

Proposed Temporary Obstacle Analysis

As has been explained earlier in this report, the proposed development at the site will result in temporary intrusions of the WSI OLS by cranes in each of the three stages of development. Depending on whether this is based on single or future two-runway operations, the results and extent of the intrusions proposed differ slightly.

When single runway operations are considered, it is the Conical Surface which is penetrated by the cranes at the site. When two-runway operations are considered, this changes to the Inner Horizontal Surface. This distinction is made here based on an extract (inserted below) from 'Technical Paper 6: Land use planning' of the WSI EIS (accessible here) which clearly states that a revised version of the OLS based on operations at WSI when it opens in 2026 is required. The following page illustrates the difference between the OLS impacting the site when single runway operations are compared against future two-runway operations.

1.5 Obstacle limitation surface (OLS)

The obstacle limitation surface is a series of surfaces (height controls) that define the limits to which structures or objects may project into the airspace to ensure the safety of aircraft. The purpose of the OLS is to ensure that development within the OLS area is examined for its impact on future aircraft operations and that it is properly taken into account.

WSI's protected airspace was prescribed by declaration on 19 October 2017 under the provisions of the Airports Act and Airports (Protection of Airspace) Regulation 1996. The declaration of the OLS balances the need to ensure a safe operating environment for aircraft with the community's need for clarity about development surrounding the airport. Declaration of the OLS enabled local councils and land use planning authorities to incorporate the protected airspace as appropriate in their land use planning instruments.

The OLS needs to be revised to reflect operation of the single runway (runway 05-23) and DITRDCA is currently in the process of getting the revised OLS prescribed, identifying intrusions and determining appropriate action.

While the prescribed (2017) OLS has been used as the basis of this assessment, discussion is provided in Chapter 4 regarding the potential impacts of a revised OLS.

The relevance of the OLS to land use planning is discussed in Section 2.2. The OLS for WSI is shown on Figure 1.8.

Figure 26: Extract from WSI EIS referencing a OLS based on single-runway operations

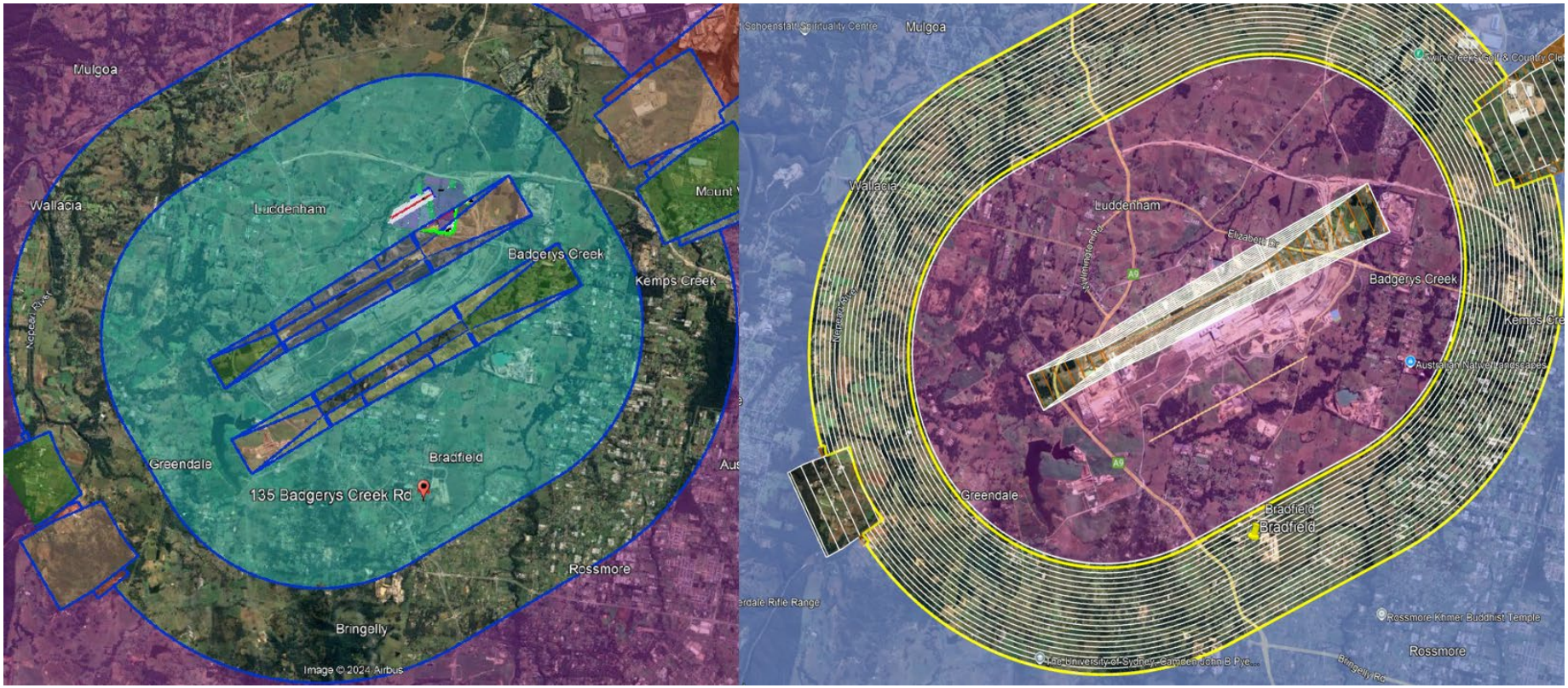


Figure 27: OLS based on future two-runway operations (left) compared to the OLS for single-runway operations (right)

Figure 28: Close up of Avlaw's modelling of the single-runway OLS at WSI OLS

Note: the red contour passing through the site is 160m AHD, with each blue line representing a 1m increment, which rises to the SE away from WSI

Penetration of the OLS is a consideration for practically every airport in the world, and WSI will be no exception, not only with respect to the development at the site, but beyond its boundary too. At the time of writing, given the airport is not open to the public yet and the surrounding suburbs remain largely undeveloped, this is not an immediate issue. However, this is certain to emerge in the years following commencement of commercial aircraft operations to facilitate the growth in the surrounding areas needed to maximise the potential economic benefits associated with WSI. The balance between ensuring the safety, efficiency and regularity of aircraft operations against public interest will be crucial. The potential for more tall structures to be approved near WSI than what may ordinarily have been the case in decades past will be closely tied to whether a revised concept for the OLS is adopted in Australia following further development by ICAO.

Based on advice received by CASA with respect to other proposed developments in close proximity to an airport, the Airport Services Manual Part 6 Control of Obstacles Sub-section 1.2 was reviewed in detail as it relates specifically to the Inner Horizontal Surface and Conical Surface, which are of most relevance to the development at the site. This section makes provision for the penetration of obstacles through these surfaces as follows:

1.2.3.1 *The purpose of the inner horizontal surface is to protect airspace for visual circling prior to landing, possibly after a descent through cloud aligned with a runway other than that in use for landing.*

1.2.3.2 *In some instances, certain sectors of the visual circling areas will not be essential to aircraft operations and, provided procedures are established to ensure that aircraft do not fly in these sectors, the protection afforded by the inner horizontal surface need not extend into those sectors. Similar discretion can be exercised by the appropriate authorities when procedures have been established and navigational guidance provided to ensure that defined approach and missed approach paths will be followed.*

ICAO Annex 14 Vol 1 Aerodrome Design and Operation Sub-section 4.2 also makes provision as follows: (emphasis added)

4.2.20 Recommendation — New objects or extensions of existing objects should not be permitted above the conical surface and the inner horizontal surface except when, in the opinion of the appropriate authority, an object would be shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes

Avlaw believes that if the proposed cranes are marked and lit (in accordance with MOS 139) and a NOTAM is published to inform airspace users of the locations and heights, that the risks associated with the intrusion of the cranes at the site through the WSI OLS will be deemed to be mitigated appropriately. The cranes are well clear of the immediate approach and take-off areas of any of the runways at WSI and are expected to be well below all other airspace protection surfaces that are currently being designed by Airservices Australia. Therefore, Avlaw believes that controlled activity approvals should be given to allow the development to proceed.

7

Conclusions

Conclusions

The proposed development at the site has been assessed against all applicable NASF Guidelines. The findings of this assessment are summarised below:

- The proposed development is not impacted by any land use restrictions in the context of aircraft noise
- The site is outside the assessment trigger area which is impacted by potential windshear and turbulence considerations
- The primary proposed land uses will require monitoring of wildlife hazards as the site falls within the 3km zone for WSI. Monitoring and mitigation strategies associated with other ancillary uses are addressed separately by the ecologist engaged by Bradfield
- The site falls completely outside all lighting zones associated with both runways at WSI. Being within 6km of the airport, CASA will review the lighting proposed at the site to ensure that no hazards or distractions to pilots are introduced.
- The built structures at the site will all remain below the OLS for WSI, whilst temporary structures will intrude and should be approved with specific conditions that will be determined by CASA. Other airspace protection surfaces are currently under development and will be confirmed by Airservices Australia, however Avlaw do not believe they will be any more restrictive than the WSI OLS.
- The site is well clear of the BRA for WSI. Airservices Australia will need to complete a thorough assessment of the potential impact of the buildings proposed at the site on all other CNS facilities.
- The site is clear of any currently established HLS'. This will need to be re-assessed as Bradfield nears commencement of construction to ensure that this conclusion remains valid if new sites are constructed and operational in the years to come.
- The site is clear of the PSA of all runways at WSI.

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