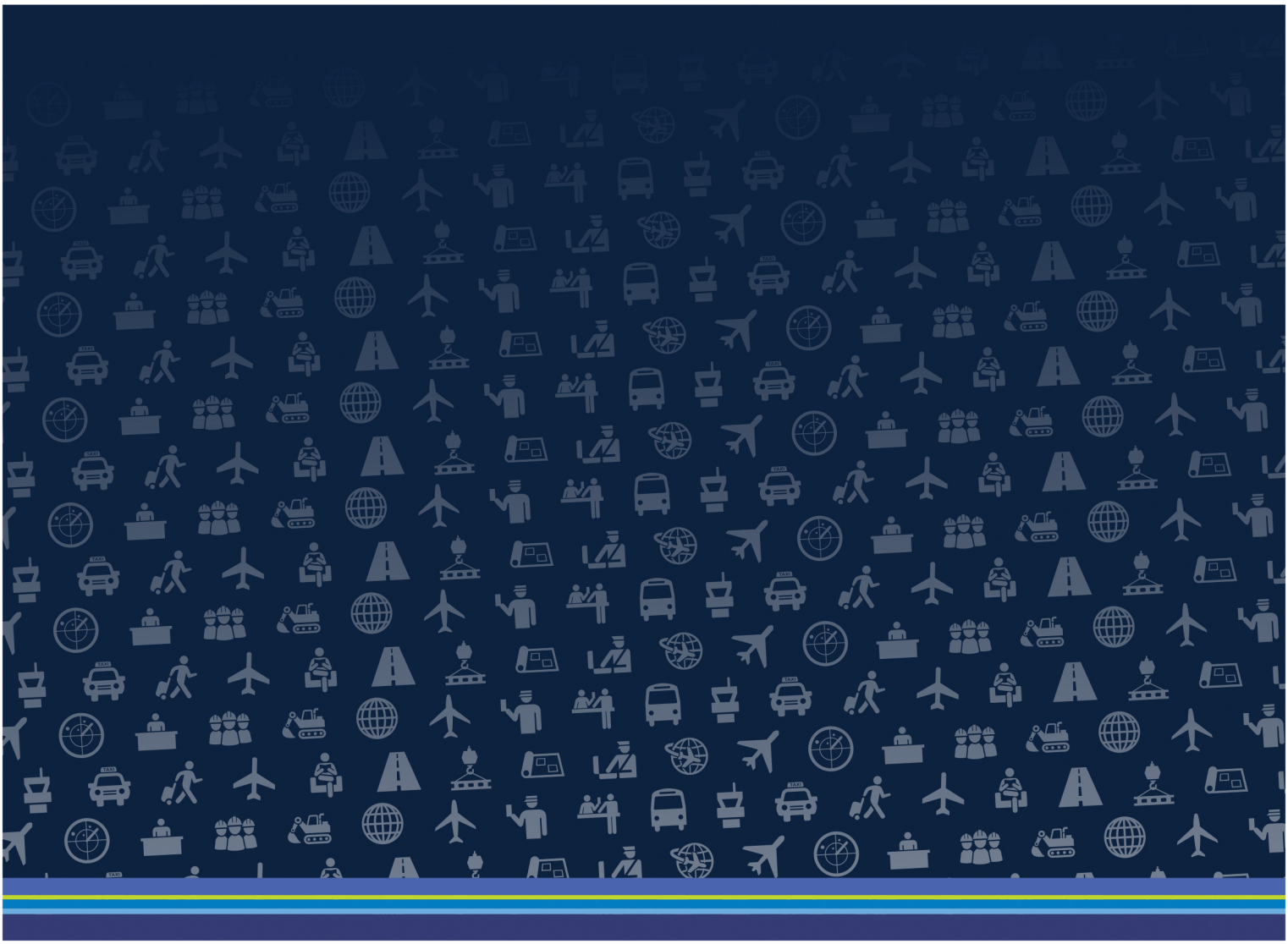
Executive Summary



Executive Summary

Introduction to Western Sydney Airport

On 15 April 2014 the Australian Government announced that Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney airport. The Badgerys Creek airport site was selected following extensive studies completed over a number of decades and culminating in the release of the *Joint Study on Aviation Capacity in the Sydney Region* (Joint Study) (Department of Infrastructure and Transport 2012) in March 2012 and A Study of Wilton and RAAF Base Richmond for Civil Aviation Operations (DIRD 2013) (the Wilton and Richmond Study) in April 2013.

The proposed Western Sydney Airport (proposed airport) would 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. An airport in Western Sydney would also provide long term economic and employment opportunities in the surrounding area and accelerate the development of critical infrastructure and urban development. The proposed airport is planned to be operational by the mid-2020s and would service both domestic and international markets. Development would be staged in line with ongoing growth in aviation demand.

- Catering for increasing demand for air travel in Western Sydney and the broader Sydney region, the proposed Western Sydney Airport is predicted to cater for 10 million passengers per year by 2030, similar to Adelaide Airport, increasing to 82 million by 2063. It would also provide critical additional aviation capacity within the Sydney Basin as Sydney Airport becomes increasingly constrained over the coming decades.
- The estimated workforce during construction of Stage 1 would be expected to peak at around 700 to 800 jobs in 2022. Cumulatively, construction of the proposed airport would generate approximately 3,200 person-years[1] of direct employment. In addition there would be indirect and induced employment in Western Sydney for 8,000 person-years over the construction period between 2016 and 2024. During the same period, the proposed airport would generate an additional 2,200 person-years of indirect and induced employment in the Greater Sydney Metropolitan region.
- There would be an estimated 8,730 direct jobs generated at the proposed airport in 2031. This is based on a ratio of 750 airport employees per million annual passengers.
- Over the long term, by around 2063, the airport is anticipated to deliver an estimated 61,500 direct jobs at the airport site.

[1] *Person-years is a measure of employment which accounts for the employment of one person in a full-time capacity for one year. It provides a consistent basis for accounting for employment where, for example, one person might be employed full time for five years or five different people working in different roles of one year each (both of which would be 5 person years).*

The airport site covers an area of approximately 1,700 hectares at Badgerys Creek in Western Sydney, as shown in Figure ES 1. The airport site is located within the Liverpool local government area (LGA), around 50 kilometres west of Sydney's central business district (CBD) and 15 to 20 kilometres from major population centres including Liverpool, Fairfield, Campbelltown and Penrith, and 30 kilometres from Parramatta.

The Northern Road transects the western end of the airport site and Elizabeth Drive borders the site to the north. Badgerys Creek flows in a north-easterly direction and forms the south-eastern boundary of the airport site. The airport site is located on undulating topography that has been extensively cleared, with the exception of stands of remnant vegetation located predominantly along Badgerys Creek and in the south western portion of the site.

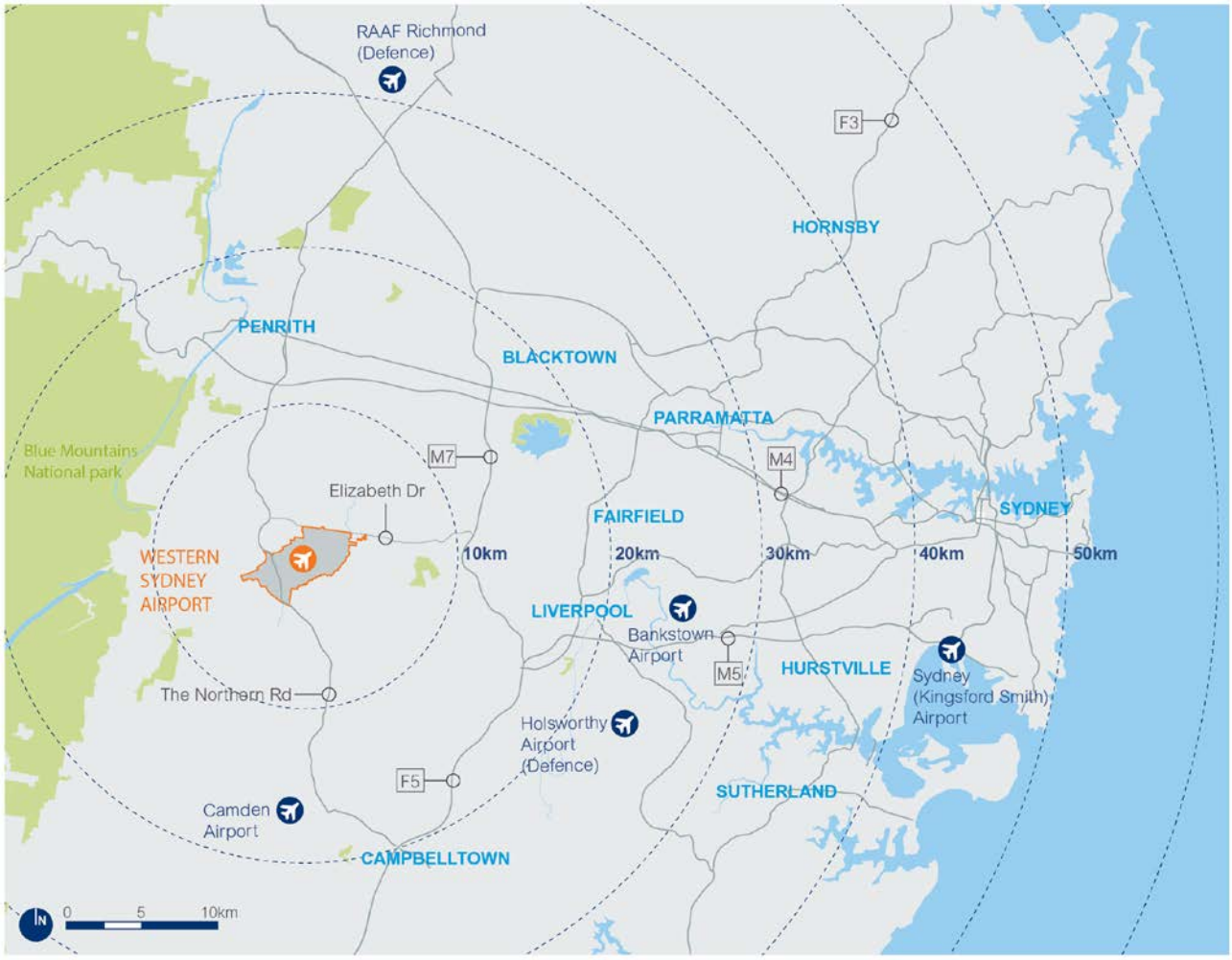


Figure ES 1 – Location of the proposed Western Sydney Airport

Historical context

The need and potential location for a second airport in the Sydney region has been considered periodically since 1946. A summary of the major studies and key milestones in the selection of Badgerys Creek as the location of the proposed airport is shown in Figure ES 2.

Badgerys Creek was first identified as a preferred site in the *Major Airport Needs of Sydney* (MANS) study (MANSSC 1979). The MANS study assessed sites within a number of zones including a northern zone (near Scheyville, Nelson and Galston), north-western zone (near Richmond and Londonderry), south-western zone (near Badgerys Creek and Bringelly) and a southern zone (in the Holsworthy Military Area). The study identified Badgerys Creek as the preferred site on environmental, economic and financial grounds.

Badgerys Creek was again identified as the preferred site for a second airport in the *Second Sydney Airport Site Selection Programme Draft Environmental Impact Statement* (Kinhill Stearns 1985) (1985 EIS). The programme evaluated 10 sites: Badgerys Creek, Bringelly, Darkes Forest, Goulburn, Holsworthy, Londonderry, Scheyville, Somersby, Warnervale and Wilton. Badgerys Creek and Wilton were short listed through this process and the two sites were subsequently assessed in an environmental impact statement (EIS), with Badgerys Creek again identified as the preferred site.

Badgerys Creek was first formally announced as the site for a major airport by the Australian Government in 1986. Land acquisitions made at Badgerys Creek from the mid-1980s form the basis of the current airport site. The land acquired has remained in Commonwealth ownership since that time.

In January 1996, the Australian Government announced that an EIS would be prepared for the construction and operation of a second Sydney airport at Badgerys Creek. The scope of the environmental assessment process was broadened to include an alternative to the Badgerys Creek site at Holsworthy Military Area, but this was subsequently ruled out as an option on environmental grounds. The *Environmental Impact Statement Second Sydney Airport Proposal* (PPK 1997) (1997–99 EIS) assessed the environmental, social and economic impacts of constructing and operating a second major airport at Badgerys Creek. In providing recommendations and advice on the 1997–99 EIS, the then Minister for the Environment found that there were no insurmountable challenges to developing an airport at Badgerys Creek.

More recently, Badgerys Creek was identified as the preferred site in the Joint Study (Department of Infrastructure and Transport 2012). The study assessed 80 sites across 18 locations including Wilberforce, Somersby, Wilton, Luddenham and Badgerys Creek. An airport at Wilberforce was discounted as it would likely require closure of RAAF Base Richmond, while Somersby was discounted due to conflict with Sydney Airport airspace. Wilton was considered too far from most airport users to justify the development of an airport. Both Luddenham and Badgerys Creek were considered to be geographically well placed in relation to growth areas, with Badgerys Creek the preferred choice based on its higher benefit cost ratio. The Wilton and RAAF Base Richmond Study (DIRD 2013) subsequently supported these findings, noting a ‘clear preference’ within the aviation industry for an airport at Badgerys Creek.

1946
First investigation into the best site for further airport development in/around Sydney considers three options including a site at Towra Point and expansions of existing airports at Bankstown and Mascot.

1969
Advisory committee to the Australian Government considers 11 potential sites for a second airport, including a site at Badgerys Creek.

1971
Advisory committee narrows potential locations to sites in Richmond, Somersby, Duffys Forest and Wattamolla.

1972
Benefit-cost analysis undertaken of an additional 106 sites. Assessment reduces the number of sites to five potential sites: Towra Point, Rouse Hill/Nelson, Long Point, Marsden Park and Bringelly.

1973
Government announces that Galston has been selected as the site for a potential second airport (decision reversed in 1974 following further consideration).

1976
Major Airport Needs of Sydney Study Committee convened as a joint initiative by the Federal and State governments. Study considers six sites including Londonderry, Scheyville, Austral, Long Point, Bringelly and Badgerys Creek.

1979
Preliminary report released by the Major Airport Needs of Sydney Study Committee. Scheyville and Badgerys Creek shortlisted as potential sites, but development could not be justified before a third runway at Sydney Airport.

1982
Third runway at Sydney Airport announced (decision reversed in 1983).

1983
New programme announced to identify a site for a second airport in Sydney (the Second Sydney Airport Site Selection Programme). Ten sites re-examined: Bringelly, Darkes Forest, Goulburn, Holsworthy, Londonderry, Scheyville, Somersby, Warnervale, Wilton and Badgerys Creek.

1985
Wilton and Badgerys Creek assessed in detail in Second Sydney Airport Site Selection Programme Draft Environmental Impact Statement.

1986
Badgerys Creek announced as the site of the second airport. Acquisition of land begins (completed by 1991).

1991
Decision made to proceed with the construction of a third runway at Sydney Airport and an initial development of a general aviation airport at Badgerys Creek.

1994
Third runway at Sydney Airport opens and the plans to develop the Badgerys Creek site are expanded to provide an international standard airport in time for the Sydney 2000 Olympics.

1996
Government announces that an EIS will be prepared for the development of a second Sydney airport at Badgerys Creek. Scope subsequently broadened to include a potential site at Holsworthy Military Area.

1997
Holsworthy Military Area ruled out on environmental grounds and draft EIS released for public comment prior to finalisation in 1999.

2000
Further development of a potential second airport at Badgerys Creek put on hold.

2004–08
Further consideration of other potential sites by the Australian and NSW governments, including Well's Creek, Camden, RAAF Base Richmond and expansion of the existing Canberra Airport.

2009
Joint Australian and NSW government steering committee appointed to guide a Joint Study on Aviation Capacity for the Sydney Region (the Joint Study).

2012
The Joint Study is released and concludes that an additional airport would be needed from around 2030 and that out of 80 sites considered, Badgerys Creek would be the most logical and cost effective site.

2013
Study into the suitability of Wilton as a second airport and limited civil operations at RAAF Base Richmond supported previous findings that Badgerys Creek would be the most economically viable option for further development.

2014
Australian Government announces that Badgerys Creek will be the site for a second airport for Sydney. Department of Infrastructure and Regional Development start preparing EIS.

Figure ES 2 – Key milestones in the development of the proposed Western Sydney Airport

Most recently, on 15 April 2014, the Australian Government announced that the Commonwealth owned land at Badgerys Creek will be the site for a second Sydney airport. The announcement was followed by the Western Sydney Infrastructure Plan, committing $3.6 billion over ten years to major road upgrades in Western Sydney to relieve pressure on existing infrastructure and provide connectivity to the airport before operations commence.

The need for a new airport

The need for development of the proposed airport is driven by the continued growth in demand for aviation services in Western Sydney and the Sydney region more broadly and physical constraints at the existing Sydney Airport.

Aviation services are critical to a well-functioning developed country like Australia. Efficient access to air services for passenger travel and high-value freight is essential to ensure that Sydney remains an international commercial and financial centre and keeps its place as Australia's foremost tourist destination.

Sydney Airport has limited ability to handle further passenger growth due to the physical constraints at the existing site. The limitations of existing infrastructure are becoming apparent at peak times and are expected to become more pronounced over the coming decades.

According to the Joint Study, in the absence of additional aviation capacity in the Sydney region:

- by 2020, all weekday slots for periods at Sydney Airport between 6.00 am and 12 noon and between 4.00 pm and 7.00 pm would be fully allocated;
- by around 2027, all slots at Sydney Airport would be allocated, so new entrants cannot be accommodated, unless another service were cancelled; and
- by around 2035, there would be practically no scope for further growth of regular passenger services at Sydney Airport.

Demand for aviation services is anticipated to continue to increase to service Sydney's ongoing growth in population and business activities. Any shortfall in capacity to meet demand would affect future economic growth, productivity, employment, lifestyle and amenity. Notably, the Joint Study found that the economic cost of not meeting the expected increased demand would be substantial.

By 2060, the economy-wide (direct and flow-on) impacts across all sectors of the Australian economy could total $59.5 billion in foregone expenditure and $34.0 billion in foregone gross domestic product (based on 2010 dollars). The NSW economy would be especially heavily affected, with losses across all industries totalling $30.6 billion in foregone expenditure and $17.5 billion in foregone gross state product.

Strategic alternatives to the development of a new airport in Western Sydney have been assessed over a long period of time. Commonly referenced alternatives include increasing the capacity of Sydney Airport or other existing airport facilities, establishing a new airport outside the Sydney basin or using high speed rail as a substitute for aviation services. While these alternatives have demonstrated potential to provide marginal capacity benefits, they would not replace the need for the proposed airport. Detailed studies have been undertaken over a number of decades to assess these alternative options and have consistently found that the most effective way to address increased aviation demand, while mitigating environmental and social impacts, is to develop a new airport at Badgerys Creek.

Growth in Western Sydney

As well as providing additional aviation capacity in the Sydney region, locating the proposed airport at Badgerys Creek would provide access to aviation infrastructure in Western Sydney for this heavily populated and growing region. Development of the proposed airport is expected to provide the current and future community with improved access to aviation services by reducing travel times, increasing destination choice and increasing competition.

Western Sydney is a dynamic multicultural region and is currently home to around 47 per cent of Sydney's population and nine per cent of Australia's population. Over the next 20 years, the number of people in Western Sydney will grow faster than other parts of Sydney, with almost one million more people expected to live west of Homebush by 2031 (DP&E 2014).

There are a number of key industries in the area that depend on air transport services based in the area and the development of a new airport is likely to trigger further growth in aviation dependent industry sectors given the availability of land, labour and transport linkages.

The south-west subregion is the fastest growing subregion in Sydney and a new airport would be a major catalyst for growth in investment, infrastructure and jobs throughout this area.

The need for a new EIS

Development of an airport at Badgerys Creek has been assessed through the preparation of two previous environmental impact statements. The 1997-99 EIS (PPK 1997) is the most recent comprehensive environmental assessment and considered three separate options for the development of the airport site. Option A proposed a 50/230 degree runway orientation and location, substantially the same as currently proposed, however the capacity of the airport site was limited to 30 million passengers annually.

In September 2014, SMEC Australia was commissioned by the Department of Infrastructure and Regional Development (the Department) to undertake an environmental field survey of the Commonwealth owned land at Badgerys Creek. The purpose of the field survey was to update the Australian Government's knowledge of flora and fauna, European and Aboriginal heritage and hydrology aspects of the land at Badgerys Creek. The resulting report, *Environmental Field Survey of Commonwealth Land at Badgerys Creek* (SMEC 2014) found that the previous EISs, although comprehensive and useful as background information, were outdated due to changes in legislative requirements and obligations, best-practice and industry standard assessment methods, and threatened flora and fauna listings. In addition, there have been substantial changes to the indicative design and operational parameters of the proposed airport, reflecting the changing nature of airports as centres of economic activity. As such, the Australian Government commenced a new environmental assessment for the proposed airport.

This draft EIS has been developed to assess the proposed airport in the context of an updated concept design, demand forecasts, regulatory framework (as outlined below) and the contemporary regional setting for Western Sydney. Where relevant, information from previous assessments such as the 1997-99 EIS (PPK 1997) has been used to support technical information required for this draft EIS.

The proponent

The proponent for the development and operation of the proposed airport is the Australian Government Department of Infrastructure and Regional Development (the Department).

The Department is responsible for national policies and programmes that promote, evaluate, plan and invest in infrastructure and regional development, and foster an efficient, sustainable, competitive, safe and secure transport system for Australia. The Department administers the *Airports Act 1996* (Airports Act) (and its associated regulations) and the Minister for Infrastructure and Regional Development is responsible for the approval of all major developments at federally leased airport facilities across Australia as defined by the Airports Act. The proposed airport would be developed and operated under the Airports Act. Construction to prepare the site, including earthworks may be undertaken by the Australian Government or the private sector. An airport lease would be granted by the Australian Government to an airport lessee company (ALC), which would then become responsible for developing and operating the proposed airport.

The Australian Government is required to meet its obligations in relation to Sydney Airport Group's right of first refusal to develop and operate a second Sydney airport. This right was granted as part of the Government's sale of Sydney Airport in 2002 and is applicable to the proposed airport. The right of first refusal consists of a number of phases, including a consultative phase and a contractual phase. The first phase consisted of a nine-month consultation between the Australian Government and Sydney Airport Group which concluded on 30 June 2015.

If the Government decides to proceed with the project, a contractual offer (a 'Notice of Intention') would first be issued to Sydney Airport Group. Sydney Airport Group would then have the opportunity to exercise its option to develop and operate the airport. The Notice of Intention would set out the detailed terms for the development and operation of an airport at Badgerys Creek, including technical specifications, contractual terms and development timetables.

Should Sydney Airport Group decline the opportunity, the Australian Government may approach the market, or develop the airport itself.

Regulatory framework

The proposed airport is one of the largest infrastructure projects considered in Australia in recent years and would be the first major new Australian airport development in decades.

Development of the proposed airport is subject to a Commonwealth environment and development approvals framework. Development at existing federally leased airports requires approvals under the Airports Act, through the approval of major development plans submitted by an ALC.

As this process did not appropriately cater for development of an airport at a new site, the Australian Parliament passed amendments (*Airports Amendment Bill 2015* – 'Airports Act amendments') to provide for a single and transparent mechanism to seek planning, environment and development approval for Stage 1 of the proposed airport. The Airports Act amendments provide for the preparation of an 'Airport Plan' to guide the development of the airport, which is to be determined by the Minister for Infrastructure and Regional Development. The finalisation of the draft EIS is a pre-condition to the determination of the Airport Plan under the Airports Act.

Accordingly, the Airports Act amendments strengthen the Minister for the Environment's role under the Airports Act in relation to the Airport Plan. This draft EIS has been prepared and will be finalised under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Department of the Environment issued guidelines for the content of a draft EIS for the proposed airport in January 2015. This draft EIS has been prepared in accordance with the requirements of the EPBC Act and the EIS guidelines , including the requirement for public consultation. In determining the Airport Plan, the Minister for Infrastructure and Regional Development must accept any environmental conditions proposed by the Minister for the Environment, taking into account the finalised EIS.

To this end, the draft Airport Plan sits alongside this draft EIS as a companion document. The draft Airport Plan specifies how Stage 1 of the proposed airport is to be developed on the Badgerys Creek airport site, while this EIS assesses the environmental, social and economic impacts associated with the Stage 1 development, as shown in Figure ES 3.

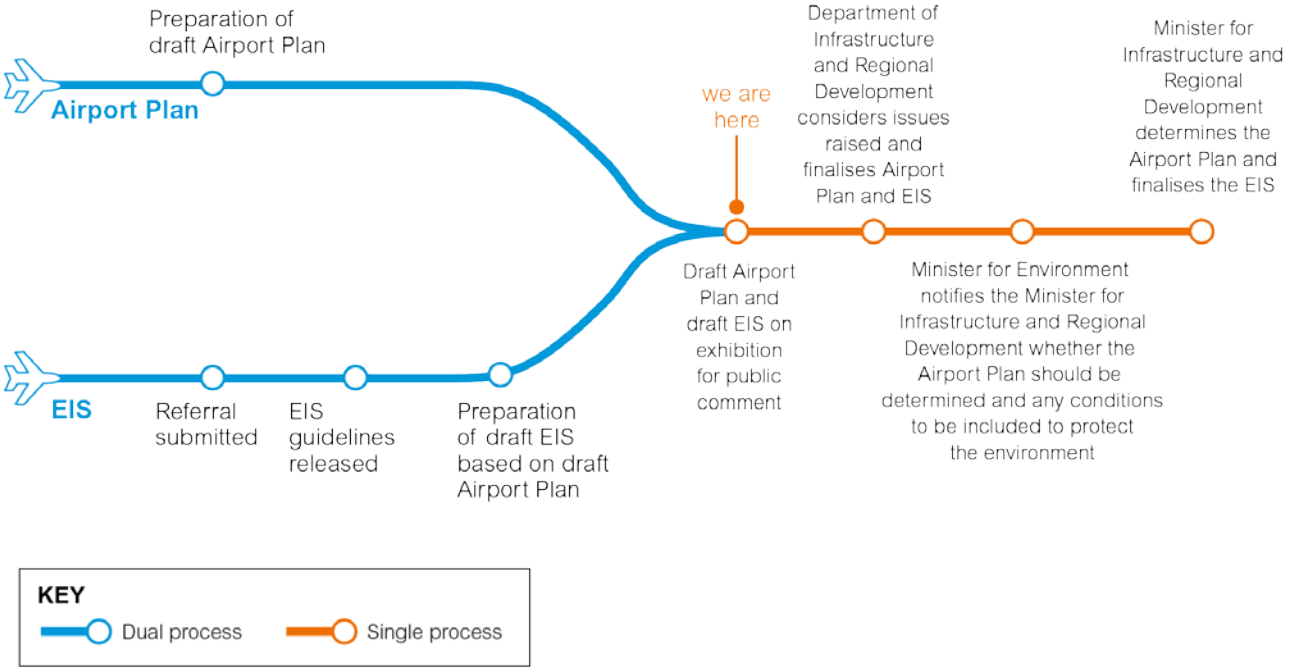


Figure ES 3 – Proposed Western Sydney Airport approval process

The draft EIS and draft Airport Plan will be placed on public exhibition concurrently for a duration to be determined by the Minister for the Environment. During the public exhibition period any person, group, corporation or agency can submit comment on the draft EIS and/or the draft Airport Plan to the Department. A copy of all comments received on the draft EIS will be forwarded to the Department of the Environment.

The draft EIS and the draft Airport Plan must be revised taking account of comments received during the exhibition period. The finalised EIS will also provide any additional information that may be relevant to the Minister for the Environment's consideration of the environmental impacts of the proposal.

The Minister for the Environment will consider the draft Airport Plan (having regard to the finalised EIS) from an environmental perspective and notify the Minister for Infrastructure and Regional Development whether the Airport Plan should be determined and, if it is determined, whether any specific conditions or provisions should be included for the purpose of protecting the environment.

If the Minister for the Environment is satisfied with the draft Airport Plan, the Minister for Infrastructure and Regional Development may determine the Airport Plan. The Airport Plan must include any conditions or provisions specified in a notice from the Minister for the Environment.

The role of an Airport Lessee Company

Once an airport lease is granted, the airport lessee company (ALC) would be responsible for the implementation of the proposal in accordance with an Airport Plan. The ALC would also be responsible for planning and development assessment for all future development of the airport in accordance with the Airports Act and other regulatory requirements.

Within five years of an airport lease being granted by the Commonwealth for the airport site, or such longer period as approved by the Minister for Infrastructure and Regional Development, the ALC would be required to submit a master plan for approval by the Minister for Infrastructure and Regional Development. The Minister is able to refuse to approve a master plan that is not consistent with the Airport Plan.

All future development for the proposed airport must be consistent with the master plan and existing regulatory requirements contained in the Airports Act, including requirements for public consultation and approval of major development plans for major or sensitive developments.

The Airport Plan

Stage 1 of a Western Sydney Airport would be constructed and operated in accordance with the Airport Plan, which forms a transitional planning instrument under the Airports Act. The Airport Plan consists of three main parts:

- Part 1 is the title section and provides an overview and regulatory context;
- Part 2 outlines the concept design for the Stage 1 development and an overview of the long term development; and
- Part 3 details the specific developments which will form the Stage 1 development.

The concept design outlined in Part 2 of the draft Airport Plan provides the planning framework for the proposed airport until the first master plan is in place. This part includes the development objectives, indicative flight paths, projected aircraft noise contours and the land use plan for the airport site.

The Airport Plan can only be varied in accordance with the Airports Act.

The initial airport development (referred to as Stage 1) is designed to cater for the predicted demand of up to 10 million passengers annually as well as freight traffic for five years following opening around 2025 until around 2030.

The draft Airport Plan also refers to the potential long term development of the proposed airport. As demand increases beyond 10 million annual passengers, additional aviation infrastructure and aviation support precincts would add capacity to meet growing aviation demand.

It is anticipated that the proposed airport may eventually expand to include a second parallel runway on the same north-east/south-west orientation as the Stage 1 runway, with associated expansion in aviation supporting facilities. The need for a second runway would be triggered when the operational capacity approaches 37 million annual passengers, which is forecast to occur by around 2050. The long term passenger capacity of approximately 82 million annual passengers is forecast to occur by around 2063.

The Land Use Plan as presented in the draft Airport Plan (presented in Figure ES 4) would be applicable in the period between an airport lease being granted to an ALC and a master plan being developed by the ALC and approved by the Minister for Infrastructure and Regional Development. The Land Use Plan regulates the types of development, in terms of permissible land uses, that can occur within the airport site. It also outlines land uses and indicative developments that would facilitate long term growth.

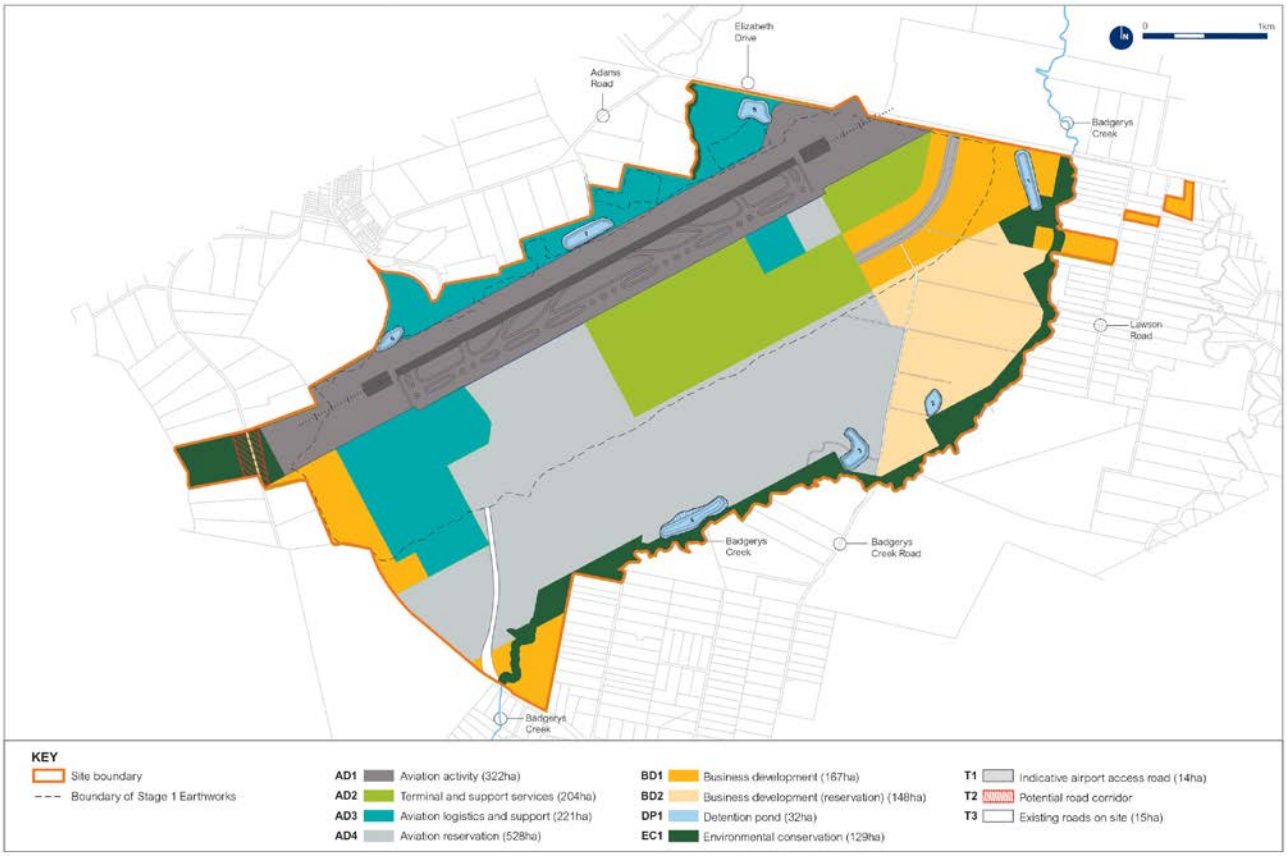


Figure ES 4 – Land use zones (Stage 1)

Part 3 of the Airport Plan provides details of the developments for which authorisation is being sought under the Airports Act. This part sets out the Australian Government's requirements for the proposed Stage 1 airport development. Any future work not covered by Part 3 of the Airport Plan, including the long term development, would be undertaken under the planning framework in Part 5 of the Airports Act as it applies to existing federally leased airports.

Determination of an Airport Plan would authorise the Stage 1 development encompassing the initial design, construction and operation of the proposed airport (that is, the activities described in Part 3 of the Airport Plan). The EIS provides a detailed consideration of likely environmental impacts arising from the Stage 1 development based upon the defined design and operational parameters described in the draft Airport Plan.

The EIS also provides a strategic level environmental assessment of a possible long term development of the proposed airport. This approach enables preliminary consideration of the extent of potential long term impacts (such as noise exposure) and, in particular, can help inform land use planning decisions in the vicinity of the airport site. Future developments would be subject to separate approval processes through master planning and major development plan requirements under the Airports Act.

Stage 1 Airport

The proposed Stage 1 development would include a 3,700 metre runway, positioned in the northern portion of the site on an approximate north-east/south-west or 50/230 degree orientation, as shown on Figure ES 5. The Stage 1 development also includes a single, full-length taxiway parallel to the runway, and a range of aviation support facilities including passenger terminals, cargo and maintenance areas, car parks and navigational aids.

The Stage 1 development is designed to be capable of facilitating the safe and efficient movement of up to 10 million domestic and international passengers per year, which is equivalent to approximately 63,000 air traffic movements annually, including freight movements, while also allowing sufficient space for future expansions.

The proposed airport would operate on a 24 hour basis. The draft Airport Plan would also set aside areas for a range of commercial uses (as set out in the land use plan) outside the airport terminal, such as retail and business parks. Any such commercial uses would be subject to separate consideration and approval requirements.

The Stage 1 development would encompass the entire 1780 hectare airport site. The majority of construction activity for Stage 1, including bulk earthworks and aviation infrastructure works would be restricted to a 1065 hectare Stage 1 construction impact zone, which is predominantly located in the northern portion of the site The existing terrain is made up of rolling hills and substantial earthworks, involving the relocation (on site) of around 22 million cubic metres of soils and rock, would be required to create a level surface to allow construction of the runway, taxiways and support services. There would also be some limited earthworks in the southern portion of the site during Stage 1, for the establishment of ancillary infrastructure including drainage swales and detention ponds as part of the water management system developed for the airport site.

The southern portion of the site would predominantly remain uncleared during the initial stage of airport development. This area is reserved for future development activities which, over the long term, could include construction of a second runway, and expansion of aviation uses and business development in accordance with the Airport Plan. Activities associated with these future uses do not form part of the Stage 1 development.

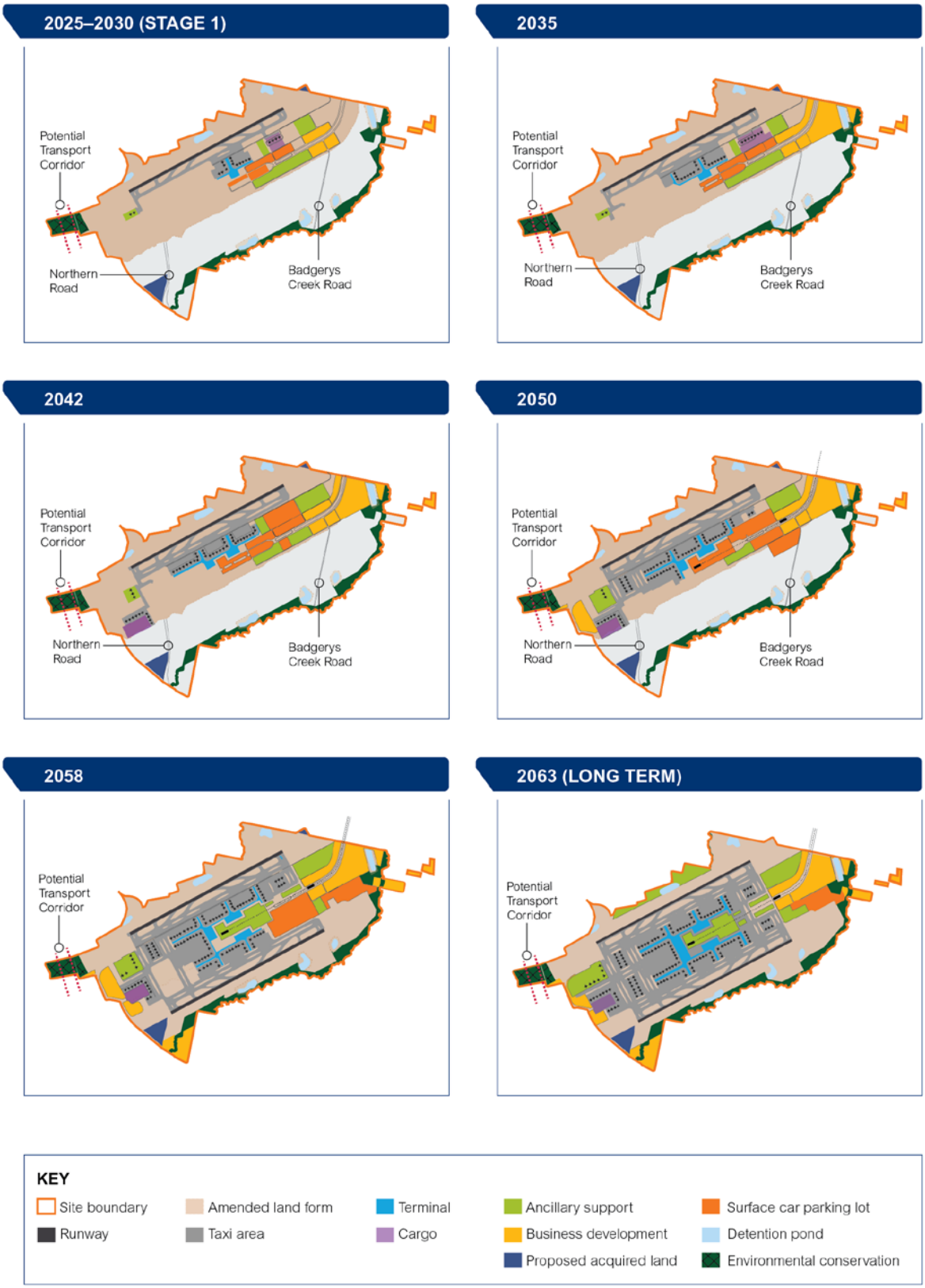


Figure ES 5 – Indicative Stage 1 development and long term concept designs

Long term development

It is expected that the proposed airport would be progressively developed as demand increases beyond 10 million passengers annually. Additional aviation infrastructure and support services such as taxiways, aprons, terminals and support facilities would be required to service the growing demand. Future developments beyond the scope of Stage 1 would be subject to the requirements of the Airports Act.

The need for a second runway would be triggered when the operational capacity approaches 37 million passengers annually, which is equivalent to approximately 185,000 air traffic movements per year. A second runway is forecast to be required by around 2050 and would be located parallel to the first runway with a centre line separation distance of approximately 1,900 metres.

The indicative long term airport concept considered in this draft EIS is forecast to service approximately 82 million passengers annually, which is equivalent to approximately 370,000 air traffic movements per year by about 2063. Indicative configurations for airport development beyond 2030 are provided in Table ES 1. The layout of the long term airport development will form part of subsequent master plans in accordance with the requirements of the Airports Act.

Operation of the airport and airspace design

Capacity and activity forecasts

Airservices Australia has assessed the airspace implications and air traffic management approaches for the Sydney region airspace associated with the development of the proposed airport. It is important for long term planning that the configuration of the airport site in Stage 1 does not preclude development in the long term. Therefore the airfield capacity analysis is based on the long term, parallel runway scenario.

This analysis indicates that an airport development at Badgerys Creek with parallel runway operations could achieve capacity for 103 total aircraft movements (landing and departing) per hour in the long term. This would comprise:

- 45 landing operations per hour; and
- 58 departure operations per hour.

The major functional areas of the airport such as terminal facilities, runways, taxiways and roadways would be designed to accommodate the peak hour passenger or peak hour aircraft demand. The peak hour activity represents the greatest level of demand being placed on facilities required to accommodate passenger and aircraft movements. Consideration of the peak hour activities during planning allows facilities to be sized appropriately so that they are neither underutilised nor overcrowded too often, and ensures that users consistently receive a satisfactory level of service and are not subject to significant congestion.

The Stage 1 and long term capacity requirements for the proposed airport, based on the indicative activity forecasts and the expected peak hour activity, are presented in Table ES 1. The Stage 1 airport layout would be designed so as not to preclude future works to accommodate expected long term capacity requirements.

Table ES 1 – Summary of activity forecasts

	Stage 1 (c. 2030)	First runway at capacity (c. 2050)	Long term (c 2063)
Annual passengers (arrivals and departures)	10 million	37 million	82 million
Peak hour passengers (international and domestic)	3,400	9,500	18,700
Total annual air traffic movements (passenger and freight)	63,000	185,000	370,000
Total peak hour air traffic movements	21	49	85

The volume and profile of passengers using the proposed airport is expected to evolve over time in response to growing demand and relative market position. It is expected that in the early years around 80 per cent of passenger demand at the proposed airport would involve regional and domestic travel. Domestic demand is likely to be focused on travel between capital cities, including Melbourne, Brisbane and Perth, as well as the Gold Coast.

Over time, it is expected that demand would grow, particularly in international passenger movements, as residual capacity at Sydney Airport is used. It is expected that the proposed airport could serve approximately two million annual international passengers by 2030, growing to approximately 18 million annual passengers by 2050. By this time, the domestic/ international split could be approximately 43 per cent domestic and 57 per cent international. In the long term, the proposed airport is expected to serve all types of aviation traffic including low cost carriers, full service carriers, international, domestic, connecting and regional traffic.

Freight aircraft are also expected to operate at the proposed airport, with the site able to accommodate approximately 7,000 dedicated freight air traffic movements in 2030, increasing to 30,000 air traffic movements in 2063.

Operating modes

Aircraft operations are controlled by air traffic control personnel and are based on a combination of meteorological conditions and airport operating policy. Aircraft are allocated to a runway, which determines both the physical runway to be used for take-off and landing and the direction in which that runway is to be used.

Wind conditions at the airport site may limit the times when particular runway orientations may be selected. However, an analysis of meteorological conditions at Badgerys Creek indicates that the preferred operating mode would be able to be selected over 80 percent of the time. Therefore there would be a substantial proportion of the time when the choice of runways would be determined by airport operating policy.

The design of the runways at the proposed airport has been developed around an optimal orientation of 50/230 degree (magnetic) heading as illustrated in Figure ES 6. This orientation is referred to as 05/23.

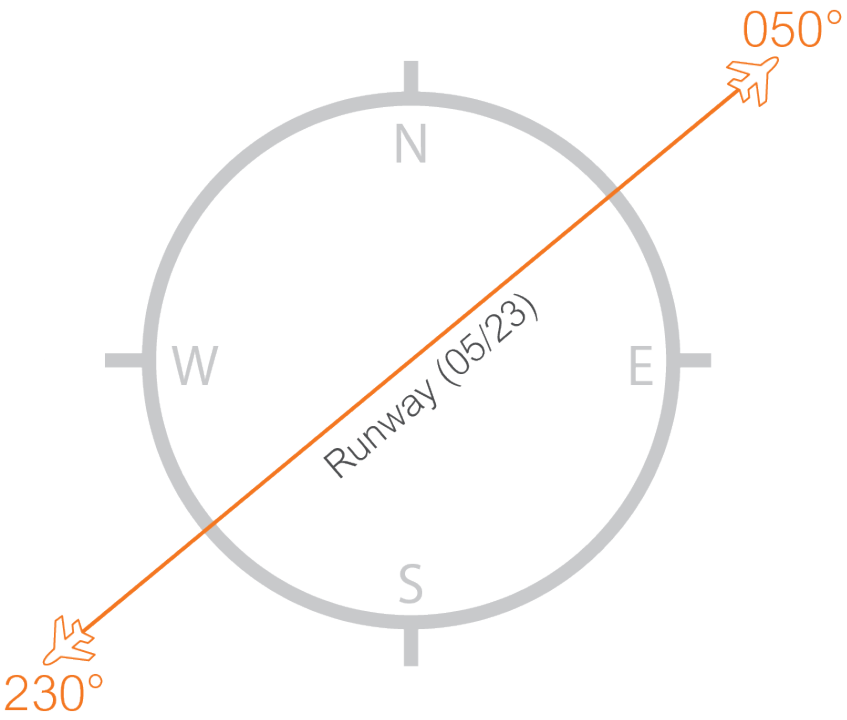


Figure ES 6 – Runway orientation

Based on the 05/23 runway orientation, for Stage 1 there are two main operating modes that would occur depending on meteorological conditions at different times including:

- '05' operations whereby aircraft would take off and land on the 05 orientation. Under this operating mode, all aircraft would be directed to approach the proposed airport to land from the south west and directed to take-off to the north east before redirecting towards their ultimate destination; and
- '23' operations whereby aircraft would take off and land on the 23 orientation. Under this operating mode, all aircraft would be directed to approach the proposed airport to land from the north east and directed to take-off to the south west before redirecting towards their ultimate destination.

The concept of 05 and 23 operations is illustrated in Figure ES 7. Under each of these operating modes, when the non-preferred operating direction is used for a period of time, operations would be switched back to the preferred direction when it became available after a time lag.

A third operating mode, 'Head to Head' may be feasible following further detailed assessment before the start of operations. This would involve all landings and take off movements occurring in opposing directions, either to or from the south west; or to or from the north east. Under this mode all aircraft operations would occur only on one side of the airport site, thus offering a period of respite from aircraft operations for other areas while this mode was in operation.

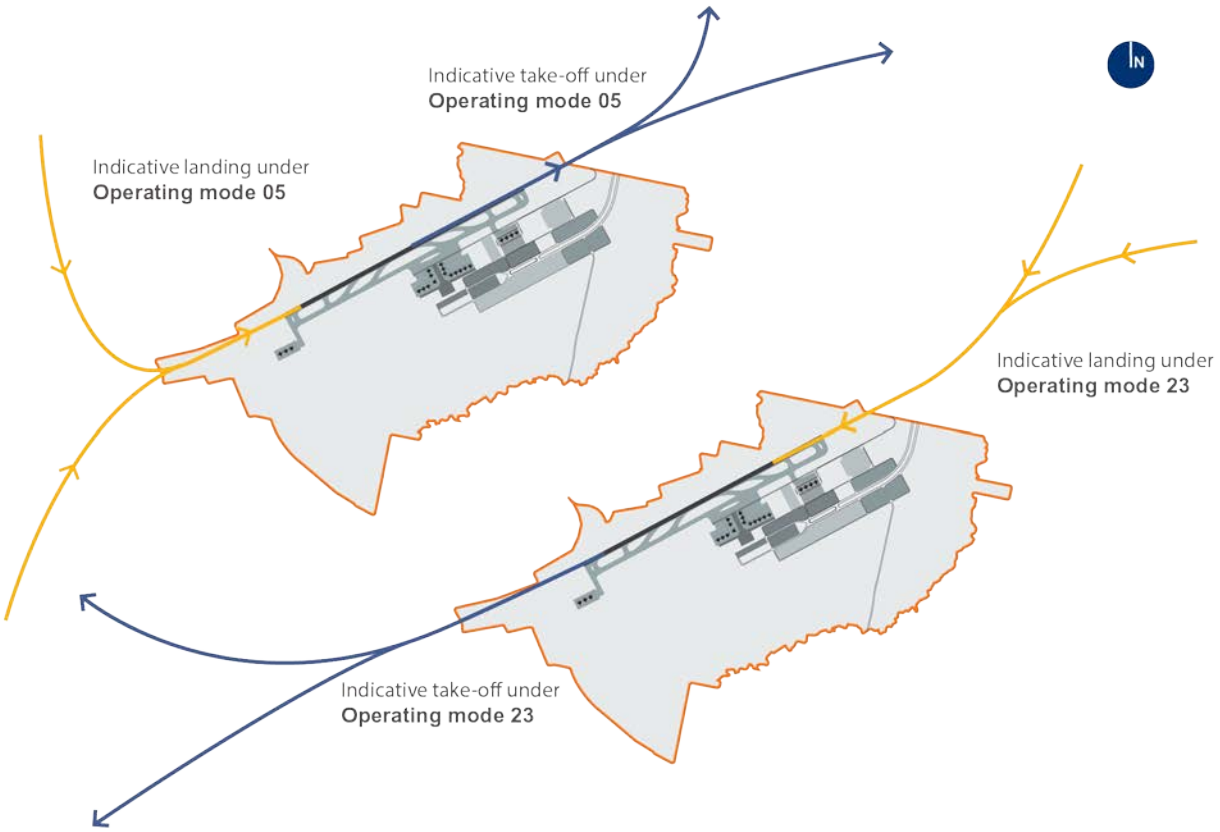


Figure ES 7 – '05' and '23' operating modes

Airspace architecture

Airservices Australia has undertaken a preliminary assessment of the implications for airspace and air traffic management arrangements in the Sydney region associated with the introduction of flights to and from the proposed airport.

Because the operation of the Stage 1 development is potentially more than 10 years away (and construction for the long term development potentially more than 40 years away), the preliminary assessment undertaken by Airservices Australia is limited to a conceptual level airspace management design.

The principal objective of the preliminary assessment was to establish whether safe and efficient operations could be introduced at the proposed airport through the development of indicative proof-of-concept air traffic management designs.

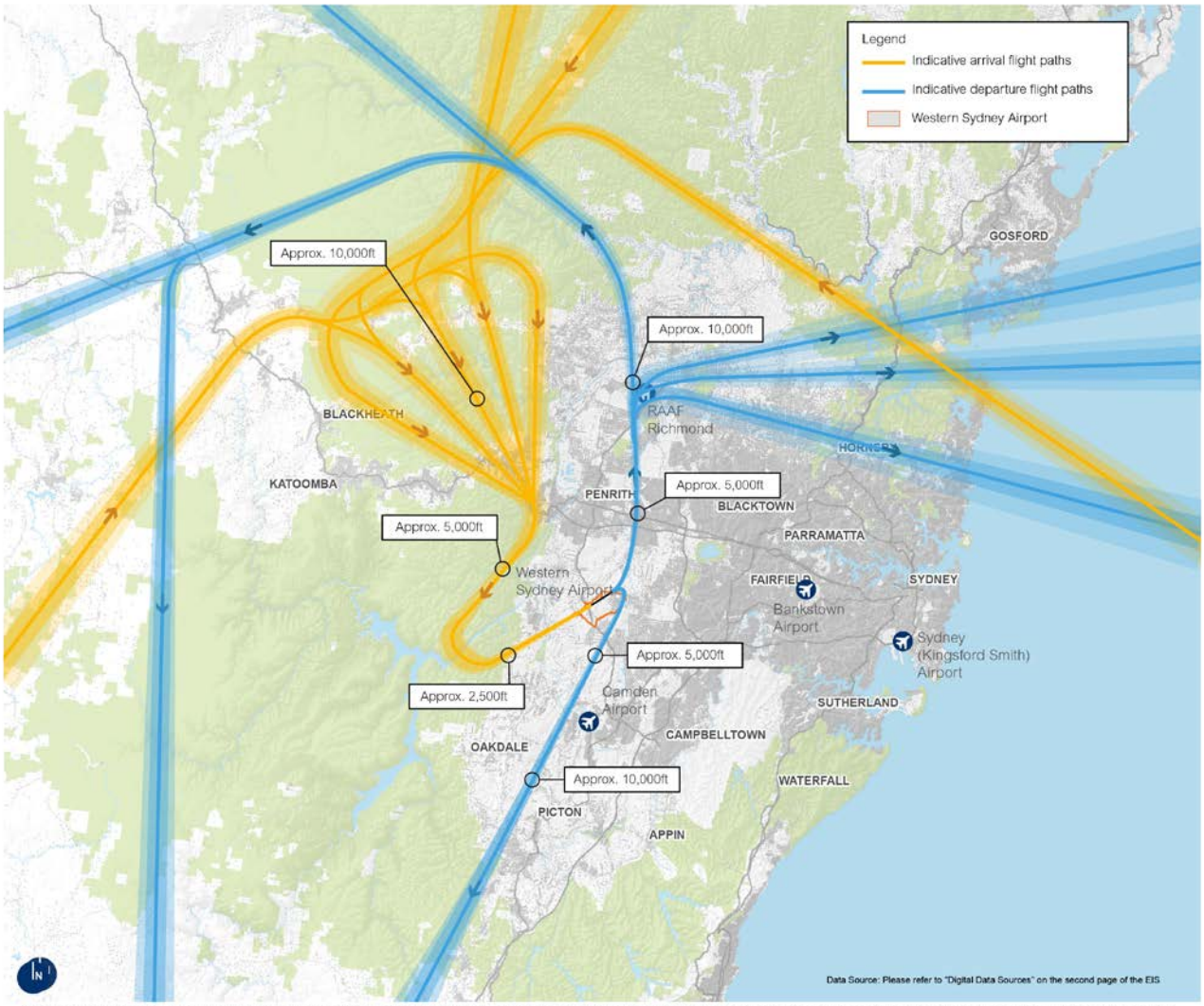
For this draft EIS, it is important to acknowledge that the proof-of-concept air traffic management design by Airservices Australia does not take into account other influences on air traffic movement such as consideration of noise impacts. These factors would be incorporated into the final design of the airspace, which would also be subject to community and industry consultation and may engage further environmental assessment processes. In the meantime, this draft EIS provides an assessment of noise and other impacts based on the preliminary design information currently available and indicative flight paths provided by Airservices Australia.

The indicative flight path concept designs for approach and departure routes demonstrate that Stage 1 of the proposed Western Sydney Airport and Sydney Airport could safely operate independently as high capacity airports. Figure ES 8 and Figure ES 9 present flight paths for both the 05 and 23 directions. This demonstrates that an airspace design could be implemented for a single runway operation at the proposed airport without making significant change to the current design and flight path structure for Sydney Airport or Bankstown Airport. However, as demand for aviation services grows beyond that expected for Stage 1, instrument flight rule operations at Bankstown Airport are expected to be incrementally constrained. This is because aircraft arriving into the proposed airport on runway 23 and aircraft arriving at Bankstown Airport on runway 11 would operate on overlapping flight paths and would need to be sequenced between the two airports.

The operation of parallel runways at the proposed airport would also be viable in the long term. With parallel runways, the proposed airport could potentially achieve aircraft movement rates of around 100 movements per hour (one landing or one arrival constitutes an aircraft movement), with Sydney Airport maintaining a movement rate of 80 per hour. Preliminary analysis suggests that the following issues would need to be assessed in detail as part of the future airspace design process undertaken closer to the commencement of operations at the proposed airport:

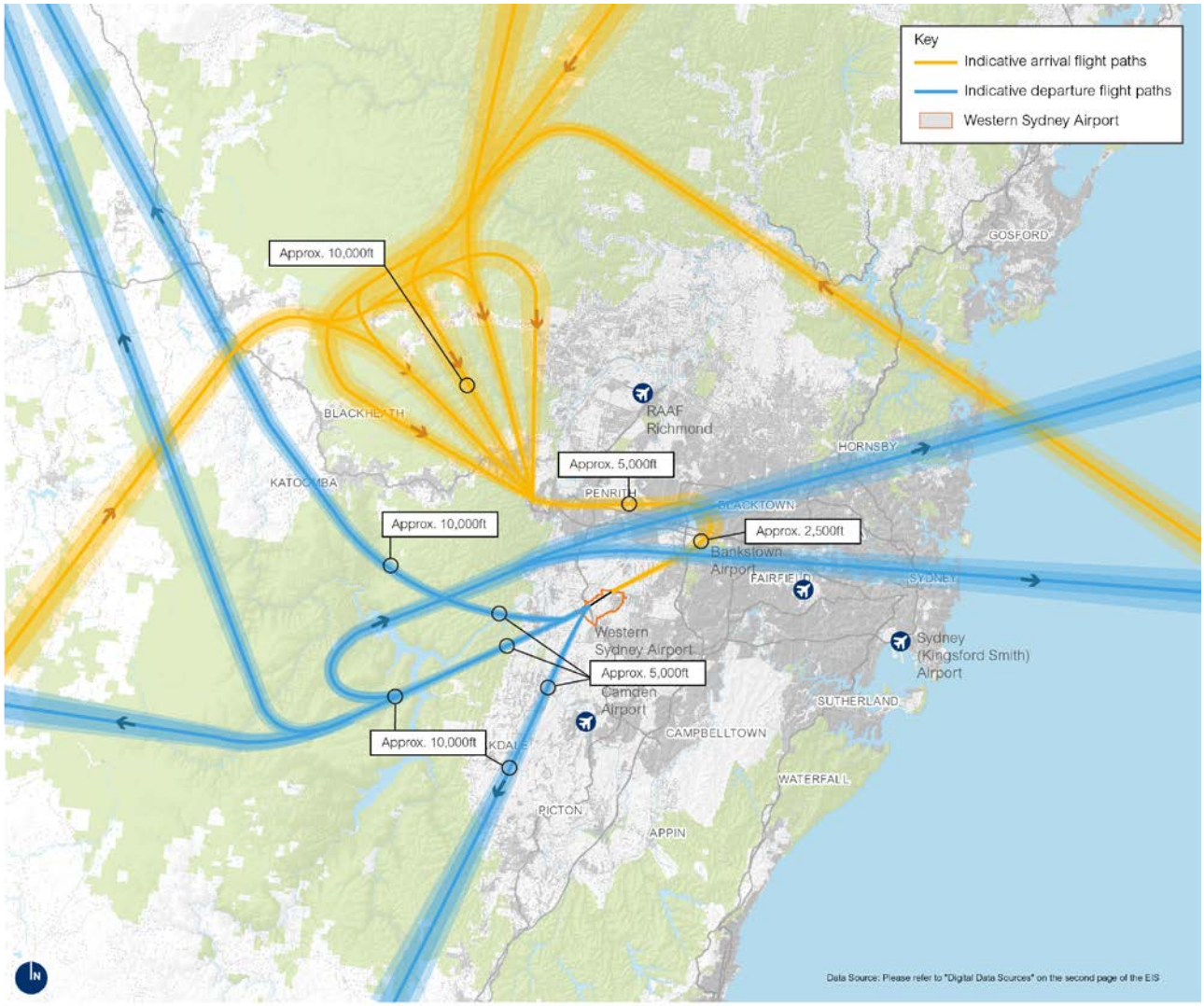
- changes to Sydney Airport flight paths to maintain independent operations at the proposed airport and Sydney Airport, and to achieve the expected demand capacity;
- changes to flight paths serving Bankstown Airport, in particular instrument flight rule operations, in order to maintain independent operations at the proposed airport and Bankstown Airport, and to achieve the expected demand capacity;
- further consideration of existing activity that occurs in the Sydney region, such as minimising the potential impact on local training areas where possible;
- resolution of a potential constraint associated with the restricted airspace area over the Defence Establishment Orchard Hills; and
- further consideration of noise and visual sensitive receivers, such as residential areas and the Greater Blue Mountains World Heritage Area.

Decisions about airspace management above and around the proposed airport, including the determination of flight paths, would be made by Airservices Australia and the Civil Aviation Safety Authority (CASA) closer to the start of airport operations. These decisions could require further environmental assessment processes, community and stakeholder engagement, and may be the subject of a future referral under the EPBC Act following detailed design.



Note: Indicative flight paths are based on Airservices Australia's Western Sydney Airport: Preliminary Airspace Management Analysis. It does not present a comprehensive airspace and air route design and does not consider many essential components that would be necessary to implement an air traffic management plan for the Sydney basin. The formal flight path design for the Airport will be undertaken much closer to the commencement of operations.

Figure ES 8 – Indicative flight paths for the 05 operating mode



Note: Indicative flight paths are based on Airservices Australia's Western Sydney Airport: Preliminary Airspace Management Analysis. It does not present a comprehensive airspace and air route design and does not consider many essential components that would be necessary to implement an air traffic management plan for the Sydney basin. The formal flight path design for the Airport will be undertaken much closer to the commencement of operations.

Figure ES 9 – Indicative flight paths for the 23 operating mode

Community consultation

The Australian Government has committed to providing multiple opportunities for the community to provide feedback on the proposed airport. In addition to consultation undertaken throughout 2015, the Australian Government has conducted research into community and stakeholder views on the project.

The stakeholder and community consultation activities undertaken during the preparation of the draft EIS have assisted in informing the issues addressed in the draft EIS. The principles for the engagement process were guided by the Core Values and Code of Ethics of the International Association for Public Participation.

Feedback received from the community and stakeholders and how this was addressed in the draft EIS and draft Airport Plan is discussed in Chapter 8. A summary of typical questions is provided below.

Typical questions from the community are:

- Will the proposed airport operate 24 hours per day?
- What will be the location of the flight paths over Western Sydney?
- How high will the aircraft be?
- How will the proposed airport impact The Northern Road?
- What will happen to the current rural lifestyle?
- How will public transport connect to the airport?
- Will local roads be upgraded as part of the Western Sydney Airport project?
- Will there be an impact on property prices in the region?
- Will the cumulative impacts of the proposed airport and surrounding projects be evaluated?
- When will construction and operation begin?
- What new jobs will be available in Western Sydney?
- Is there a real benefit of having an airport in Western Sydney?
- Is there the potential for increased tourism in the Blue Mountains region?

Issues raised during the preparation of the EIS include:

- the changing face of Western Sydney;
- proposed flight paths and noise impacts;
- potential for increased pollution levels in Western Sydney;
- impacts of the Western Sydney Infrastructure Plan;
- local traffic and transport changes;
- employment opportunities from the proposed airport; and
- operational issues.

The suite of planned consultation activities to take place during the public exhibition period for the draft EIS and draft Airport Plan has been designed to reach the broader Western Sydney community. Events such as local drop-in information sessions, community market pop up stalls, static displays at local libraries and an online noise modelling tool, as well as printed material including summary documents, fact sheets, newsletters and other relevant documentation, would all be used to ensure the community has access to as much information as possible.

Draft EIS process

The Department submitted a referral under the EPBC Act for the development of the airport on 4 December 2014. On 23 December 2014, a delegate of the Minister for the Environment determined the proposed airport to be a 'controlled action'. The referral decision instrument identifies the following controlling provisions under the EPBC Act as being relevant to this proposal:

- world heritage properties (sections 12 and 15A);
- national heritage places (sections 15B and 15C);
- listed threatened species and communities (sections 18 and 18A); and
- Commonwealth action (section 28).

At the same time, the delegate decided that the proposed airport development would be assessed by preparation of an EIS. The *Guidelines for the Content of a Draft Environmental Impact Statement – Western Sydney Airport* (EIS guidelines) were issued on 29 January 2015.

This draft EIS addresses the guidelines by assessing the potential environmental, social and economic impacts associated with the Stage 1 development as described in Part 3 of the draft Airport Plan. The intent and objectives of the New South Wales legislative framework and assessment guidelines were also considered, where appropriate, for each environmental value. The draft EIS also considers the potential impacts over the long term, by providing a separate strategic level environmental impact assessment.

The framework for the impact assessment has been designed to provide a structured and objective approach to identifying the proposed airport's environmental, social and economic impacts, and to developing effective mitigation, management and offset measures. The approach has generally involved:

- project definition including analysis of the need and alternatives to address the growing aviation demand in the Sydney region;
- identification of key issues through reviewing previous investigations, preparation of an EPBC Act referral and a gap analysis and risk assessment process;
- identifying existing environmental, social and economic baseline conditions;
- completion of impact assessments for the project based on the broad parameters presented in the draft Airport Plan, having regard to the baseline conditions;
- refinement of the project having regard to the impact assessments; and

- identification of appropriate mitigation, management, monitoring measures and (where appropriate) offset measures for the identified potential impacts.

The baseline (or existing environment) conditions for the airport site and surrounding locality were derived using a combination of desktop and field investigations relevant to each environmental aspect or value. Where possible, the investigations built on previous studies that have been completed at the airport site.

Mitigation and management measures were applied to reduce the level of identified potential impacts. These measures aim to protect the identified environmental values and would be applied as required during the planning and design, construction and operation phases of the project.

The following sections present a summary of each issue assessed in the draft EIS.

Aircraft noise

Operation of the Stage 1 development would result in changes to the pattern of aircraft movements in the airspace above Western Sydney. These changes are expected to result in impacts during both the day and night, particularly in communities immediately surrounding the airport site.

The pattern of noise impacts that would result from operation is complex and depends on the time of day or night, season, airport operating mode and other factors. The availability of each operating mode at any given time would depend on meteorological conditions, particularly wind direction and speed, the number of presenting aircraft and the time of day. A number of operational strategies were developed based upon the preferred direction for landing and take-off when weather and operating conditions permit use. Operating strategies include Prefer 05, Prefer 23 and head to head operations at night in combination with the preferred daytime direction.

It is expected that land use and planning around the proposed airport would be influenced by the Australian Noise Exposure Concept (ANEC) contours presented in this EIS, which would be used to define the development of Australian Noise Exposure Forecast (ANEF) contours once flight paths and operating modes are finalised and approved. The ANEF system is intended for use as a land use planning tool for controlling encroachment on airports by noise sensitive buildings. The system underpins AS2021 *Acoustics- Aircraft noise intrusion- Building siting and construction*, which contains advice on the acceptability of building sites based on ANEF zones. The acceptability criteria vary depending on the type of land use, with an aircraft noise exposure level of less than 20 ANEF considered acceptable for the building of new residential dwellings.

Land use planning controls based on the ANEC developed for the 1985 EIS (Kinhill Stearns 1985) have been adopted by councils surrounding the airport site to generally control the type and nature of development in the vicinity of the proposed airport site. ANEC contours have been calculated for the proposed operation of the Stage 1 development as shown on Figure ES 10 and Figure ES 11 are generally less geographically extensive than those developed for the 1985 Draft EIS.

It is important to note that the ANEC figures for the proposed Stage 1 development are for comparative purposes and any change to current land use planning instruments would necessarily be based on long term forecasts of noise exposure.

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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

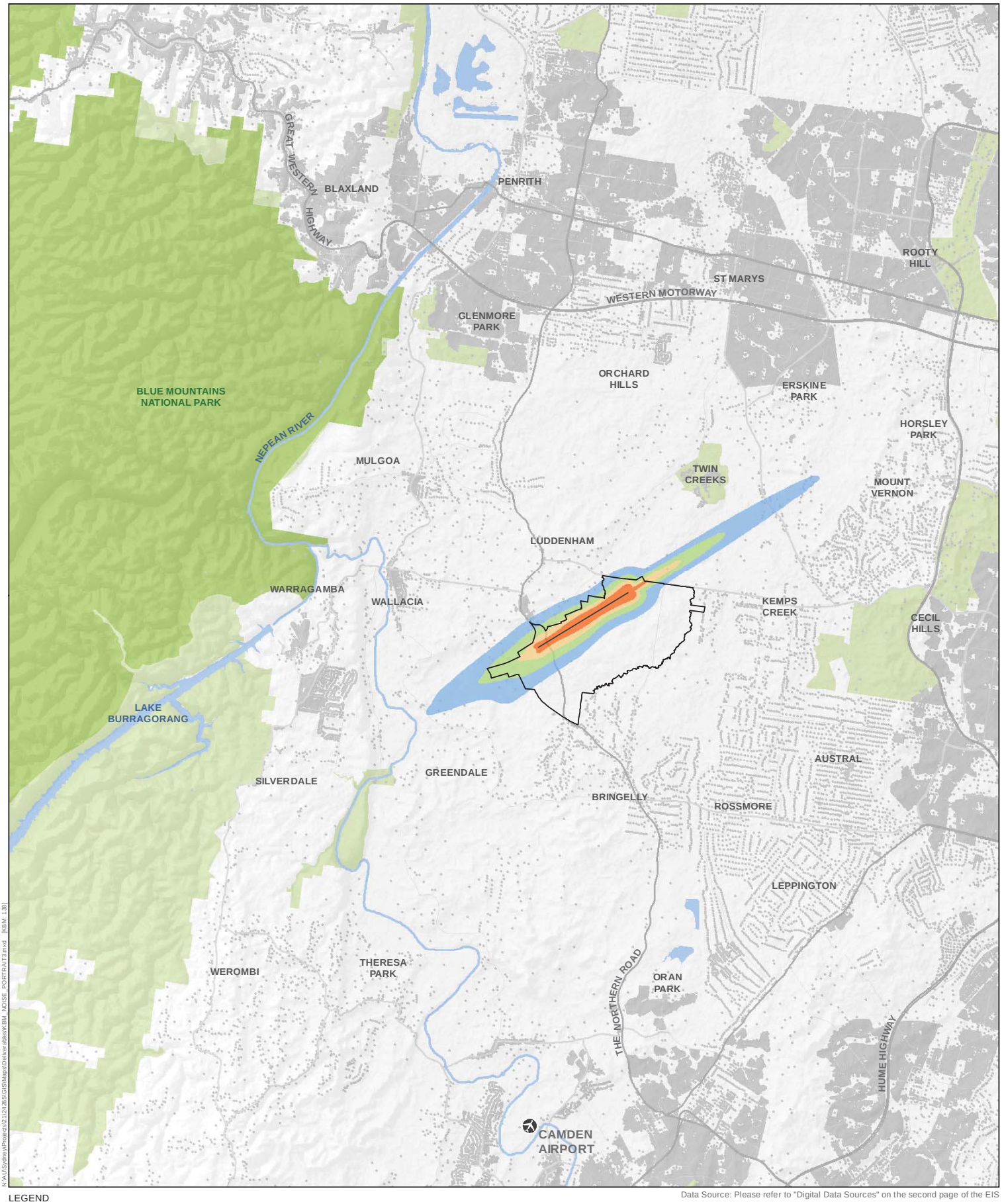
LEGEND

- Western Sydney Airport
- Runway
- Airfields
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves
- ANEC = 20-25
- ANEC = 25-30
- ANEC = 30-35
- ANEC = 35+

0 1 2 4
Kilometres

N

ES10 - ANEC contours for Prefer 05 operating strategy (2030)



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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Western Sydney Airport
- Runway
- Airfields
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves
- ANEC = 20-25
- ANEC = 25-30
- ANEC = 30-35
- ANEC = 35+

ES11 - ANEC contours for Prefer 23 operating strategy (2030)

0 1 2 4
Kilometres

N

Maximum noise levels of 70 to 75 dBA (where a person may need to raise their voice to be properly heard in conversation) can be expected within built-up areas in St Marys and Erskine Park. The maximum noise levels would result from long-range departures by Boeing 747 or equivalent aircraft. Maximum noise levels due to more common aircraft types such as the Airbus A320 or equivalent are predicted to be between 60 to 70 dBA in St Marys and Erskine Park and over 70 dBA in some adjacent areas to the south west of the proposed airport, notably Greendale and Luddenham. Around 1,500 people would experience five or more aircraft noise events per day above 70 dBA. None of these receivers would be in built-up residential areas.

At night the Prefer 05 operating strategy (typically approaching and departing the proposed airport in a south-west to north-east direction) would result in an estimated 48,000 people experiencing more than five events above 60 dBA. This is reduced to approximately 6,000 people with the prefer 23 operating strategy (with arrivals and departures in the opposite direction), or 4,000 people if a head to head operations (both approach and depart to the south west) is implemented.

Figure ES 12 and Figure ES 13 presents the maximum extent noise contours for the arrival and departure of an Airbus A320 which is expected to be one of the more common types of aircraft used at the proposed airport.

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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Western Sydney Airport
- Runway
- Airfields
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves

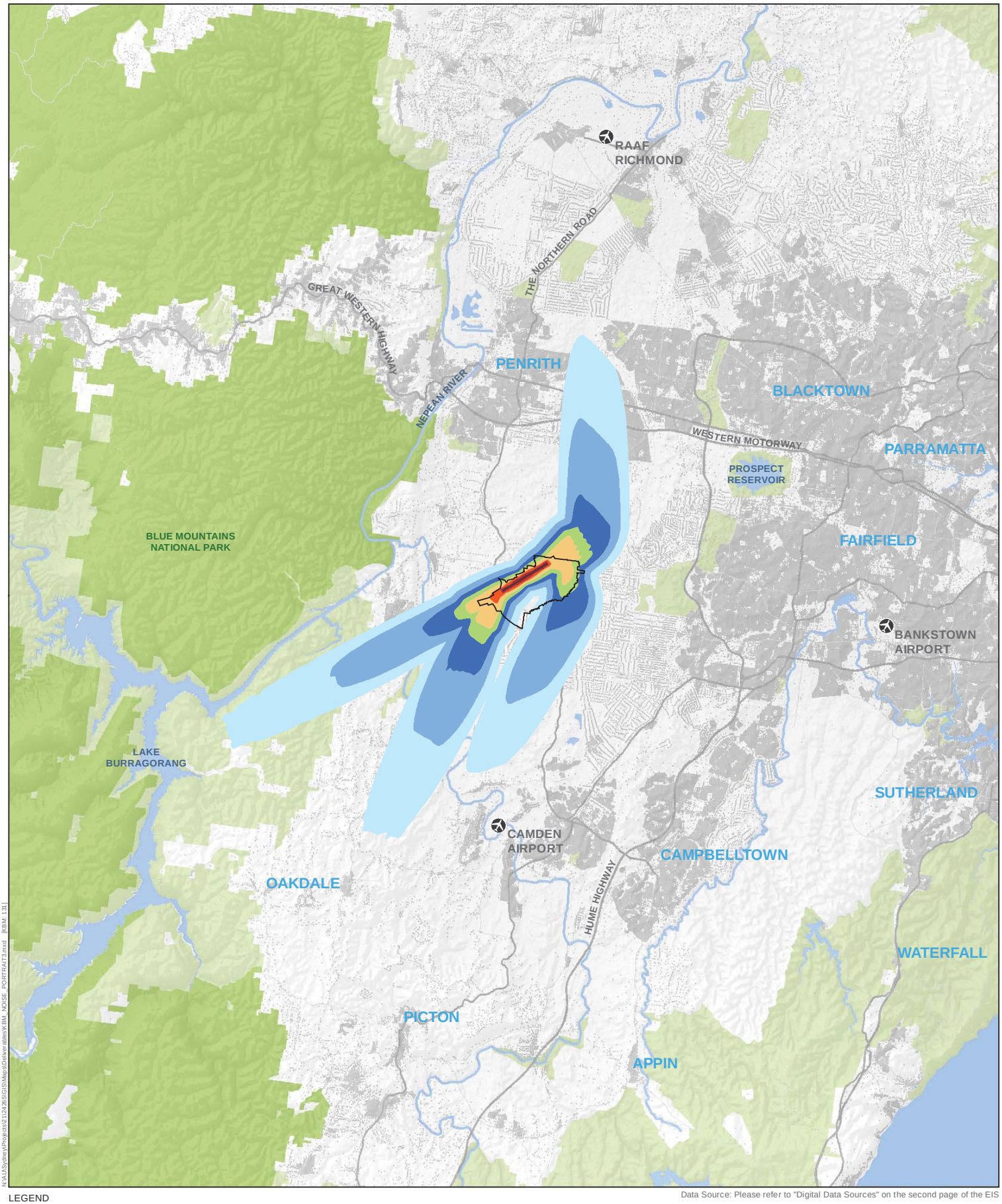
LAmax

- 60-65 dBA
- 65-70 dBA
- 70-75 dBA
- 75-80 dBA
- 80-85 dBA
- >85 dBA

0 2.25 4.5 9
Kilometres

N

ES 12 - Single event noise level for an A320 arrival



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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Western Sydney Airport
- Runway
- Airfields
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves

LAmax

- 60-65 dBA
- 65-70 dBA
- 70-75 dBA
- 75-80 dBA
- 80-85 dBA
- 85-90 dBA
- >90 dBA

0 2.25 4.5 9
Kilometres

N

ES 13 - Single event noise level for an A320 departure

A number of recreational areas located close to the airport site, have been identified within the area potentially affected by aircraft overflight noise. These range from sports areas used for active pursuits such as horse riding, bowling or golf to nature reserves which may be used for more passive activities.

The results indicate that most of the identified recreational areas would not be subject to aircraft overflight noise events with maximum levels exceeding 70 dBA, or their exposure would be less than one event per day on average. Aircraft overflight noise levels at Twin Creeks Golf and Country Club would be noticeable and at times a raised voice would be required for effective communication. At this location, predicted noise exposure would be significantly reduced under a Prefer 23 operating strategy.

Bents Basin State Conservation Reserve and Gulguer Nature Reserve would be subject to a number of events with noise levels exceeding 60 dBA, which would be noticeable to passive users of these areas.

The responsibility for managing noise impacts at the proposed airport would be shared by many organisations. These include the ALC, the Australian, NSW and local governments, airlines, aircraft and engine manufacturers, and regulators. Approaches to mitigating aircraft overflight noise generally focus on reducing noise emissions from the aircraft themselves, planning flight paths and airport operating modes in a way that minimises potential noise and environmental impacts, and the implementation of land use planning or other controls to ensure that future noise-sensitive uses are not located in noise-affected areas. Potential noise abatement opportunities such as the selection of operating modes would form a major part of the work required to finalise the airspace design.

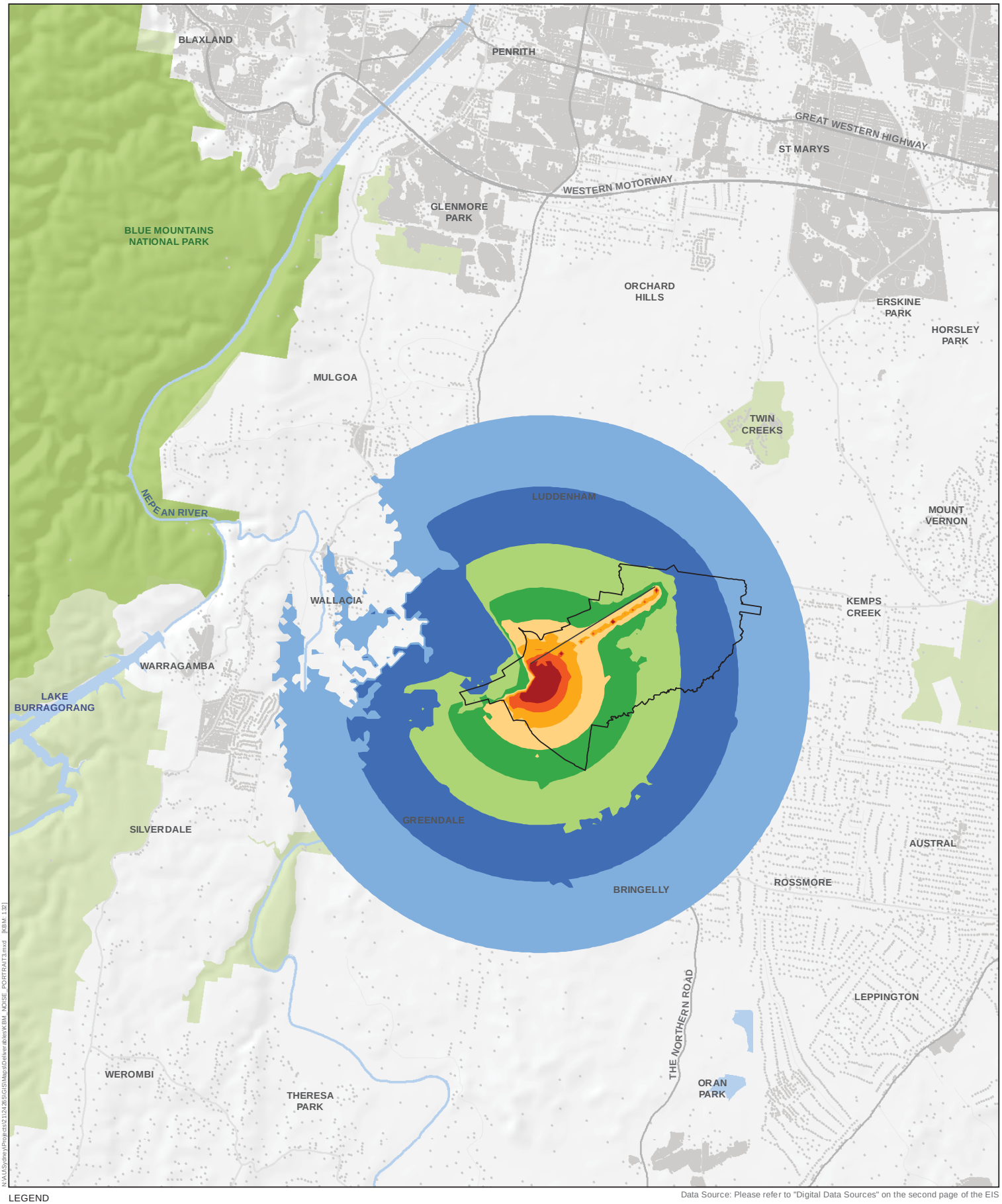
Ground-based noise

Ground-based noise includes noise generated from aircraft taxiing and the ground running of aircraft engines for maintenance testing. Ground-based noise would also include noise associated with the construction of the proposed airport and road traffic associated with the operational airport.

Existing noise sources in the area around the airport site include road traffic noise and industry, reflecting the surrounding land uses. The construction and operation of the proposed airport would introduce new noise sources into the area.

Noise during the construction of the proposed airport would be largely contained within the airport site, although there would be impacts on the Luddenham and Badgerys Creek areas. While heavy and light vehicles would need to access the airport during the construction stage, the increase in traffic noise as a result would not be significant. Vibration generated by construction activities is considered unlikely to cause building damage.

Ground-based operational noise would be generated by aircraft engine run-up and taxiing. The impact of noise from a nominal engine run-up site in the south west of the airport site would extend the furthest from the site boundary, while taxiing would extend over a much smaller area and would primarily affect Luddenham. Noise at these locations may be above the noise criteria adopted for this assessment under worst case meteorological conditions (i.e a ground-based temperature inversion) and depending on existing noise levels in the area at the time. The predicted worst case extent of noise contours (L_{Amax}) associated with engine run up and taxiing are presented in Figure ES 14 and Figure ES 15.



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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Western Sydney Airport
- Runway
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves

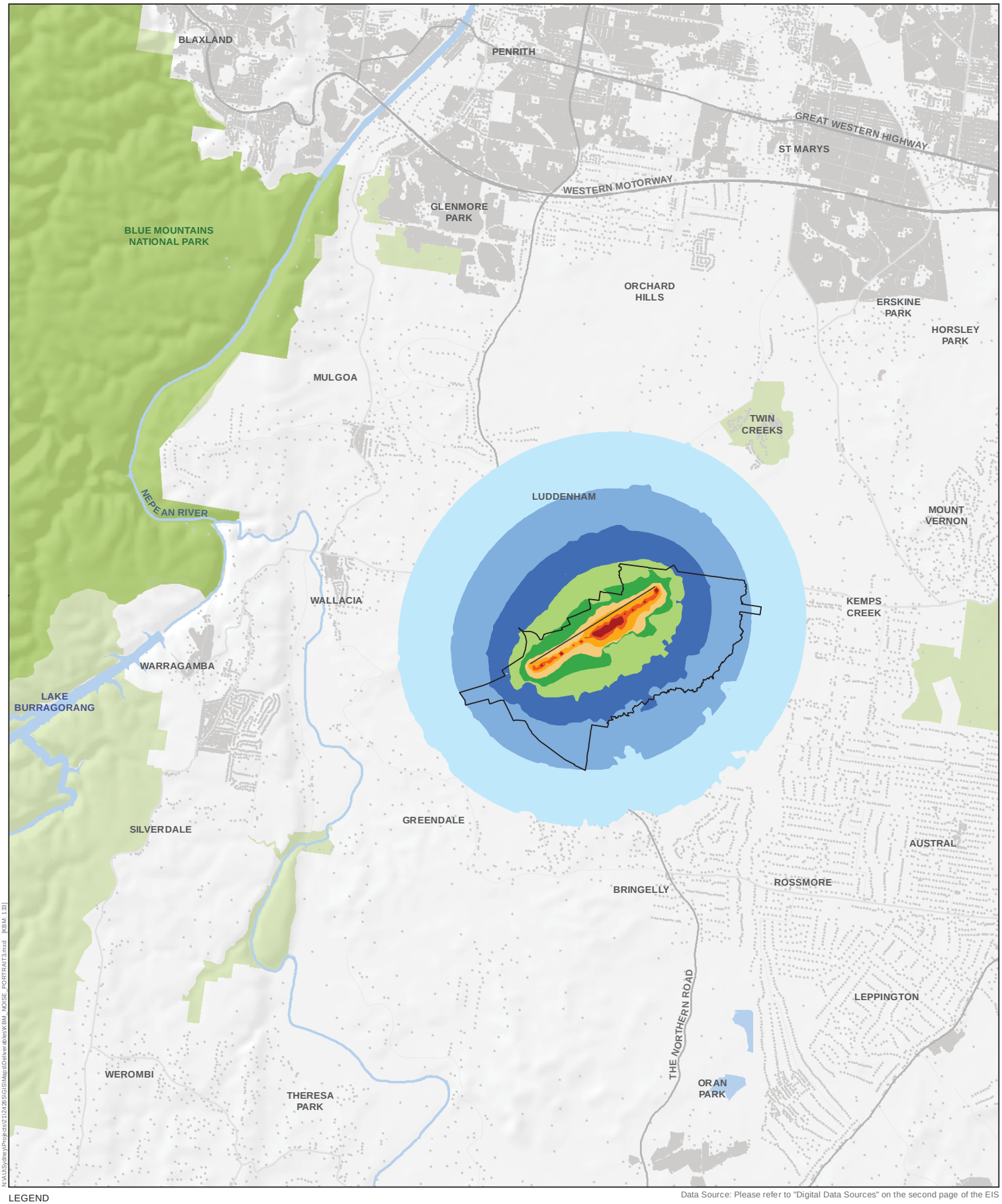
LAeq, 15min

- 45-50 dBA
- 50-55 dBA
- 55-60 dBA
- 60-65 dBA
- 65-70 dBA
- 70-75 dBA
- 75-80 dBA
- >80 dBA

0 0.75 1.5 3
Kilometres

N

ES 14 - Worst case engine ground run noise contours (2030)



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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Western Sydney Airport
- Runway
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves

LAeq, 15min

- 40-45 dBA
- 45-50 dBA
- 50-55 dBA
- 55-60 dBA
- 60-65 dBA
- 65-70 dBA
- 70-75 dBA
- 75-80 dBA
- >80 dBA

0 0.75 1.5 3
Kilometres

N

ES 15 - Worst case taxiing noise contours (2030)

During operation of the proposed airport, noise level increases in the surrounding area due to airport generated road traffic are not expected to be significant.

Mitigation measures have been proposed to address noise during construction and operation of the proposed airport. However, further design work is required to evaluate mitigation measures from the engine run-up facility. Mitigation measures include the implementation of a construction noise and vibration management plan and the development of a strategy to manage ground-based noise during operation.

As noise from the operation of the airport would affect neighbouring communities at levels above the adopted noise assessment criteria further consideration of this impact is required. A ground-based noise amelioration strategy would be developed that identifies reasonable and feasible noise mitigation measures. The strategy would include:

- engagement with occupants of affected residences and other facilities regarding potential noise impacts and amelioration measures;
- a detailed noise amelioration plan that identifies noise criteria for affected residences and other sensitive receivers surrounding the airport site and any reasonable and feasible noise mitigation measures;
- similar to other airports, implementation of aircraft ground running operating procedures including investigations of feasible measures to reduce noise impacts;
- noise modelling to examine the effectiveness of any proposed noise amelioration measures;
- other specific measures to address noise exceedances where physical noise mitigation is ineffective; and
- a noise monitoring plan.

Air quality and greenhouse gases

The air quality and greenhouse gas assessment included a review of climatic data obtained from the airport site and an analysis of ambient air quality from data collected from monitoring stations in the vicinity of the airport site. Air quality impacts associated with the construction of the proposed airport (particularly construction dust) were modelled, as were emissions and air pollution associated with the operation of the proposed airport. Other air quality parameters that were assessed included odour (from aircraft exhaust and the on-site wastewater treatment plant), regional air quality impacts (ozone) and greenhouse gas emissions.

Construction would result in dust emissions generated during both the bulk earthworks and the aviation infrastructure works. The asphalt batching plant would also generate some odour during construction. The results of the air dispersion modelling show that the predicted dust impacts during construction would be below the air quality assessment criteria at all sensitive residential receptors. Levels of odour from the asphalt plant would also be below the relevant criteria at all sensitive residential receptors and would be largely contained within the airport site.

Operation of the proposed Stage 1 development would result in an increase in emissions of nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), sulphur dioxide (SO_2) and air toxics. There would also be odour emissions from exhaust and from the on-site wastewater treatment plant. The highest off-site concentrations of the air quality metrics evaluated were generally predicted to occur at the receptors located to the north and north-east of the proposed airport.

Airport traffic on surrounding road infrastructure was found to be a significant contributor to predicted off-site ground level concentrations, particularly for those receptors located close to proposed roadways. Despite this, there were almost no predicted exceedances of the air quality assessment criteria at any of the sensitive residential receptors investigated as part of the assessment of the Stage 1 development. The exception was the 99.9th percentile one-hour maximum for formaldehyde, which showed one exceedance at an on-site receptor. Predicted off-site odour concentrations were below odour detection limits for both aircraft exhaust emissions and odours from the on-site wastewater treatment plant.

Only marginal ozone impacts would result from the operation of the Stage 1 development. These emissions would be managed using best available techniques and/or emission offsets.

Greenhouse gas emissions from the Stage 1 development have been estimated to comprise 0.13 Mt CO_2-e/annum, with the majority of emissions associated with purchased electricity. The Scope 1 and Scope 2 greenhouse gas emissions estimated from the proposed Stage 1 development would represent approximately 0.10 per cent of Australia's projected 2030 transport-related greenhouse gas emission inventory. For this reason, it can be concluded the greenhouse gas emissions from the proposed airport would not be material in terms of the national inventory.

Mitigation and management measures would be implemented to reduce potential air quality impacts during both construction and operation of the Stage 1 development. In particular, a dust management plan would be developed and implemented to address potential impacts from dust generated during construction. Air quality monitoring would also be undertaken at the airport site during operations. Although greenhouse gas emissions from the proposed airport would not be material in terms of the national inventory, a number of mitigation measures would be implemented during operations to reduce these emissions.

Human health

The health risk assessment considered the risks associated with construction and operation of Stage 1 of the proposed airport on the health of the local community. The assessment focuses on the potential health risks from air, noise, and surface and groundwater pollutant exposure through a comparison with the baseline (existing) situation. These pathways were identified as the likely primary means of potential impact to human health from the development of the proposed airport. The health impact assessment considers impacts from atmospheric particulates, nitrogen dioxide, sulphur dioxide, air toxics (benzene, toluene, xylenes and formaldehydes), diesel, and ozone. Water contaminants considered include petroleum hydrocarbons, heavy metals, polyaromatic hydrocarbons, chlorinated hydrocarbons and perflourinated compounds.

The air quality health risk assessment found that:

- The likely levels of airborne particulates generated by construction would be low overall and within the National Environment Protection Measure (NEPM) Advisory Reporting Standards. The highest concentrations are predicted at Badgerys Creek, Greendale and Rossmore.
- Levels of health risk as a result of exposure to diesel during construction would be within levels considered acceptable by regulatory agencies and the risks from particulate exposure during airport operation would be very low with the highest risk for all-cause mortality and cardiopulmonary mortality between one additional death every 1,000 years and six additional deaths every 100 years.
- Exposure to nitrogen dioxide would be the highest risk category resulting from airport operation, with between six additional deaths every 100 years and six additional deaths every 10 years in people over 30 years of age. If traffic on roads external to the airport is excluded, this risk would reduce to four additional deaths every 10 years.
- Exposure to sulphur dioxide from the airport operations would be very low. The highest risk is for hospital admissions from respiratory causes with approximately three additional admissions per 1,000 years.
- The health risk arising from exposure to carbon monoxide would be negligible. The highest risk is for hospital admissions for cardiovascular disease in people 65 years of age and older with a maximum of five additional hospital admissions in 1,000 years.
- The risk from exposure to benzene during airport operations would result in a very small increase in health risk which is within levels considered acceptable by regulatory agencies.

The noise health risk assessment found that airport operations would lead to an increase in sleep disturbance (assessed as awakenings), increases in risk of cardiovascular disease and delays in childhood learning and cognitive development. These effects are predicted for suburbs close to the airport site, in particular Luddenham. Further work would be undertaken to identify feasible mitigation measures that would reduce these impacts.

While there are potential risks to surface and groundwater resources from construction and operation of the airport site, most of these are not specific to airport developments and a range of standard industry design and precautionary measures would be implemented to reduce these risks. It is considered unlikely that emergency fuel jettisoning would result in impacts to surface water bodies including potable water storages given the rarity of its occurrence and restrictions on where it can be undertaken.

Hazards and risks

A number of hazards and risks may arise from the construction and operation of the proposed airport. These hazards and risks are divided into those associated with airspace operations and those associated with ground-based operations. Hazards and risks associated with airspace operations include bird and bat strike, airspace obstruction, aircraft collisions, adverse meteorology, aircraft crashes and terrorism incidents. Those associated with ground-based operations include fire, flooding, contamination of land and dangerous goods transport. These hazards and risks are not unique to the proposed airport.

Many aspects of the airport design are preliminary and a number of important airspace considerations will only be resolved closer to the commencement of operations. Certification of the aerodrome by the Civil Aviation Safety Authority would be required before operations can commence, as well as implementation of the requirements of the existing regulatory framework. Satisfying these regulatory requirements will necessitate detailed design studies.

Based on the design information currently available, no insurmountable risks associated with the Stage 1 airport development are considered likely. Key issues that need to be finalised prior to the operation of the proposed airport include:

- resolution of aspects of jet fuel storage;
- identification and/or reservation of a pipeline corridor to secure future fuel supply by means other than road transport (in conjunction with NSW Department of Planning and Environment);
- additional bird and bat surveys to confirm the preliminary risk identified;
- completion of a study to identify stack emissions in the proposed airspace; and
- implementation of appropriate development controls on public safety zones outside of Commonwealth owned land.

Before the start of airport operations, a safety review would need to be undertaken in accordance with the requirements of applicable work, health and safety legislation.

Traffic, transport and access

The road network in the vicinity of the airport site is relatively uncongested, with only sections of Narellan Road and Camden Valley Way experiencing congested conditions in peak periods. While there is currently spare capacity on much of the network near the airport site, there is congestion on the broader strategic network including the M4 Motorway, M5 Motorway, M7 Motorway and M31 Hume Highway.

Construction of the Stage 1 development would generate an estimated 1,254 additional vehicle movements per day on the surrounding road network during the construction period. This includes approximately 310 peak hour vehicle movements during both the morning and afternoon peak period. In the context of the broader Western Sydney region, this would not be considered a significant increase. A community engagement program would be implemented during construction, to ensure that the local community and road users are kept informed about construction activities and expected delays, if any. A construction traffic management plan would also be implemented to ensure that construction traffic (including any oversize vehicles) is appropriately managed.

Operation of the Stage 1 development is expected to result in approximately 41,800 vehicles entering and leaving the airport site each day by 2030. With the introduction of the M12 Motorway, this additional traffic is not likely to significantly affect the operation of the surrounding road network but is expected to result in small increases in congestion at The Northern Road/M4 intersection and on Mamre Road.

A significant amount of road improvement works is proposed as part of the Western Sydney Infrastructure Plan in addition to those identified in planning for the Western Sydney Employment Area and South West Priority Growth Area. These are expected to provide sufficient capacity to cater for the expected passenger and employee traffic demand associated with the proposed airport in 2030.

The public transport, walking and cycling systems proposed by the NSW Government and local councils in the region would also have sufficient capacity to cater to the expected airport passenger and employee demand at the proposed airport. Assessment of the long term development considers the need for an extension of the South West Rail Link to the airport site based on increasing demand.

Biodiversity

The airport site comprises gently undulating, low hills on shale and broad flats on alluvium on the Cumberland Plain. It features remnant patches of grassy woodland and narrow corridors of riparian forest within extensive areas of derived grassland, cropland, and cleared and developed land. The condition of native vegetation at the airport site is generally poor and there is moderate to severe weed infestation throughout the site. The main land uses are agriculture and low density rural-residential development. Notwithstanding the generally poor condition of the site, it has high conservation significance as a result of the presence of threatened species and ecological communities and the generally limited extent and quality of similar environments in the Western Sydney region.

Construction of the Stage 1 development would result in the removal of approximately 1,065 hectares of vegetation. The majority of this vegetation consists of exotic grassland and cleared land or cropland, dominated by exotic species and noxious and environmental weeds. About 280 hectares of native vegetation would be removed. The removal of vegetation at the airport site would result in the loss of fauna foraging, breeding, roosting, sheltering and/or dispersal habitat. Construction of the Stage 1 development would also result in indirect impacts on terrestrial and aquatic flora and fauna, including impacts associated with increased fragmentation, altered hydrology, erosion and sedimentation, dust, light, noise and vibration. Indirect impacts may also include fauna displacement, injury and mortality.

Operation of the proposed airport would pose a risk of fauna strike from contact with aircraft and ground transportation vehicles. Indirect impacts may include those associated with light, noise and vibration and the introduction of exotic species.

The Stage 1 development would affect threatened species, populations and ecological communities listed under both the EPBC Act and the *Threatened Species Conservation Act 1995* (TSC Act). Assessments of significance have been prepared for matters of national environmental significance protected under the EPBC Act in accordance with significant impact guidelines prescribed by the EPBC Act. The outcome of these assessments is that the Stage 1 development is likely to have a significant impact on Cumberland Plain Woodland, the Grey-headed Flying-fox and other plants and animals (including a number of species and populations listed as threatened under the TSC Act) in an area of Commonwealth land.

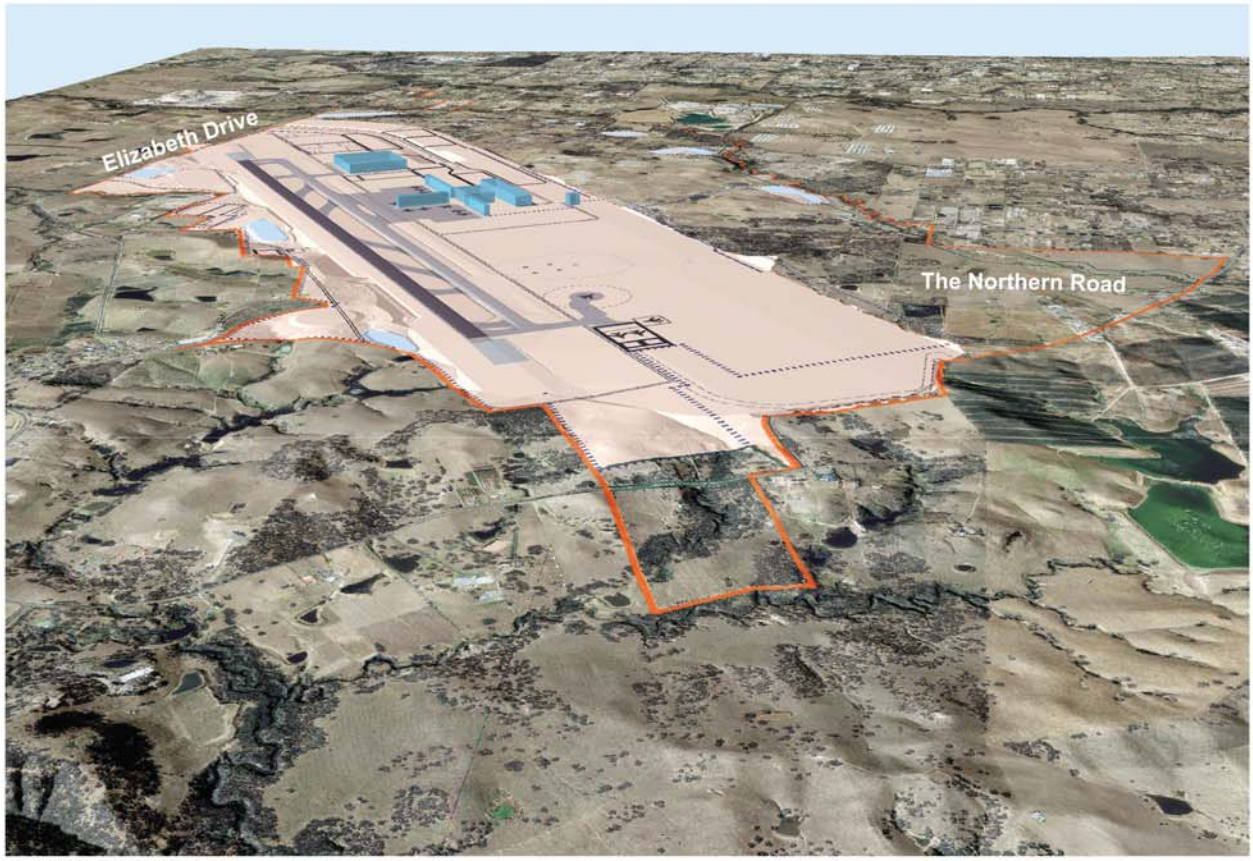
Mitigation and management measures would be implemented to reduce the potential impacts on biodiversity. These measures would include staged vegetation removal during construction, pre-clearing surveys and plans for the salvage of fauna and habitat resources, translocation programmes for threatened flora and fauna species/populations, and designing the airport to minimise its attractiveness to fauna in order to minimise bird, bat and terrestrial fauna strike. In addition, an environmental conservation zone would be established along the southern perimeter of the airport site where approximately 122 hectares of land would be protected.

Biodiversity offsets are required to compensate for significant residual impacts arising from the proposed airport. An offset package has been prepared to compensate for the removal of about 90.8 hectares of Cumberland Plain Woodland, the removal of about 120.6 hectares of foraging habitat for the Grey-headed Flying-fox, and other features of the natural environment including plant populations, fauna populations and several species and communities listed under NSW legislation. The offset package is intended to conserve habitat for the affected threatened biota in suitable offset sites in the surrounding region in perpetuity.

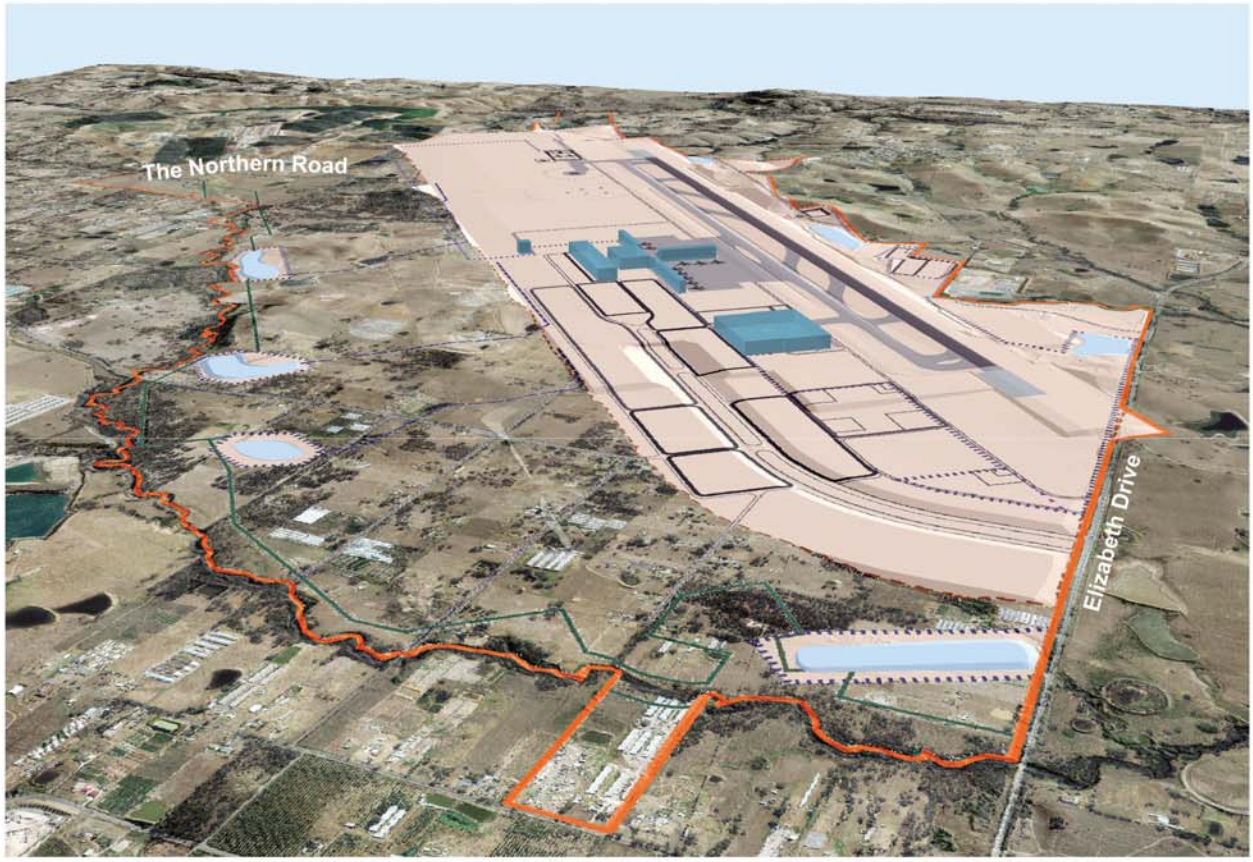
Topography, geology and soils

Soils at the airport site are primarily firm residual clays with areas of alluvial gravels, sands, silts and clays associated with Badgerys Creek.

A major bulk earthworks programme would be carried out for the construction of the Stage 1 development. The programme would essentially involve the redistribution of about 22 million cubic metres of soil across a construction impact zone covering about 60 per cent of the airport site, to achieve a level surface suitable for the construction of airport facilities. The modified landform and Stage 1 layout is presented in Figure ES 16.



view to the north-east



view to the south-west

Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Airport site
- Terminal buildings and support facilities
- Runways
- Taxiways and aprons
- Detention Ponds
- Landscape area

Figure ES16 Indicative Stage 1 Landform

Construction and operation would also involve the controlled storage, treatment and handling of fuel, sewage and other chemicals with the potential to contaminate land.

Measures including erosion control structures, sediment basins and stockpile management are required to mitigate and manage potential soil erosion and degradation associated with such a large earthworks operation. Fuel and other chemicals would be stored and handled in accordance with relevant standards and regulations, minimising the potential for contamination to occur.

Previous activities at the airport site including agriculture, light commercial and building demolition mean there is potential for contaminated land to be present. Any contamination discovered during construction would be managed and mitigated to make the land suitable for its intended use and to prevent impacts on human health and the environment.

The potential impacts of the operation of the airport are typical of a large-scale infrastructure project and would be managed with the implementation of stormwater, erosion and dust controls and adherence to industry standards for the storage and handling of chemicals. Sewage would be treated and irrigated in accordance with an irrigation scheme that maintains the receiving soil in a stable and productive state.

Surface water and groundwater

The airport site contains about 64 kilometres of mapped watercourses and drainage lines (notably Badgerys Creek, Cosgroves Creek and Duncans Creek) and overlies the Bringelly Shale aquifer as well as unconfined areas of alluvial groundwater. Water quality sampling indicates that existing water quality is relatively degraded, with high levels of phosphorous and nitrogen in surface water attributable to land uses at the proposed airport site and within the broader catchment.

Site preparation and construction of the Stage 1 development would transform the airport site from a rolling grassy and vegetated landscape to an essentially built environment with some landscaping. These changes would alter the catchment areas within the airport site and the permeability of the ground surface, which would in turn alter the duration, volume and velocity of surface water flow.

Water would be utilised during construction for soil conditioning and dust suppression. Water supply options include water reticulated to the site from existing major utilities and extraction from existing surface water resources.

The design of the Stage 1 development includes a drainage system to control the flow of surface water and improve the quality of water before it is released back into the environment. This drainage system comprises a series of channels and basins to collect and treat flows prior to release to receiving waters. The assessment indicates that this system would be generally effective at mitigating flooding and water quality impacts.

The transformation of the airport site would alter groundwater levels and recharge conditions through an increase in impervious surfaces. Bulk earthworks and excavations at the airport site would also receive some groundwater inflows, which would require management during construction and operation. Impacts on groundwater levels, including impacts on dependent vegetation or watercourses, would be unlikely to be significant given the existing low hydraulic conductivity and water quality of the Bringelly Shale aquifer. Registered bores surrounding the airport site are understood to target the Hawkesbury Sandstone aquifer, which is significantly deeper than the Bringelly Shale aquifer and not considered to be connected. As such, impacts on groundwater users are not expected.

The identified impacts would likely be further reduced during detailed design of the surface water drainage system. Baseline and ongoing monitoring of surface water and groundwater would be undertaken to characterise any residual impacts and prompt corrective action where necessary.

Aboriginal heritage

Since the early 1800s, land use at the airport site has consisted of varying phases of stock grazing, cropping, orcharding, dairying, market gardening, poultry farming and some light industrial functions. Consequently, most of the original native vegetation has been cleared and the airport site is now dominated by agricultural grasslands or cultivated fields with small pockets of open eucalypt woodland or shrubland. These activities are expected to have had a substantial impact on the Aboriginal archaeological resource, especially in the top soil and the plough zone at the airport site.

The airport site has been the subject of a number of previous archaeological assessments as part of the search for an appropriate site for a second Sydney airport. These previous assessments date back to 1978, with the most recent being undertaken in 2014. Fifty-one Aboriginal heritage sites have been recorded during these surveys, consisting of surface artefact occurrences and a modified tree. Twenty-three additional sites were recorded at the airport site during the course of the current assessment, which focused on test excavation and characterising the sub-surface archaeological resource. The new recordings comprised nine sites with surface artefacts (including a grinding groove site) and 14 sites where subsurface artefacts were confirmed through test pit excavations.

The test excavation programme included a representative sample of landform types and zones within the airport site. It was determined that a relatively high average artefact incidence occurred across valley floors, basal slopes, first-order spurlines and within 100 metres of second, third and fourth order streams. These findings are generally consistent with numerous other investigations in the vicinity of the airport site that have confirmed that Aboriginal heritage sites occur widely across the landscape, but particularly on elevated level ground and slopes within relative proximity of a water source. These investigations also indicate that larger sites with higher artefact densities are more likely to be found near permanent water.

Aboriginal stakeholder consultation undertaken for this draft EIS identified the airport site as a place of cultural significance and continuing cultural connection. The reasons for this include the site's material evidence of occupation, its cultural landscape values, and culturally significant plants, animals and resources. All of these contribute to a sense of place and cultural identity, and are considered to be a valuable educational resource.

In addition, the remaining Aboriginal sites across the Sydney hinterlands may be considered to have an intrinsic value because of their endurance amid concerns about disappearing heritage; the cumulative impacts on Aboriginal heritage sites caused by continuing urban and industrial development of the Cumberland Plain effectively impose a greater significance on those sites that remain.

All of the Aboriginal heritage sites recorded at the airport site are considered to have significance. Many sites contain archaeological material which has both cultural and scientific value, and all sites, irrespective of their scientific or other values, are considered to be culturally significant by the Aboriginal community The predicted archaeological resource of the airport site, as revealed by the test excavation programme, is also assessed to be significant.

Construction of the proposed Stage 1 development would affect at least 39 sites recorded at the airport site, all of which comprise artefact occurrences. Construction activities would also affect approximately 500 hectares of archaeologically sensitive landforms. Impacts during operation of the proposed airport would be limited to indirect impacts on adjacent and nearby sites. The heritage values of these sites are unlikely to be vulnerable to indirect impacts such as loss of context. Consequently, the operational impacts of the proposed Stage 1 development would be low.

Mitigation and management measures would be implemented to minimise the impacts on Aboriginal cultural heritage. These measures would include the conservation of heritage sites in situ, recording of heritage sites and salvage of heritage items, the commemoration of cultural heritage values at the airport site, curation and repatriation of heritage items and protocols for the discovery of artefacts and human remains.

European heritage

A total of 19 European heritage items have been recorded at the airport site and an additional 22 heritage items have been recorded in the surrounding area. The identified European heritage items reflect the historical context of the airport site and European settlement more generally, including early attempts to develop local agricultural and pastoral economies and the emergence of settled village communities.

Site preparation activities would take place before construction of the Stage 1 development. These activities would require the removal of European heritage items from the airport site, which would preclude the in situ preservation of heritage items. Impacts during operation of the proposed airport would be limited to indirect impacts on nearby sites. Indirect impacts of construction and operation on European heritage items surrounding the airport site would include altered landscapes, views and ambience. These impacts are not expected to be significant and would not require implementation of management and mitigation measures.

Mitigation and management measures would be implemented to minimise the impacts on European cultural heritage. These measures would include further archaeological investigations, archival recording, creating an inventory of moveable items, cultural planting investigations, potentially relocating structures and relocating remains located in grave sites and the staged demolition of structures.

Heritage awareness training would be provided to all workers involved in site preparation and construction of the proposed airport. This would include training in the procedure to be followed if European heritage items are discovered during site preparation or construction. The potential presence of unmarked graves at the airport site also necessitates a procedure for the discovery of human remains. These procedures would have regard to the relevant legislation and guidelines.

The preparation of an oral history would be considered as a measure to preserve the heritage value of the airport site. The heritage value of the airport site would also be reflected through the detailed design of the proposed airport.

Planning and land use

To enable the development of the proposed airport, existing rural residential, agricultural, recreational, community and extractive industry land uses on the airport site would be removed. Surrounding land uses could be expected to transition from rural to urban both as a result of airport operations, and as strategic land use planning under the Western Sydney Employment Area and the South West Priority Growth Area takes effect. Infrastructure improvements to main roads and railways would also facilitate land use change in the region.

Measures to manage land use and planning impacts are proposed, including mitigation measures for employment land use conflict, zoning rationalisation, operational airspace controls, aircraft noise and infrastructure corridor protection. The successful implementation of these measures would lead to the airport and its surrounds becoming a focus for employment generating land uses in Western Sydney, creating jobs for the new residents of the South West Priority Growth Area and Greater Western Sydney.

Landscape and visual amenity

The airport site and surrounds are typified by gently undulating landform within a highly modified landscape. The overall landscape character is open and rural with expansive views possible from surrounding hill tops and higher elevations to the west. The area's character is also defined by cleared pastureland, and large lot residences (both single and double storey) set back from the road network. Patches of remnant vegetation exist within the airport site, particularly along creek lines, road edges and near farm dams.

The construction of the proposed airport is likely to have temporary visual impacts for the nearest sensitive receivers in Luddenham and Bringelly. This would be largely due to the visibility of earthworks and the presence of construction plant, equipment, stockpiling areas and storage areas. Viewpoints that are further away would have more restricted views of the airport site and would, therefore, be less affected.

During operation, the potential for moderate to high visual impacts as a result of overflights have been identified for Luddenham and Mount Vernon, and also along Elizabeth Drive and Lawson Road. Lower level impacts as a result of overflights were identified for areas to the south of the airport site including along Silverdale Road and Dwyer Road, and within Bents Basin State Conservation Area. Operational lighting is likely to have low impacts on sensitive receivers due to topography, existing vegetation, building design, lighting design and runway configuration.

Mitigation measures are proposed to minimise visual impacts during construction and operation. These include design measures as well as investigating opportunities for retention of existing vegetation and revegetation in suitable areas.

Social

The Western Sydney region is diverse, with densely populated and highly urbanised areas, to semi-rural and recreational/natural areas. Many areas of the region are culturally diverse, with strong heritage values (both Aboriginal and European), cohesive communities, natural and recreational values, and connections to the employment hubs of Parramatta and Sydney Central Business Districts.

The major employment, residential and transport infrastructure projects proposed for Western Sydney demonstrate the critical role of the region in Sydney's future. These projects will support the proposed airport, which is recognised as a significant catalyst for increased and faster growth for Western Sydney, and for Greater Sydney more broadly. These projects, along with the proposed airport, have the potential to bring significant change to the people and the economy of Western Sydney.

Economic

The construction and operation of the Stage 1 development is expected to have significant benefits for the economy of Western Sydney and the broader Sydney region as a whole. During the busiest periods of construction, up to 758 full-time equivalent jobs are expected on the airport site. Based on this number, the multiplier effect is expected to generate a further 520 jobs per year across the rest of the Sydney region. In terms of value add, an estimated total direct and indirect economic contribution of $1.9 billion is expected to be generated during the construction period, with a further $400 million generated across the rest of Sydney.

Once the proposed airport is operational, Western Sydney is expected to experience an increase in employment driven by improved access to workers and other businesses. Manufacturing and consumer service sectors would see the largest changes due to improved accessibility. These benefits will increase significantly as the airport develops in the decades ahead.

There is expected to be a significant increase in population near the airport site of up to nine per cent due to an increase in employment opportunities. However there would be some negative economic impacts in the immediate vicinity of the airport site due to a combination of the airport development and the changing land uses. The expected population increases would be likely to reduce with distance from the airport site.

Resources and waste

Construction of the proposed airport would involve clearing and a major bulk earthworks programme to achieve a level surface suitable for the construction of airport facilities, along with the use of a range of construction materials. As with any large infrastructure project, the construction and operation of the proposed airport would involve the consumption of natural resources and has the potential to generate substantial quantities of waste.

The peak for waste generation would be during construction, when an estimated 202,500 tonnes of waste vegetation and construction materials such as concrete and timber would be generated. During the initial airport operations, an estimated 5,251 tonnes of waste would be generated each year, and would include general waste, food, packaging waste from terminals and waste oils, paints and cleaners from maintenance activities.

Resources and waste from the airport would be sustainably managed by maximising waste avoidance, reduction, reuse and recycling (in accordance with a waste management hierarchy), while mitigating and managing impacts on human health and the environment. A waste management plan would be prepared prior to construction and operation of the airport, which would guide the management of waste during construction and operation.

The waste management market in Western Sydney is mature and handles significant volumes of waste from various domestic, commercial and industrial sources across all of Sydney. Waste facilities in Western Sydney have sufficient capacity to handle wastes of the type and volume expected to be generated at the airport site.

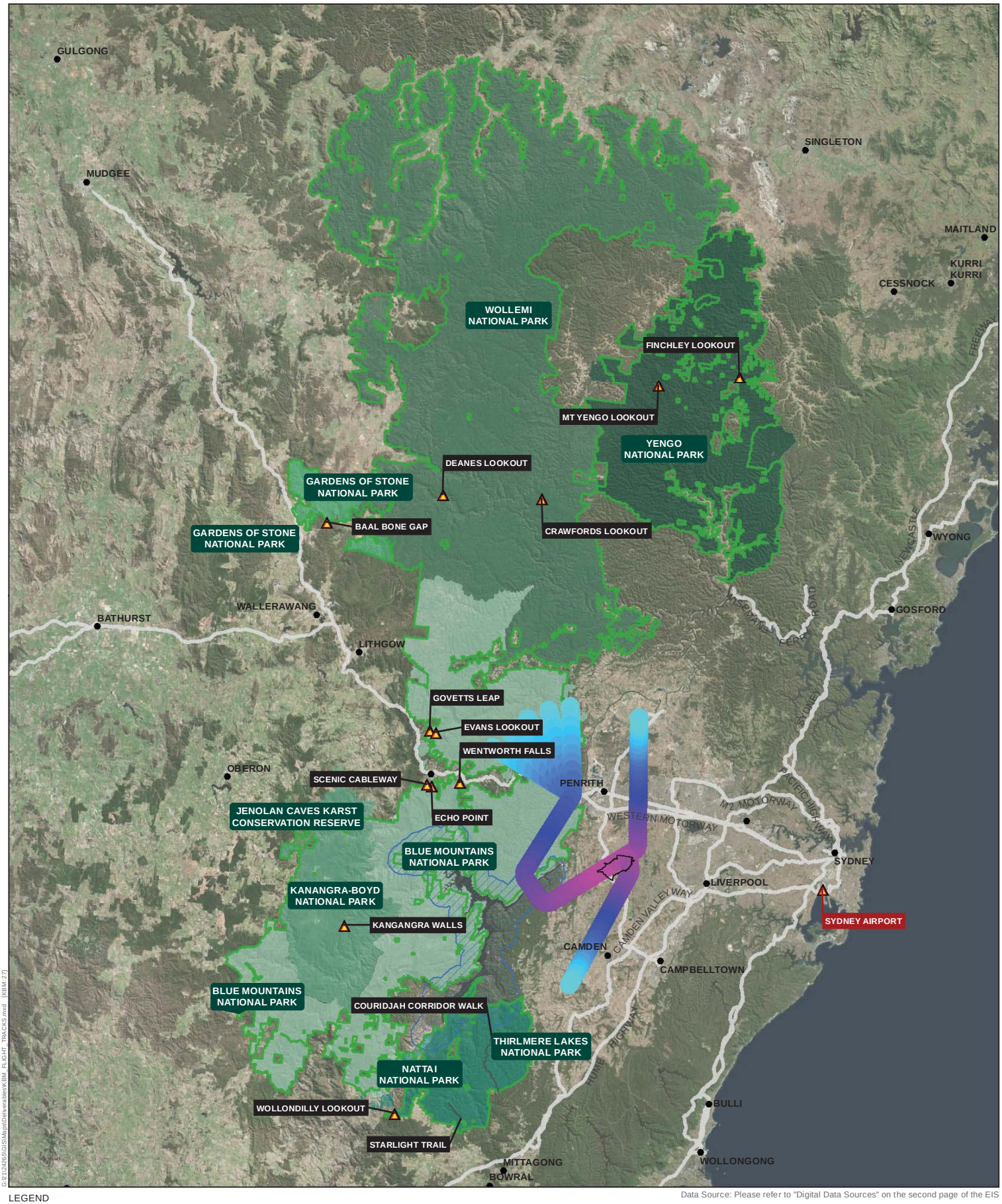
Greater Blue Mountains

The Greater Blue Mountains World Heritage Area (GBMWHA) covers 1.03 million hectares of sandstone plateaus, escarpments and gorges dominated by temperate eucalypt forest. The site constitutes one of the largest and most intact tracts of protected bushland in Australia and is noted for its representation of the evolutionary adaption and diversification of the eucalypts in post-Gondwana isolation on the Australian continent.

The Greater Blue Mountains Area was inscribed on the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List because it satisfies two of the criteria for natural values of outstanding universal value, including representative examples of the evolution of Eucalyptus species (Criterion ix) and diversity of habitats and plant communities (Criterion x). In addition to the features recognised by the World Heritage Committee as having World Heritage value, the GBMWHA has a number of other important values, which complement and interact with the World Heritage values of the area including recreation, tourism, wilderness, scenic and aesthetic values.

Potential impacts arising from the proposed airport to the World Heritage values and other values of the Greater Blue Mountains Area were assessed against the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (DoE 2013a). The boundary of the GBMWHA is approximately eight kilometres from the proposed airport at its closest point. Site specific direct impacts associated with the construction of the airport are not expected to influence the values of the GBMWHA. A number of indirect operational impacts on the GBMWHA are expected in relation to noise, regional air emissions and visual impact from the overflight of aircraft.

Almost all flights would be at an altitude greater than 5,000 feet and most would be more than 10,000 feet above sea level when passing over the GBMWHA (Figure ES 17 and Figure ES 18). No flights are expected to occur below 6,000 feet above ground level in the vicinity of identified sensitive areas. At these altitudes, aircraft are likely to be difficult to discern from ground level and are not considered to be visually obtrusive. Indicative flight tracks at altitudes of less than 5,000 feet in 2030 are limited to Warragamba and the eastern boundary of the Blue Mountains National Park, which would experience 50 to 100 flights per day.



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LEGEND

Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

- Airport site
- Greater Blue Mountains World Heritage Area
- Drinking Water Catchment – No Entry Area

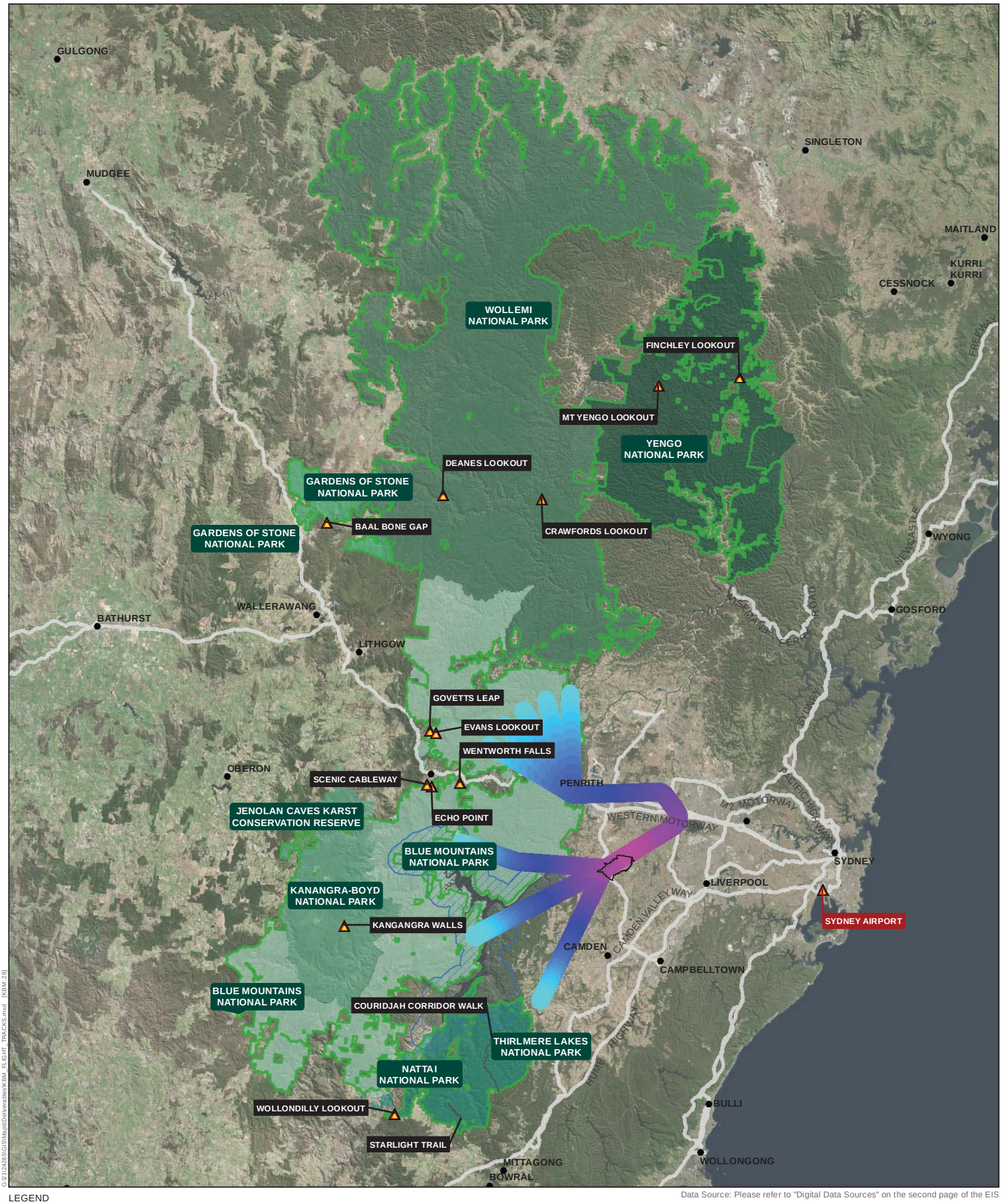
Flight track altitude below 10,000 feet

- 10,000 ft
- 5,000 ft
- 0 ft

0 5 10 20
Kilometres

N

ES 17 - Flight track altitude below 10,000 feet above sea level, prefer 05 single runway



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LEGEND

Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

- Airport site
- Greater Blue Mountains World Heritage Area
- Drinking Water Catchment – No Entry Area

Flight track altitude below 10,000 feet

- 10,000 ft
- 5,000 ft
- 0 ft

0 5 10 20
Kilometres

N

ES 18 - Flight track altitude below 10,000 feet above sea level, prefer 23 single runway

Generally across the GBMWHA, minimal incursion of noise levels above 55 dBA would occur. Echo Point at Katoomba would not experience impacts from increased noise levels, and the majority of other sensitive areas are predicted to be affected only during the infrequent operation (predicted to be once every two days) of the Boeing 747 (or equivalent).

Emergency fuel jettisoning is very unlikely to have any impact on the GBMWHA due to the rarity of these events, the inability of many aircraft such as the Boeing 737 and A320 to perform fuel jettisons, the rapid vaporisation and wide dispersion of jettisoned fuel and the strict guidelines on fuel jettisoning altitudes and locations.

Mitigation and management of potential noise impacts would be achieved through the implementation of flight planning and airspace design. The measures would include requirements regarding flight paths, altitude and operational parameters for different aircraft. The potential noise and amenity impacts from aircraft flying over wilderness areas of the GBMWHA, and Aboriginal sites promoted for public visitation, would be considered in the future development of formal flight paths for the proposed airport by Airservices Australia, subject to requirements for safe and efficient aircraft operations. In terms of the indirect impacts from aircraft operations, the proposed airport would not have a significant impact upon the GBMWHA.

The proposed airport would not result in attributes of the World Heritage Area being lost, degraded or damaged, or notably altered, modified, obscured or diminished.

Long term airport strategic environmental assessment

A strategic level assessment of the long term development of the proposed airport is provided in Volume 3 of the draft EIS. The strategic level assessment recognises the uncertainty in predicting impacts that may occur up to 50 years into the future, and the additional approval and consultation requirements for all future development. The assessment approach provides flexibility in the master planning process for the airport site to allow land use changes, technological improvements and changes in operational practices to be reflected in future development scenarios.

The focus of the assessment for the indicative long term development centres on potential impacts of the expanded operations on the amenity of the surrounding community.

The key issues considered as part of the assessment of the long term operation of the proposed airport include noise, air quality, human health, traffic and transport, landscape and visual amenity, and socio-economic impacts. Direct physical impacts are also discussed, including those associated with biodiversity, water resources, heritage and planning and land use.

The key long term environmental impacts are summarised below.

Noise

It is recognised that aircraft noise is one of the most sensitive issues associated with the development of the proposed airport and an increase in air traffic movements beyond the Stage 1 development have the potential to increase the level of noise disturbance to the surrounding community. Taking this into account, aircraft noise impacts were considered for a 2050 scenario in which the single runway is operating close to capacity and for a long term scenario around 2063 in which the airport layout incorporates two runways.

Assessment of the noise impacts associated with the long term development of the proposed airport considered aircraft noise and ground-based noise.

For the loudest aircraft operations (long-range departures by Boeing 747 aircraft or equivalent), maximum noise levels over 85 dBA would be experienced at residential locations close to the airport site, in the area of Badgerys Creek. Maximum noise levels of 75 to 80 dBA would be expected within built-up areas in St Marys and Erskine Park under these worst case operating conditions. Maximum noise levels due to more common aircraft types such as the Airbus A320 or equivalent are predicted to be 60 to 70 dBA in built-up areas around St Marys and Erskine Park, and above 70 dBA in some adjacent areas to the south-west of the airport site, notably the area of Greendale.

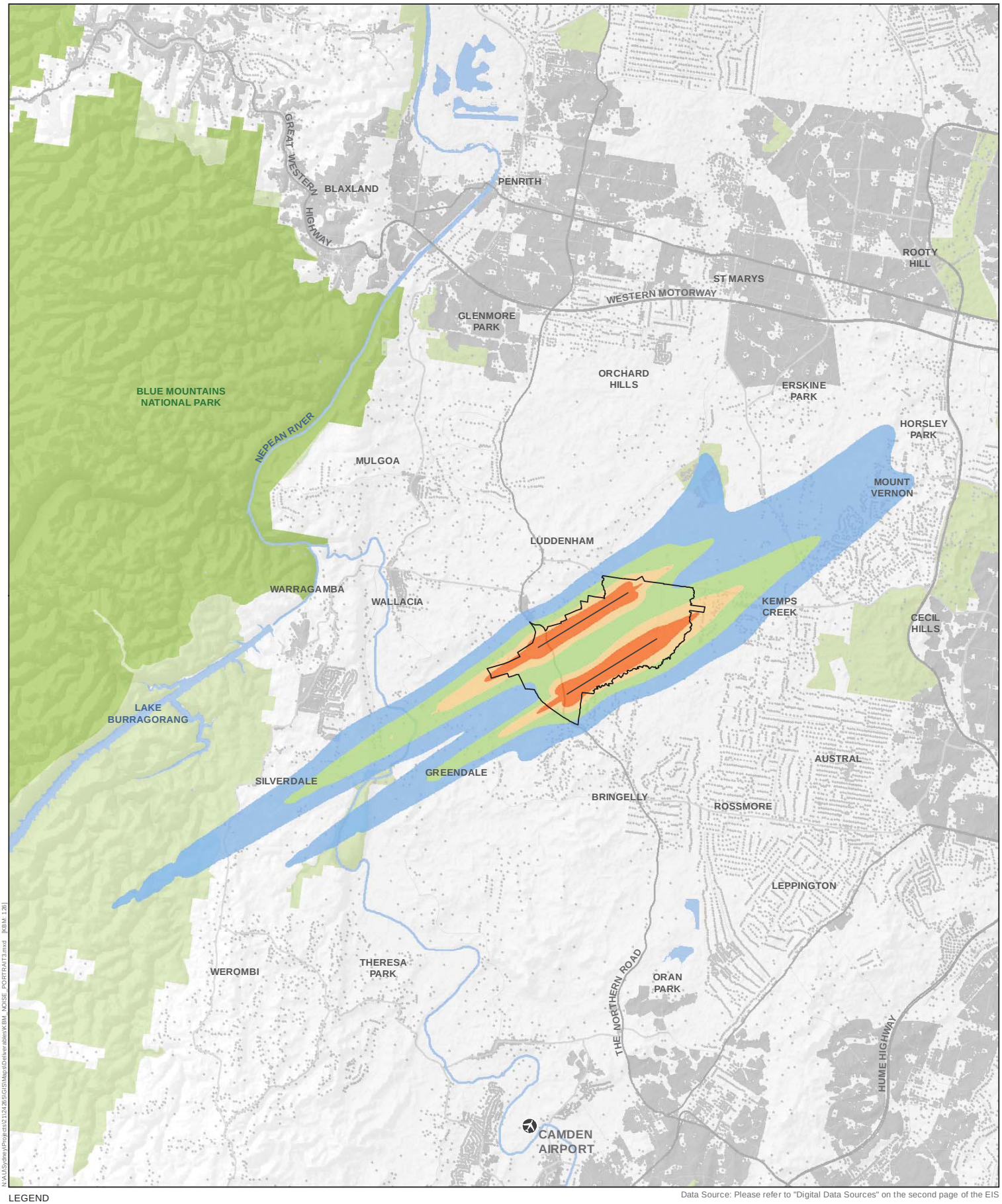
The extent to which particular areas would be potentially exposed to aircraft noise would be strongly influenced by the airport operating strategies especially when operating a single runway at maximum capacity. In terms of total population, the ‘Prefer 05’ operating strategy (which gives preference to approaches and departures in a south-west to north-east direction) is predicted to have substantially more impact on existing residential areas than the ‘Prefer 23’ operating strategy, in which the opposite direction is preferred. Most residents that would be affected under the ‘Prefer 05’ strategy are in suburbs to the north of the airport site, including St Marys and Erskine Park. Predominantly rural-residential areas to the south-west, including Greendale and parts of Silverdale would be affected under the ‘Prefer 23’ strategy. Adoption of ‘Head to Head’ operations would also slightly reduce the number of residents affected.

For night-time operations in 2050, the operating strategy with least impact is ‘Prefer 23 with Head-to-Head’. Other operating strategies are predicted to result in substantially greater numbers of residents being affected by night-time noise, and in particular, a ‘Prefer 05’ strategy would result in large parts of St Marys experiencing more than 20 aircraft noise events per night above 60 dBA.

The operating strategies would have less influence following the implementation of operations on the second runway. Despite the forecast number of movements at the airport approximately doubling between 2050 and 2063, there are fewer densely populated areas currently located within the noise affected areas, particularly for the Prefer 05 operating strategy. The reason is that movements can be spread between two runways and the locations of flight paths are less constrained in the two runway scenario. The continuation of existing planning controls will limit the potential for new residential development to be impacted by a progressive increase in usage of the airport. The modelled 2063 ANEC contours for the long term development are shown on Figure ES 19 and Figure ES 20 and are generally comparable to the 1985 ANEC with slight extensions to the north and the south-west. These differences primarily reflect revised modelling assumptions including updated forecasts for the number of aircraft movements, new indicative flight paths and changes in the assignment of aircraft to particular flight paths.

The existing planning controls based on the 1985 ANEC contours have restricted development within the majority of the land area covered by the modelled 2063 ANEC contours.

Approaches to mitigating aircraft overflight and runway noise would generally focus on reducing noise emissions from the aircraft themselves, adjusting flight paths and airport operating modes, and developing land use planning or other controls to ensure that future noise-sensitive uses are not located in noise-affected areas.



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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

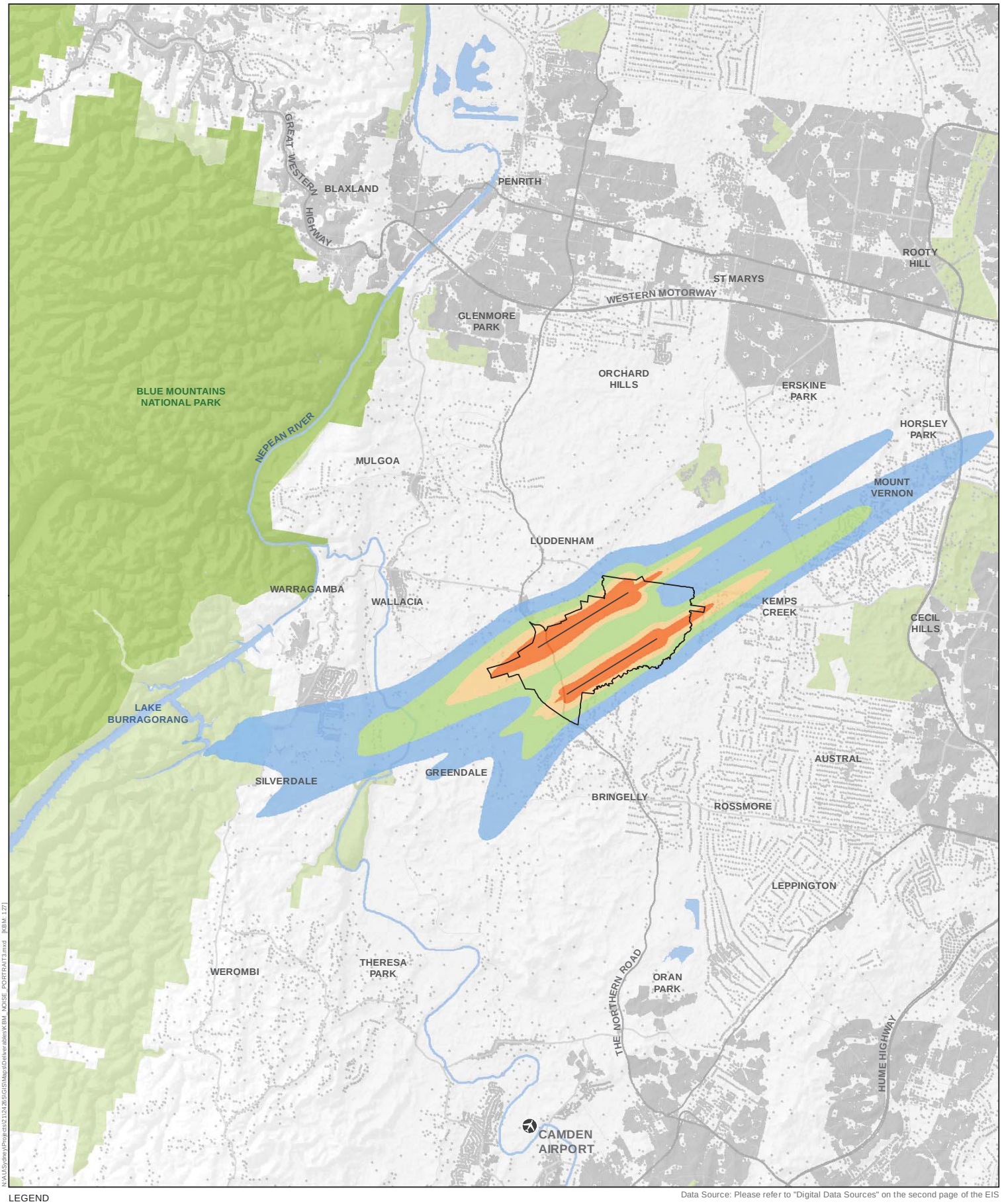
LEGEND

- Western Sydney Airport
- Runway
- Airfields
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves
- ANEC = 20-25
- ANEC = 25-30
- ANEC = 30-35
- ANEC = 35+

0 1 2 4
Kilometres

N

ES 19 - ANEC contours for Prefer 05 operating strategy (2063)



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Data Source: Please refer to "Digital Data Sources" on the second page of the EIS

LEGEND

- Western Sydney Airport
- Runway
- Airfields
- Buildings
- Greater Blue Mountains World Heritage Area
- Parks and reserves
- ANEC = 20-25
- ANEC = 25-30
- ANEC = 30-35
- ANEC = 35+

0 1 2 4
Kilometres

N

ES 20 - ANEC contours for Prefer 23 operating strategy (2063)

Air quality

Operation of the long term development would result in an increase in emissions of nitrogen dioxide, PM_{10}, $PM_{2.5}$, carbon monoxide, sulfur dioxide and air toxics. Given the uncertainty regarding the future reduction in ground vehicle and aircraft engine emissions, and the anticipated general reduction in background emissions over time, ground level concentration predictions were assessed only for the key criteria pollutants (nitrogen dioxide, PM_{10}, and $PM_{2.5}$) for the long term development. Several exceedances were predicted at sensitive receptors for these indicators.

There would be measurable ozone impacts from the operation of the long term development. These emissions can only be managed through the use of best available techniques and/or emission offsets. Ongoing improvements in aircraft technology would continue to improve emissions from aircraft.

Actual air emissions from the operating long term development may be lower than predicted given the use of electric gates (instead of auxiliary power units), increased use and optimisation of proposed rail connections (instead of motor vehicles) and progressive improvements in aircraft technology.

Traffic

The long term development is expected to result in around 85,000 additional vehicle trips each day. These additional trips would be generated in the context of substantial urban growth forecasts for Western Sydney. Airport-generated travel and the substantial forecast development growth in Western Sydney would significantly increase demand on roads and public transport. Additional transport infrastructure, including an extension to the South West Rail Link or other direct rail link, would be needed to address this demand.

Visual

Future development of the areas surrounding the airport site, under provisions of the Western Sydney Employment Area and the South West Priority Growth Area, would lead to a significant transition from an environment that is predominantly rural in character to one that has a more urban form. In general terms, this is expected to reduce the visual impact of the proposed airport development, including night-time lighting effects, as the proposed airport is integrated into the changing urban visual character of the area.

Conclusions

The proposed airport would be developed on Commonwealth-owned land at Badgerys Creek in Western Sydney and would cater for ongoing growth in demand for air travel, servicing both domestic and international markets.

Development of the proposed airport would be a catalyst for investment and job creation in the region by accelerating the delivery of important infrastructure and the release of employment and housing land, and providing a long term and diverse source of local jobs and economic activity. Additionally, the proposed airport would improve access to aviation services for the growing population of Western Sydney.

A draft Airport Plan has been developed to provide the strategic direction for development of the proposed airport, forming the basis of the authorisation for the project under the Airports Act. The draft Airport Plan includes a specific proposal for Stage 1 to establish the proposed airport with a single 3,700 metre runway on a north-east/south-west orientation and aviation support facilities to provide an operational capacity of 10 million annual passengers as well as freight traffic.

This draft EIS has been prepared in accordance with Part 3 of the EPBC and the Department of the Environment guidelines for the assessment of the airport proposal (EPBC 2014/7391).

Based on the findings of the environmental investigations undertaken to inform this draft EIS, the proposed airport would result in some adverse impacts on the environment and the community. Mitigation measures have been proposed including the need for further design, both for the airport site and airspace operations, to reduce these potential impacts during construction and operation.

The environmental performance of the proposal would be managed through the implementation of environmental management plans and monitoring programmes. This would aid in ensuring compliance with relevant legislation and any conditions set out in the Airport Plan.