

8. AIRPORT SAFEGUARDING

8.1 SAFEGUARDING FRAMEWORK

The National Airports Safeguarding Framework presents six guidelines, endorsed by Commonwealth, State and Territory Ministers, to enhance the current and future safety, viability and growth of aviation operations. These six guidelines are:

- Guideline A: Measures for Managing Impacts of Aircraft Noise;
- Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports;
- Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports;
- Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation;
- Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports; and
- Guideline F: Managing the Risk of Intrusions into Protected Airspace of Airports.

The NASF Principles state that Guidelines for Public Safety Zones, and the protection of Communication, Navigation and Surveillance Infrastructure will also be considered at a later stage.

8.2 AIRCRAFT NOISE

One of the most obvious impacts of airport operations on the surrounding community is aircraft noise. While the Jandakot Airport site was originally farmland, the close proximity of Jandakot to the Perth CBD and the rapid population growth in Perth has resulted in residential communities becoming established around the airport.

The *Airports Act 1996* requires that a master plan include an Australian Noise Exposure Forecast (ANEF) chart and the airport's plans for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels.

8.2.1 AIRCRAFT NOISE MODELLING

There are four types of noise chart indicators used in Australia:

- Australian Noise Exposure Index (ANEI), which depicts the actual noise exposure over a previous period of time, usually a year;
- Australian Noise Exposure Concept (ANEC), which is a planning tool used to test possible changes to noise exposure resulting from possible changes to airport operations;
- Australian Noise Exposure Forecast (ANEF), which is endorsed for technical accuracy by Airservices Australia and is the official land use planning reference. There can only be one ANEF in force at a particular time. Under the Act, Jandakot Airport's ANEF is required to be updated at least every five years, in conjunction with the Master Plan update; and
- Noise Above Contour (N60/65/70) charts, which calculate the average daily noise events above 60, 65 or 70 decibels (dbA). The Noise Above Contours represent the frequency of the expected aircraft noise impact and provide a more readily understood measure of noise exposure for the general public.

The noise chart indicators are prepared using the US Federal Aviation Administration Integrated Noise Model (INM) computer program. The INM is the standard noise modelling tool that has been used worldwide since 1978, and the software is continuously upgraded by the US Federal Aviation Administration as new aircraft or other factors are added to improve the accuracy of the exposure forecast.

The INM is a scientific measure that takes into account:

- meteorological conditions at the airport;
- forecast aircraft movement volume and frequency;
- allocation of these movements to flight paths and distribution over the day and night time periods; and

- the noise signature (intensity, duration and tonal content) and performance characteristics of the specific aircraft types.

The time of day is also factored into the noise computation to allow for people being more sensitive to aircraft operations at night.

The ANEF and ANEI charts presented in this Master Plan were produced with INM Software Version 7.0d. The main change in this version of the software has been to allow helicopters to be modelled for all phases of flight, including ground idle and hovering. The INM version used at the time of the preparation of ANEF 2029/30, as included in Master Plan 2009, had a limited ability to model helicopter operations.

The N60, N65 and N70 noise contours were produced using INM in conjunction with the Transparent Noise Information Package software developed by the Department of Infrastructure and Regional Development.

8.2.2 AUSTRALIAN NOISE EXPOSURE FORECAST

For land use planning purposes in Australia, noise impact is illustrated using the ANEF system. An ANEF chart displays the predicted noise exposure levels for aircraft movements 20 years into the future.

The ANEF chart illustrates noise contours plotted at 20, 25, 30, 35 and 40 ANEF units. The contour plot is the calculated total noise energy at that given point on the ground on an annual average day. The higher the ANEF value, the greater the expected exposure to aircraft noise in that area.

The ANEF is referenced in Australian Standard AS2021-2000 'Acoustics - Aircraft Noise Intrusion – Building Siting and Construction' that provides land use planning and building treatment guidance in the vicinity of airports. Table 8.1 displays the restrictions that AS2021-2000 places on the types of new developments which can be built within various ANEF contours.

Table 8.1 Building Type Acceptability in ANEF Contours

Building Type	Acceptable	Conditional	Unacceptable
House, home, unit, flat, caravan park	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF	20 to 30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

VALIDATION OF NOISE MODELLING

The *Airports Act 1996* requires the ANEF contours to be endorsed in a manner approved by the Minister for Infrastructure. Ministerial Direction M37/99, issued under the *Airservices Act 1995*, prescribes that Airservices Australia is responsible for the endorsement of ANEFs for all Australian airports. In deciding whether to endorse an ANEF, Airservices must be satisfied that:

- the appropriate selection of aircraft types for the airport has been used as input data;
- the runway usage and flight path data used as an input to the model are operationally suitable for the airport;
- the forecast numbers of aircraft movements, operating times and the aircraft types carrying out operations are not greater than the physical ultimate capacity of the existing or proposed runway/s using accepted and published methodologies;
- the contours have been modelled correctly; and
- the proponent has demonstrated it has paid due regard to all issues raised by State and Local Government authorities in relation to the ANEF.

ULTIMATE CAPACITY ANEF

An Ultimate Capacity ANEF has been prepared to represent an average day when the airport reaches its maximum aircraft operating capacity (described in Section 4.2). The Ultimate Capacity ANEF was endorsed by Airservices for technical accuracy on 18 August 2014 and is shown at Figure 8.1.

Noise levels over particular periods vary due to prevailing winds, traffic demand and times of operation. The aircraft mix at Jandakot Airport includes a large range of aging aircraft types. It is realistic to assume that the older aircraft types will be replaced within the next 20 years, but it is impossible to know what aircraft types they will be replaced with. However, as newer aircraft types are generally much quieter than the older aircraft types, the ANEF calculation using the noise footprints of the current older fleet means that the ANEF presents a worse-case scenario.

Australian Standard 2021-2000 Appendix A states that the actual location of the 20 ANEF contour is difficult to define accurately because of variations in aircraft flight paths, pilot operating techniques and the effect of meteorological and terrain conditions on noise propagation. For that reason, the 20 ANEF contour is shown as a broken line on ANEF plans.

The NASF Alternative Aircraft Noise Metrics paper provided as Attachment I to the NASF Guideline A: Measures for Managing Impacts of Aircraft Noise, also acknowledges that while populations with the highest aircraft noise exposure often live within the 20 ANEF contour, the majority of noise complaints received are coming from residents living outside the 20 ANEF contour. Traditionally the residents of areas outside of the 20 ANEF contour have been given little information on aircraft noise through the ANEF system other than that the area is considered 'acceptable' for housing.

8.2.3 COMPARISON BETWEEN THE ANEF 2030 AND ULTIMATE CAPACITY ANEF

The Ultimate Capacity ANEF shows an overall noise footprint of 1490 hectares of land, which is a 60% increase from the ANEF 2029/30 prepared for Master Plan 2009. The proportion of total land area outside of the airport boundary affected by the ANEF has

increased slightly, from 59.8% in ANEF 2029/30 to 62.8% in the Ultimate ANEF. This increase is mostly attributed to the INM software being refined to model helicopters at all stages of flight (see Section 8.2.1), as the total number of movements used to calculate the new Ultimate ANEF has been reduced by 10.9% from the movement volume used for ANEF 2029/30.

The main changes from the 2029/30 ANEF are:

- The ultimate operational capacity of the airport has been reassessed. Due mainly to the impact of the Class D Airspace procedures introduced in 2010, which has reduced the number of aircraft permitted in the circuit area, the theoretical capacity of Jandakot Airport operations has been recalculated to be 460,000 fixed-wing movements and 66,000 helicopter movements per annum, as discussed in Section 4.3. This is a reduction of 54,650 fixed-wing and 10,000 rotary-wing movements per annum from the previous ANEF assessment;
- Inclusion of a new Standard Instrument Departure (SID) track to the southwest that has been planned by Airservices Australia to be implemented in 2014/2015. The new SID is being proposed to facilitate departure of Instrument Flight Rule aircraft into Perth controlled airspace. The formal environmental impact assessment and subsequent consultation for the new procedure will be completed by Airservices Australia; and
- There have been some changes made to the forecast aircraft types following feedback from the airport operators. However, the projected types of operations and allocation of runway use associated with the ultimate airfield layout have not changed from the ANEF 2029/30.

8.2.4 AREAS ABOVE SIGNIFICANT ANEF LEVELS

Section 71 of the *Airports Act 1996* requires JAH, as the airport-lessee company, to develop plans for managing aircraft noise intrusion in areas above significant ANEF levels (above 30 ANEF) in consultation with operators and local government bodies in vicinity of the airport. These noise management arrangements are detailed in Section 8.3.

There is a total of 265.5 hectares of land within the new Ultimate Capacity ANEF 30 Contour, with over 87% of this land area contained within the airport boundary. There is no material difference in the off-airport land areas within the 30 Contours of the Ultimate ANEF, 2029/30 ANEF and ANEI 2012/13. The two small areas where the Ultimate ANEF 30 Contour extends beyond the airport boundary are to the southwest and east as shown in Figure 8.1.

The area to the southwest (towards Jandakot Road) is within an area zoned 'Resource' under the City of Cockburn Town Planning Scheme No. 3 and 'Rural – Water Protection' under the Metropolitan Region Scheme. This area is currently being used to manufacture paving and landscaping products. The objective of the 'Resource' zone as stated in the City of Cockburn Town Planning Scheme No. 3 is *"to provide for the protection of the Perth Metropolitan underground water resource in accordance with the requirements of Statement of Planning Policy No. 6 published by the Western Australian Planning Commission on 12 June 1996"*.

The area to the east is within both the City of Cockburn (south of Acourt Road) and the City of Canning (north of Acourt Road). The affected area within the City of Canning boundary is reserved 'Parks and Recreation' under the Town Planning Scheme No. 40. It is also zoned 'Rural – Water Protection' and reserved 'Public Purposes: Special Use' under the Metropolitan Region Scheme. This area is/has been used for sand mining. The affected area within the City of Cockburn boundary is zoned 'Resource' under the City of Cockburn Town Planning Scheme No. 3 and 'Rural – Water Protection' under the Metropolitan Region Scheme. This area is a residential housing estate called Acourt Retreat that consists of 30 blocks, each approximately 2 hectares in size, approved for development in 2009. The ANEF incorporated in State Planning Policy 5.3 at the time of the Acourt Retreat development approval was ANEF 2025 (from Master Plan 2005), which showed the 30 ANEF contour running through the 11 westernmost blocks adjoining Johnston Road at the boundary of the airport. Accordingly, the development approval required the houses on those 11 blocks to be positioned outside of the ANEF 30 contour (although remaining within the ANEF 25 contour). Coincidentally, the endorsed Ultimate Capacity ANEF 30 Contour is in almost the same position within Acourt Retreat as it was in ANEF 2025, resulting in the houses located on

these 11 blocks remaining outside of the new Ultimate ANEF 30 Contour.

In this regard there are no residential houses located within the Ultimate Capacity ANEF 30 Contour. Furthermore, these areas are zoned appropriately under the respective local government town planning schemes, and the Metropolitan Region Scheme, to restrict the development of future residential houses.

8.2.5 AUSTRALIAN NOISE EXPOSURE INDEX

The Australian Noise Exposure Index (ANEI) contour map displays the estimated daily noise levels for actual movements over a 12 month period. The ANEI for Jandakot Airport is shown in Figure 8.2 and is based on the aircraft movements that occurred during the period 01 May 2012 to 30 April 2013.

Similar to the ANEF, the main changes between ANEI 2006 and ANEI 2012/2013 are largely as a result of the changes to the INM software modelling of helicopter operations. Financial year 2005/2006 was the busiest year on record for Jandakot Airport, resulting in the ANEI 2006 calculation representing daily noise exposure for a total of 406,147 annual aircraft movements. The ANEI 2012/2013 has a much lower movement volume of 252,106 annual aircraft movements, made up of 218,959 fixed-wing and 33,147 helicopter movements. Touch-and-go training circuits comprise 61% of the fixed-wing movements and 68% of the helicopter movements.

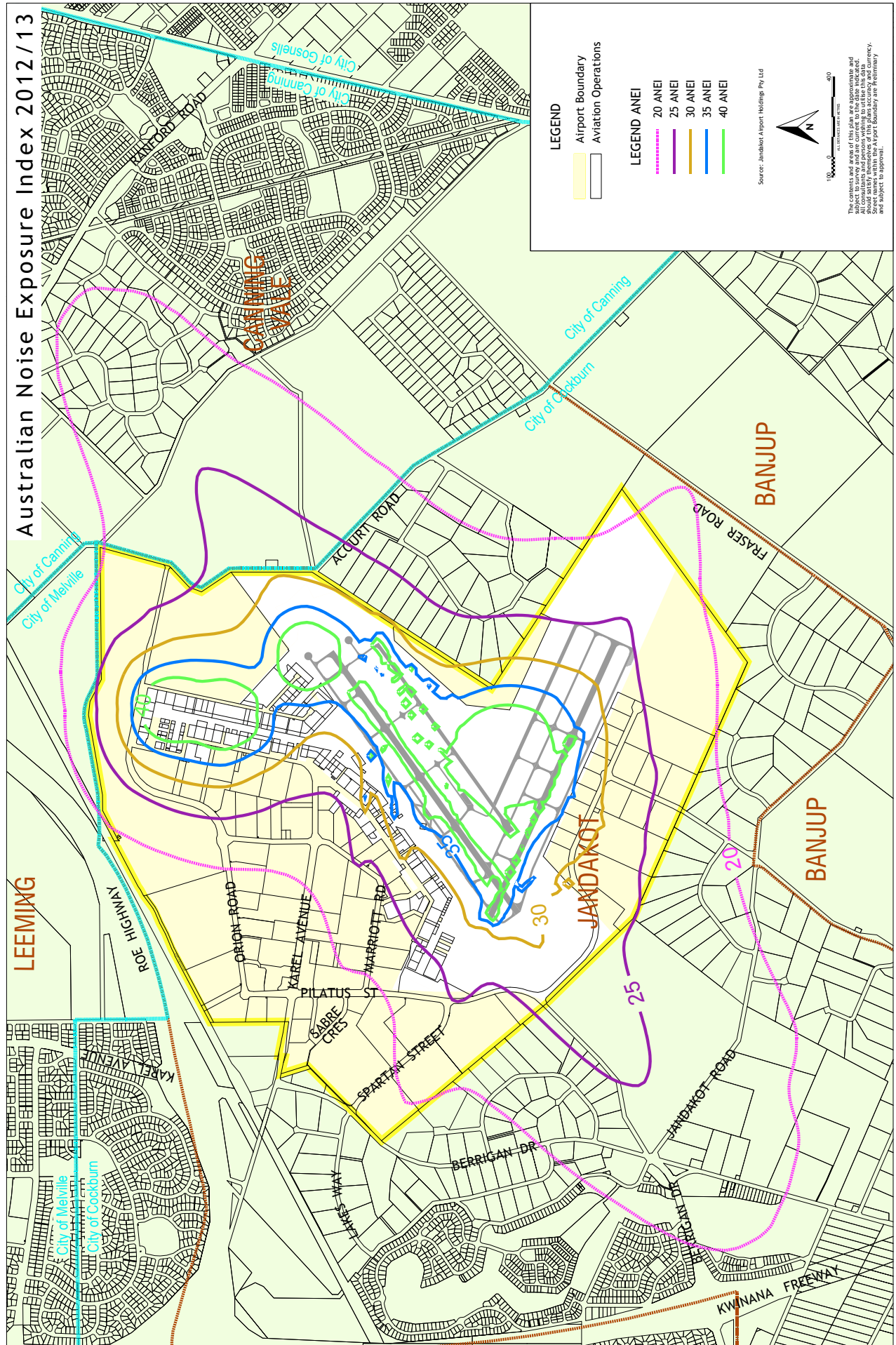
There are no material changes between the flight paths used for ANEI 2006 and ANEI 2012/13.

8.2.6 NOISE ABOVE CONTOURS

The NASF 'Guideline A: Measures for Managing Impacts of Aircraft Noise' acknowledges that the ANEF 20 and ANEF 25 zones do not capture all high noise affected areas around an airport and that Australian Standard AS2021 recognises that the ANEF contours are not necessarily an indicator of the full spread of noise impacts, particularly for residents newly exposed to aircraft noise.

The NASF was developed through the National Airports Safeguarding Advisory Group, which has recommended a review of Australian Standard AS2021 to consider inclusion of daily noise event criteria when considering zoning for noise-sensitive developments.

FIGURE 8.2 - AUSTRALIAN NOISE EXPOSURE INDEX



This noise metric is a frequency based measure of aircraft noise to present the projected number of aircraft noise events on an average day that are above a specific noise level, shown as a N70, N65 or N60 Contour chart.

The N70 Contours display the calculated average daily aircraft noise events above 70 decibels (dB(A)). A 70 decibel outside noise corresponds to a 60 decibel noise event indoors, which is the noise level specified in Australian Standard AS2021 as the indoor design sound level for normal domestic areas in dwellings that may interfere with activities such as normal conversation and watching television.

The N60 Contours display the calculated average daily aircraft noise events above 60 decibels. A 60 decibel outside noise corresponds to a 50 decibel noise event indoors, which is specified in Australian Standard AS2021 as the sleep disturbance level.

NASF Guideline A recommends that zoning for noise-sensitive development be avoided where noise modelling for the airport indicates either :

- 20 or more daily events greater than 70 dB(A);
- 50 or more daily events of greater than 65 dB(A);
or
- 100 events or more daily events of greater than 60 dB(A).

In addition, Guideline A suggests that measures for aircraft noise amelioration and restriction on noise sensitive development would be appropriate where there are more than 6 events predicted between the hours of 11pm to 6am which create a 60 dB(A) or greater noise impact.

The N60, N65 and N70 contours charts shown in Figures 8.3, 8.4 and 8.5 have been calculated using the ANEF ultimate capacity data, which is when Jandakot Airport will be operating at the maximum number of aircraft movements. Contours are shown in intervals from 10 average daily events up through to 700+ average daily events.

It is important to note that the Noise Above charts show the average daily noise events, calculated by dividing the total annual events by 365. For comparison purposes, N60 contours have also been prepared for a Busy Day. The N60 Busy Day diagram, included as Figure 8.6, depicts the projected amount of noise events for

a day where the airport will be operating at its peak daily movement level (i.e. extremely favourable weather conditions for flying training).

8.2.7 FLIGHT PATHS

The *Airports Act 1996* requires illustration of flight paths used to prepare the ANEF, ANEI and Noise Above Contours.

The flight paths used for the noise modelling present, as accurately as possible, the most frequently used flight tracks for current and future aircraft operations. The positioning and spread of these flight paths was determined through a comparison of the current published flight procedures and the highest density tracks identified in Airservices supplied Noise and Flight Path Monitoring System radar data, and then confirmed by local Air Traffic Control personnel as being representative of the current and expected future operations.

While illustration of set flight tracks is required for noise modelling, the actual flight tracks flown can vary substantially between aircraft. The majority of operations at Jandakot Airport are conducted under Visual Flight Rule conditions, whereby the pilots use visual landmarks to determine the flight path. The actual flight track flown is therefore affected by, but not limited to, factors such as the pilot's familiarity with the area, aircraft performance, air traffic management requirements, and meteorological conditions. Although the term 'flight path' is commonly used and the tracks are shown as thin straight lines on maps, in reality an aircraft's flight path occupies a three-dimensional region of space or set area and the resulting flight corridor can be a few kilometres wide.

Class D Airspace procedures allow aircraft to enter and leave the Jandakot Control Zone from any direction. However, due to the large volume of traffic at Jandakot Airport, Jandakot ATC requires aircraft to track via specific entry and exit points so that aircraft segregation and clearances can be appropriately managed by the Air Traffic Controllers. The depicted flight tracks show only the path to and from the specific entry and exit points due to aircraft being able to approach and depart the specific entry/exit points in and from any direction.

The preparation of the ANEF flight tracks has also included a number of assumptions. Airservices Australia has proposed a new Standard Instrument Departure

FIGURE 8.3 - N60 CONTOURS

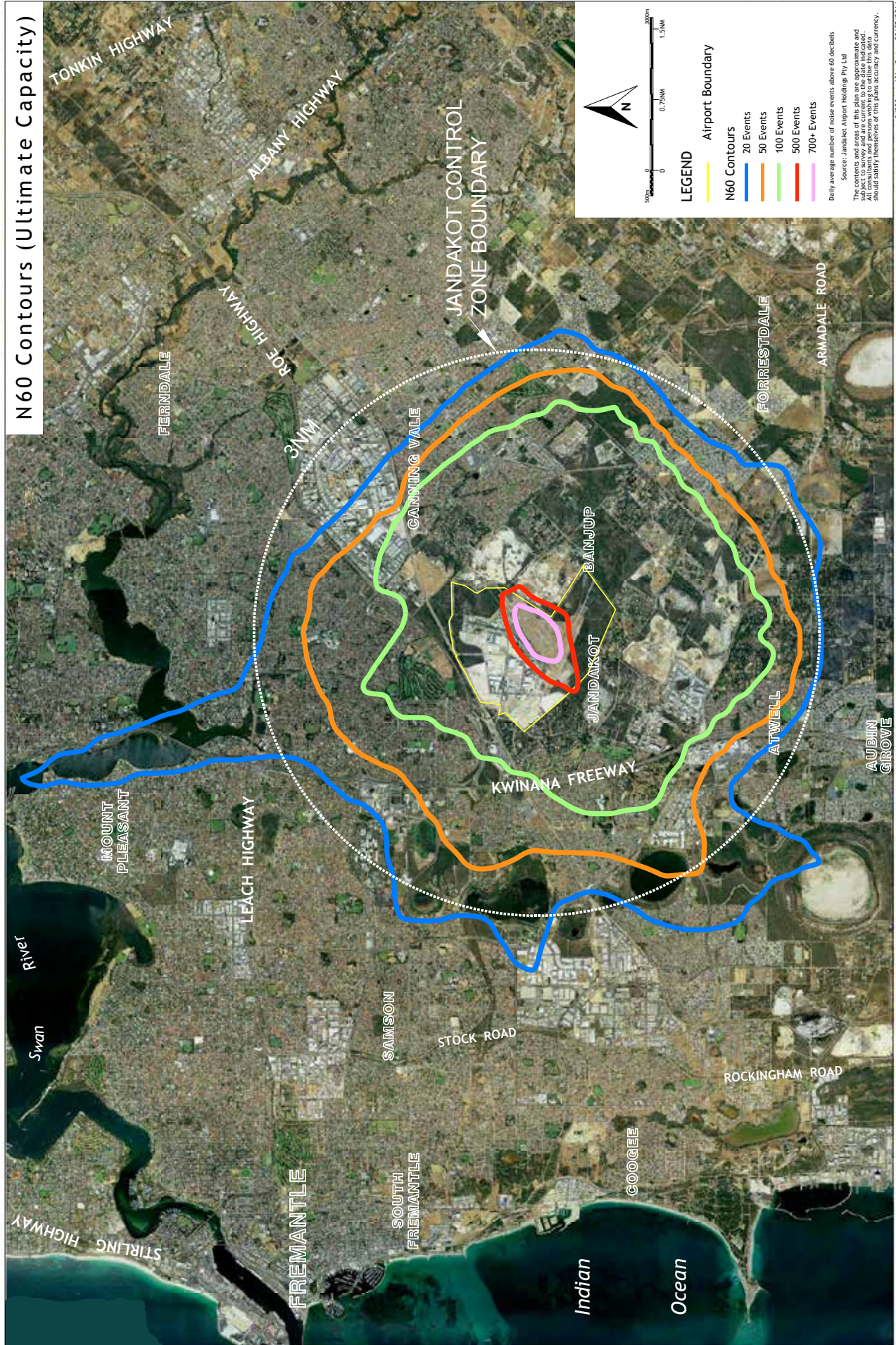


FIGURE 8.4 - N65 CONTOURS

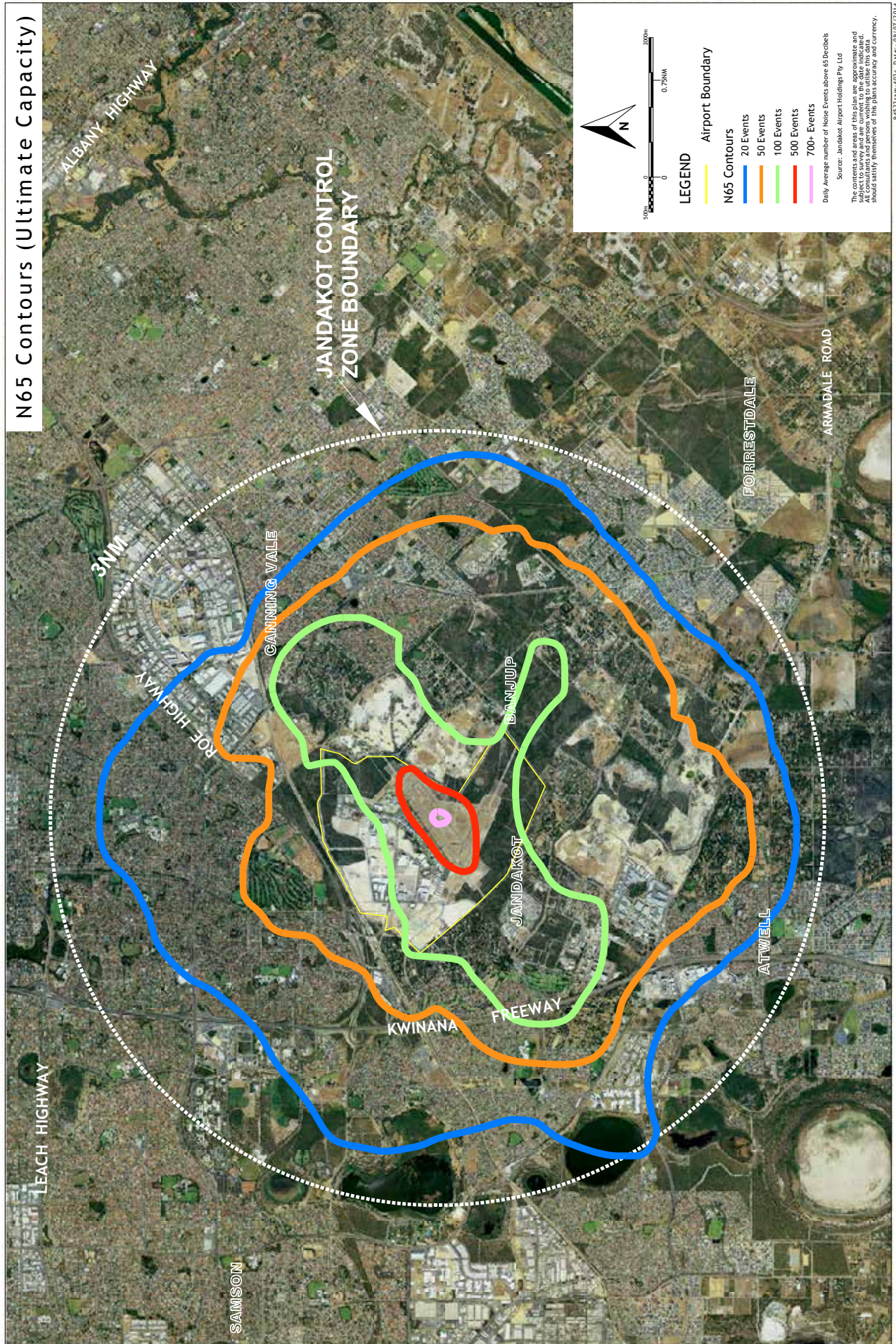


FIGURE 8.5 - N70 CONTOURS

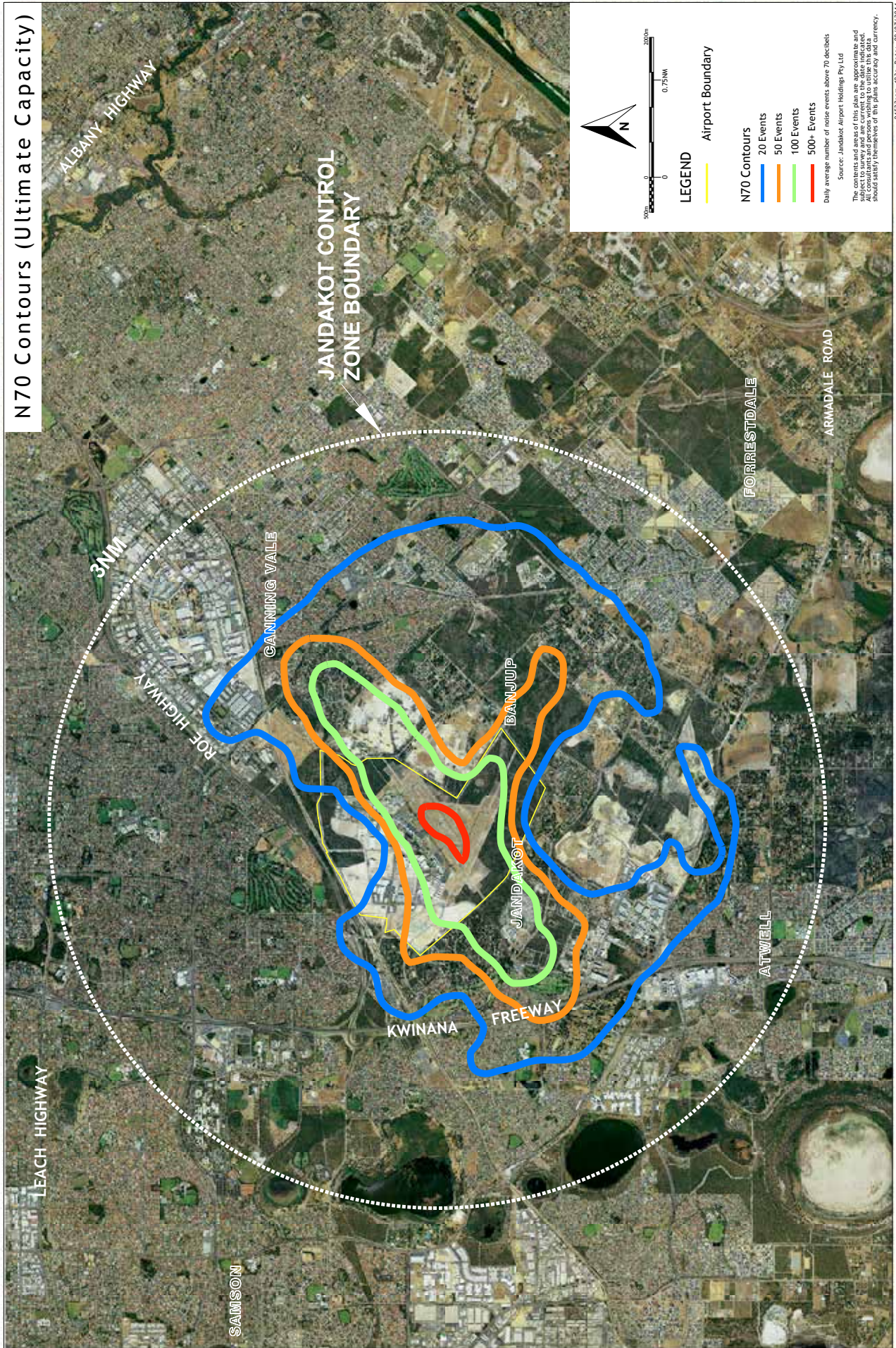
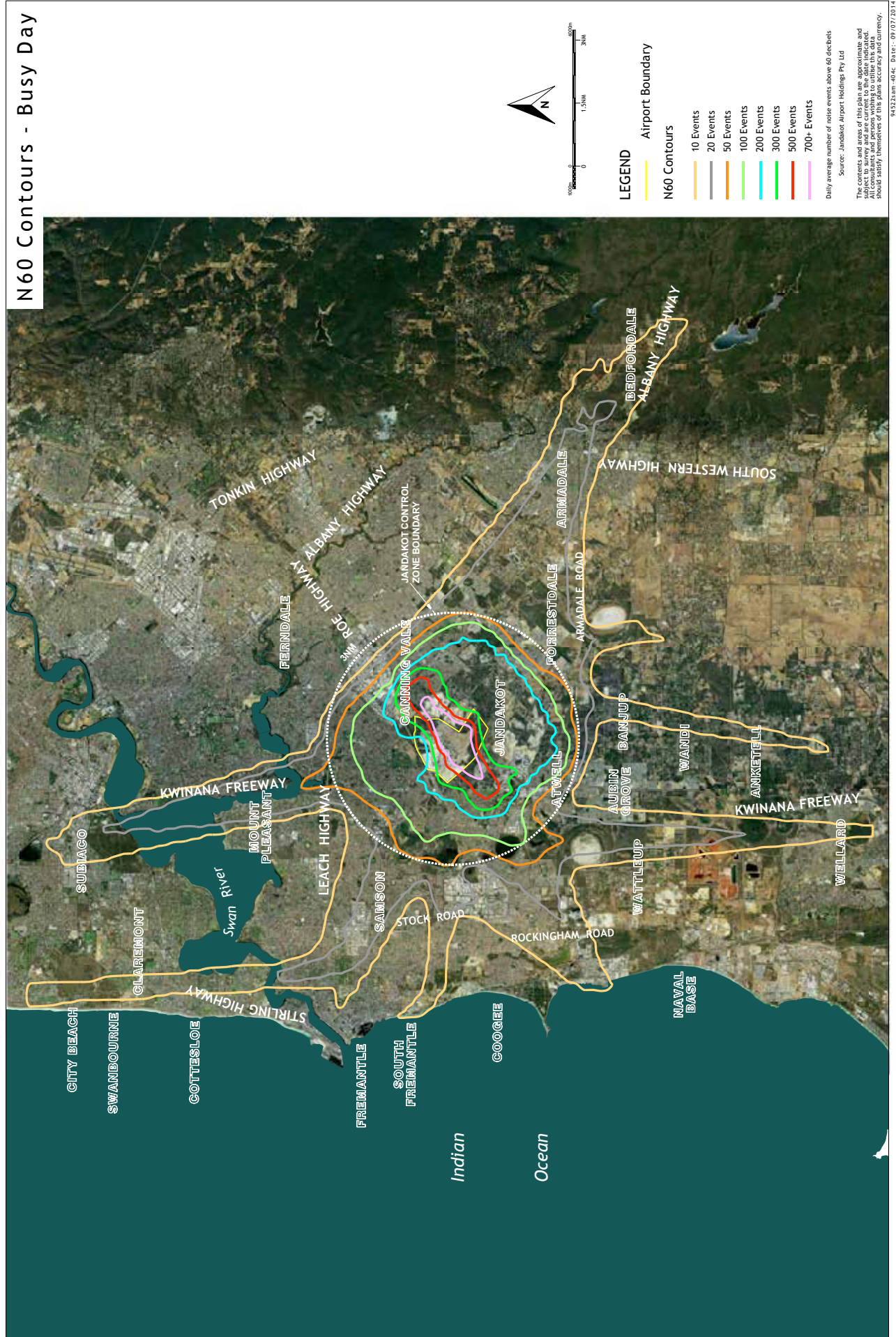


FIGURE 8.6 - N60 CONTOURS (BUSY DAY)



procedure to the south of Jandakot Airport. The proposed flight track used for the noise modelling is considered the most likely track configuration. However, it is acknowledged that the departure path may change during the detailed design phase if a different path is found to achieve better efficiency or noise outcomes. This proposed SID instrument departure will also be designed by Airservices for both NDB and GPS procedures, however, as they are very similar flight paths, no distinction is made between the tracks for the ANEF modelling.

Relocation of the NDB (see section 4.8.2) will also require reassessment of the two instrument procedures designed for NDB equipment. The NDB-B path from the north is used the majority of the time. The NDB-A path from the south is not frequently utilised. A comparison of the approaches between the current NDB and proposed NDB location show a degree of change less than 5% as the aircraft approaches to join the nominated circuit track. Therefore, the existing NDB flight tracks have not been amended for ANEF modelling purposes. It is noted that new aircraft are being fitted with GPS equipment that cannot interrogate an NDB, and the use of the NDB has a limited life span.

There are no changes to the existing published Visual Flight Rules routes or visual waypoints expected as a result of the implementation of this Master Plan.

Figures 8.7 – 8.14 show the anticipated flight paths used to calculate the ANEF.

8.3 AIRCRAFT NOISE MANAGEMENT

Aircraft noise management is the responsibility of the entire aviation industry.

COMMONWEALTH GOVERNMENT

The Australian Government is responsible for overall policy and legislation. The Department of Infrastructure and Regional Development advises the Government on the policy and framework for Australian airports and the aviation industry, manages the administration of the Government's interests in privatised airports under the *Airports Act 1996*, and provides policy advice to the Minister on the efficient management of Australian airspace and on aircraft noise and emissions.

STATE & LOCAL GOVERNMENTS

State and Local Governments are responsible for managing land-use planning around airports. State Planning Policy No. 5.3 - Jandakot Airport Vicinity and Draft SPP 5.3 (see Section 2.3.7) have been developed to protect Jandakot Airport from encroachment by incompatible land use and development, so as to provide for its ongoing, safe, and efficient operation, and to minimise the impact of airport operations on existing and future communities with particular reference to aircraft noise.

CIVIL AVIATION SAFETY AUTHORITY

The Civil Aviation Safety Authority is responsible for the safety regulation of civil air activities within Australia. This includes airspace regulatory functions such as setting flight path heights and distances, monitoring standards for holders of Air Operators Certificates and licences, including certifying that aircraft meet the noise standards, and assessing and approving changes to Australian airspace architecture.

AIRSERVICES AUSTRALIA

Airservices Australia is a government-owned corporation that is responsible for airspace management, aviation communications, radio navigation aids, aviation rescue and firefighting services, and aeronautical information.

Airservices manages complaints and enquiries about aircraft noise and operations through its Noise Complaints and Information Service. This service is the Australian aviation industry's main interface for the community on aircraft noise and related issues. Complaints and enquiries help identify issues of community concern and opportunities for delivering better noise outcomes for communities. Analysis of complaints and enquiries is used to identify systemic problems, provide guidance for government departments in developing aviation policy and provide other aviation agencies (such as the Civil Aviation Safety Authority) and industry bodies (such as airports) with information on community concerns.

In December 2008 Airservices introduced WebTrak, a publicly available internet-based program that allows members of the community to view information about aircraft arriving and departing Jandakot Airport from 40 minutes to three months ago. The system covering Jandakot Airport is based on the Noise and Flight Path

FIGURE 8.7 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 06 DAY

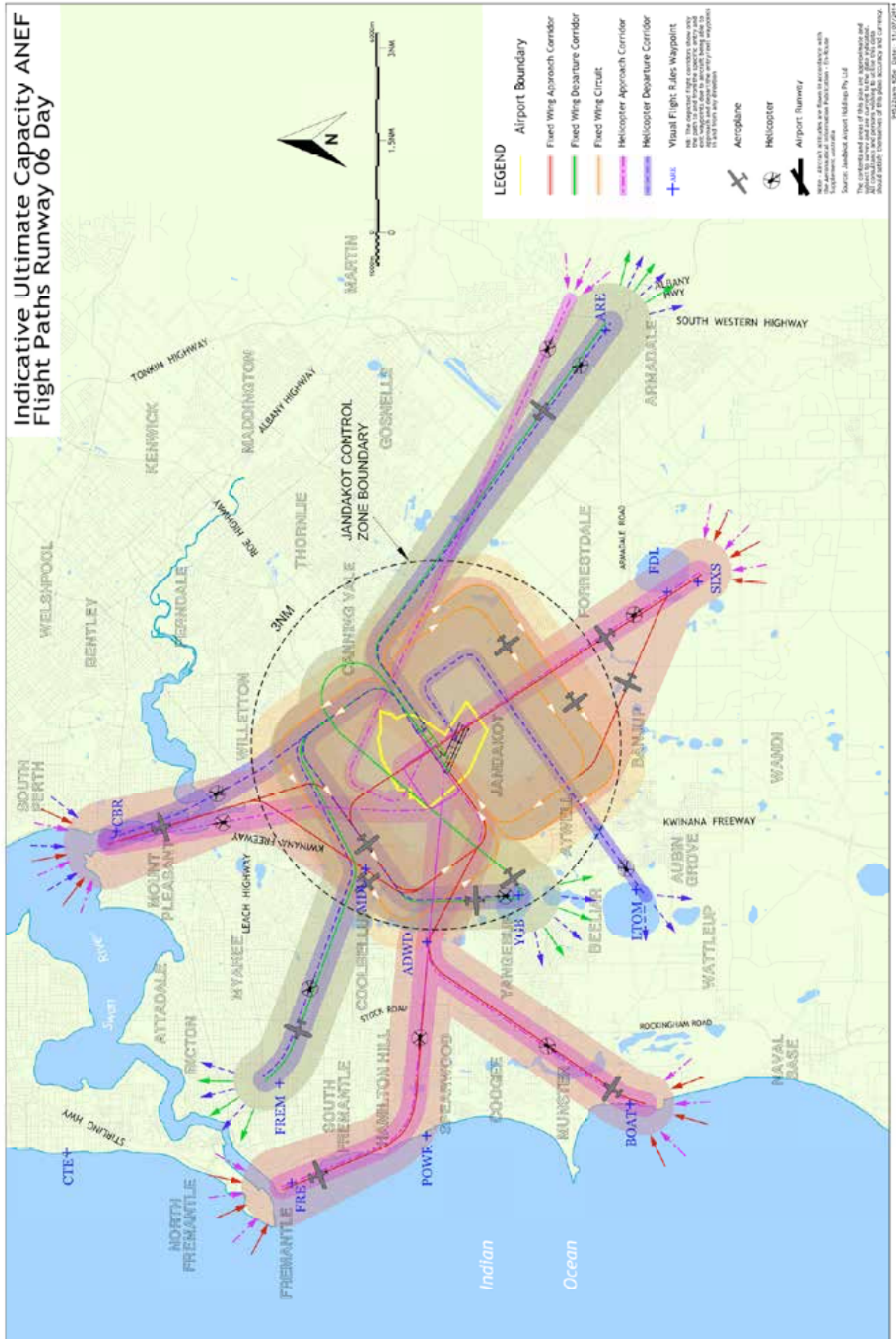


FIGURE 8.8 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 24 DAY

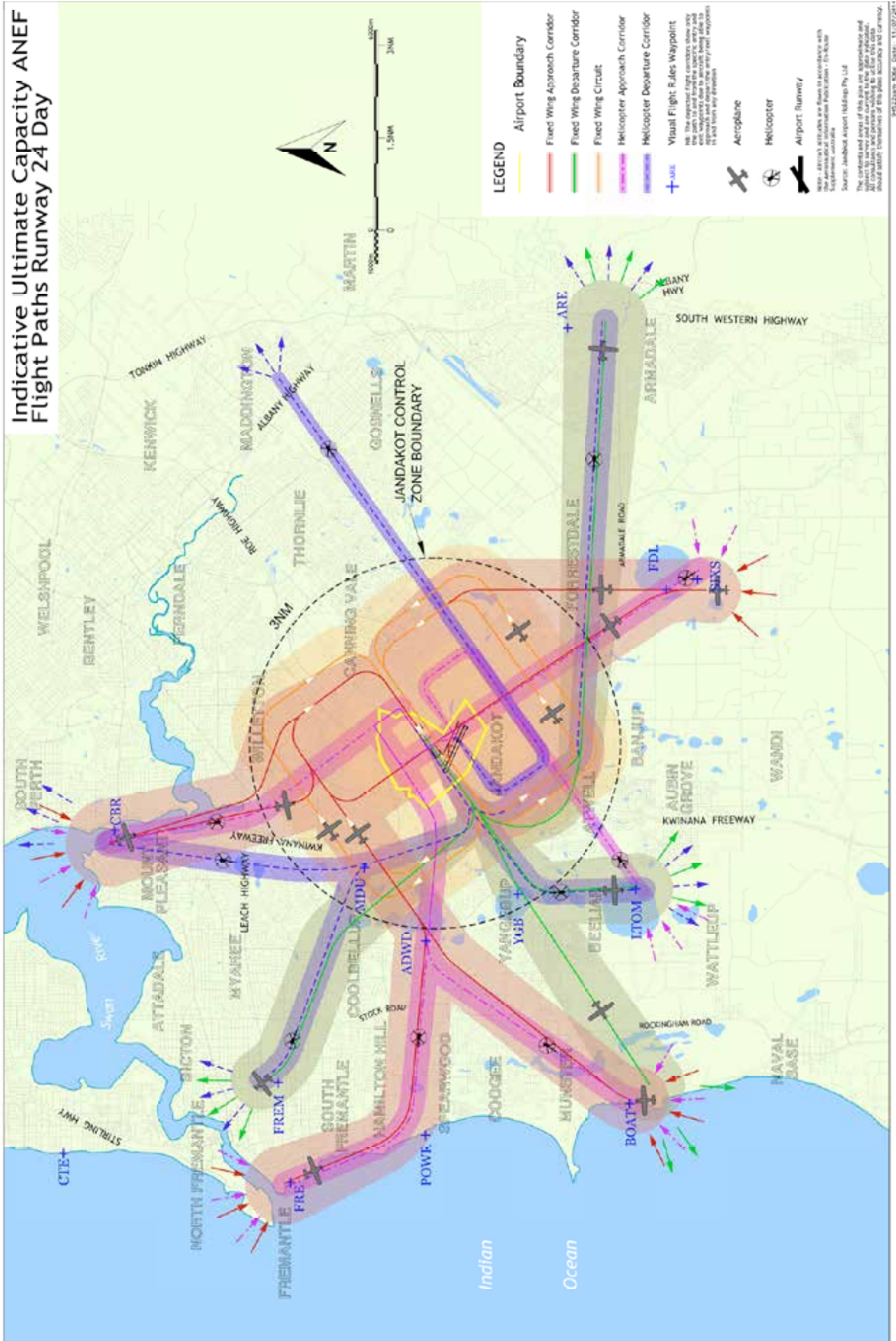


FIGURE 8.9 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 12 DAY

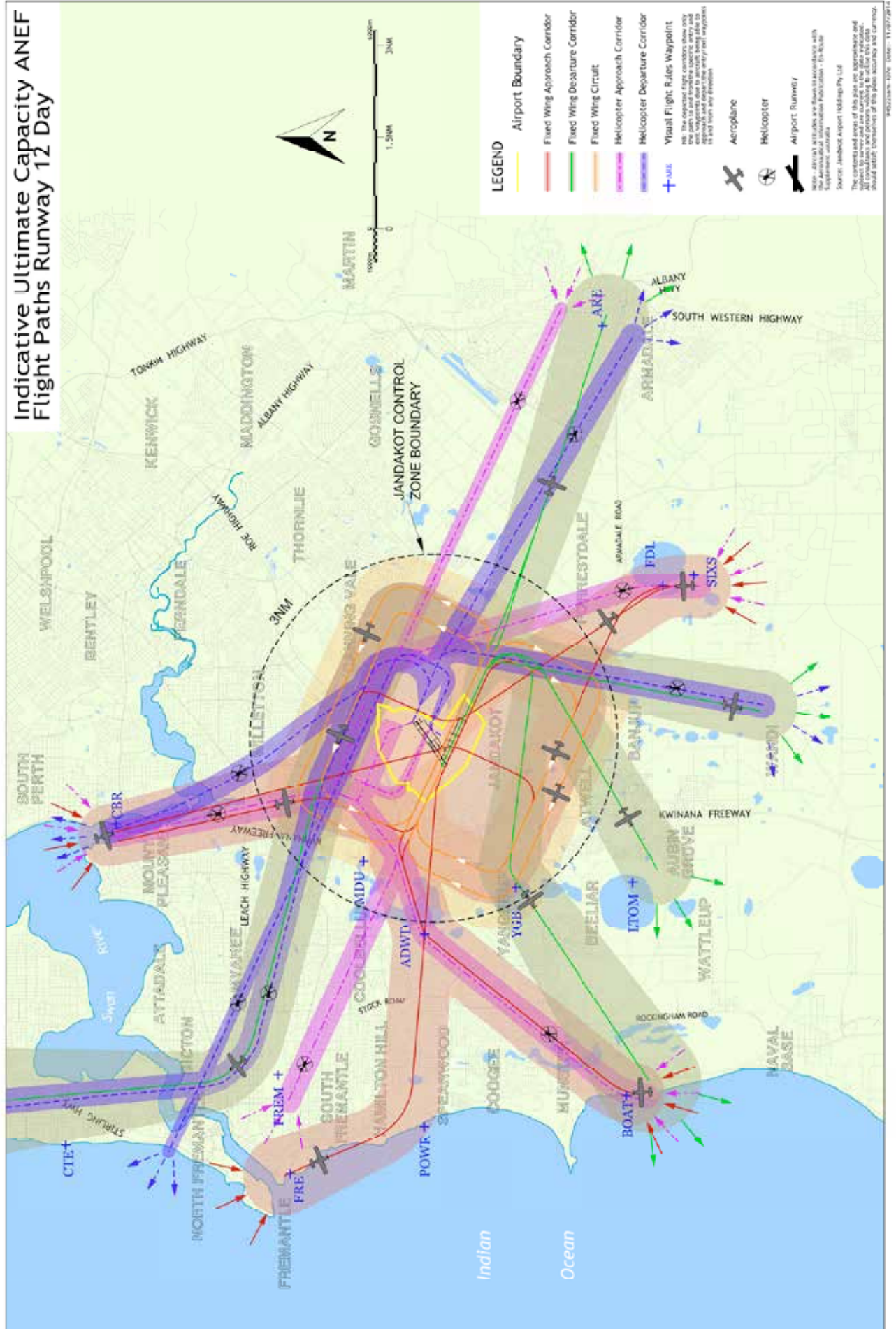


FIGURE 8.10 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 30 DAY

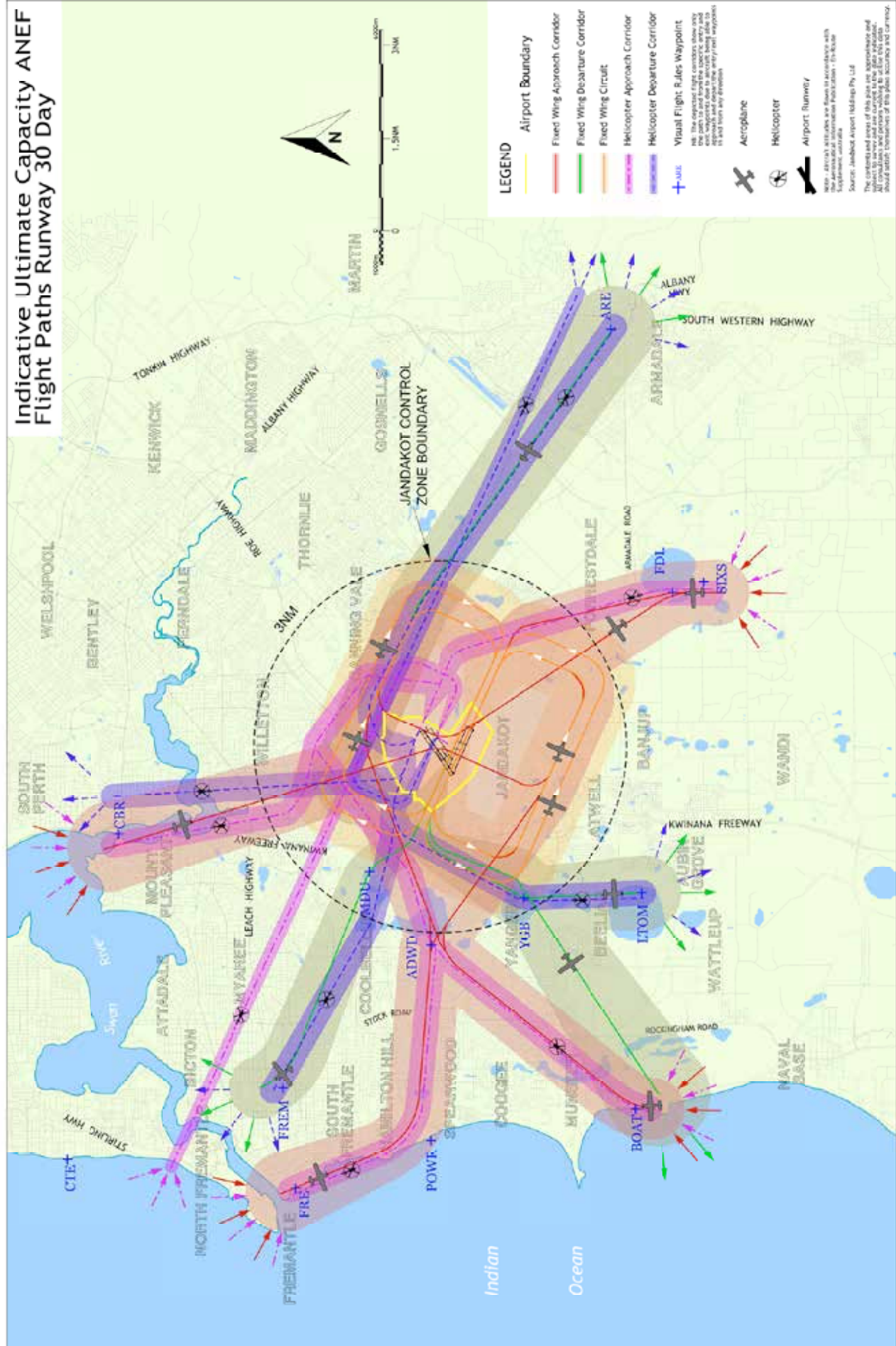


FIGURE 8.11 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 06 NIGHT

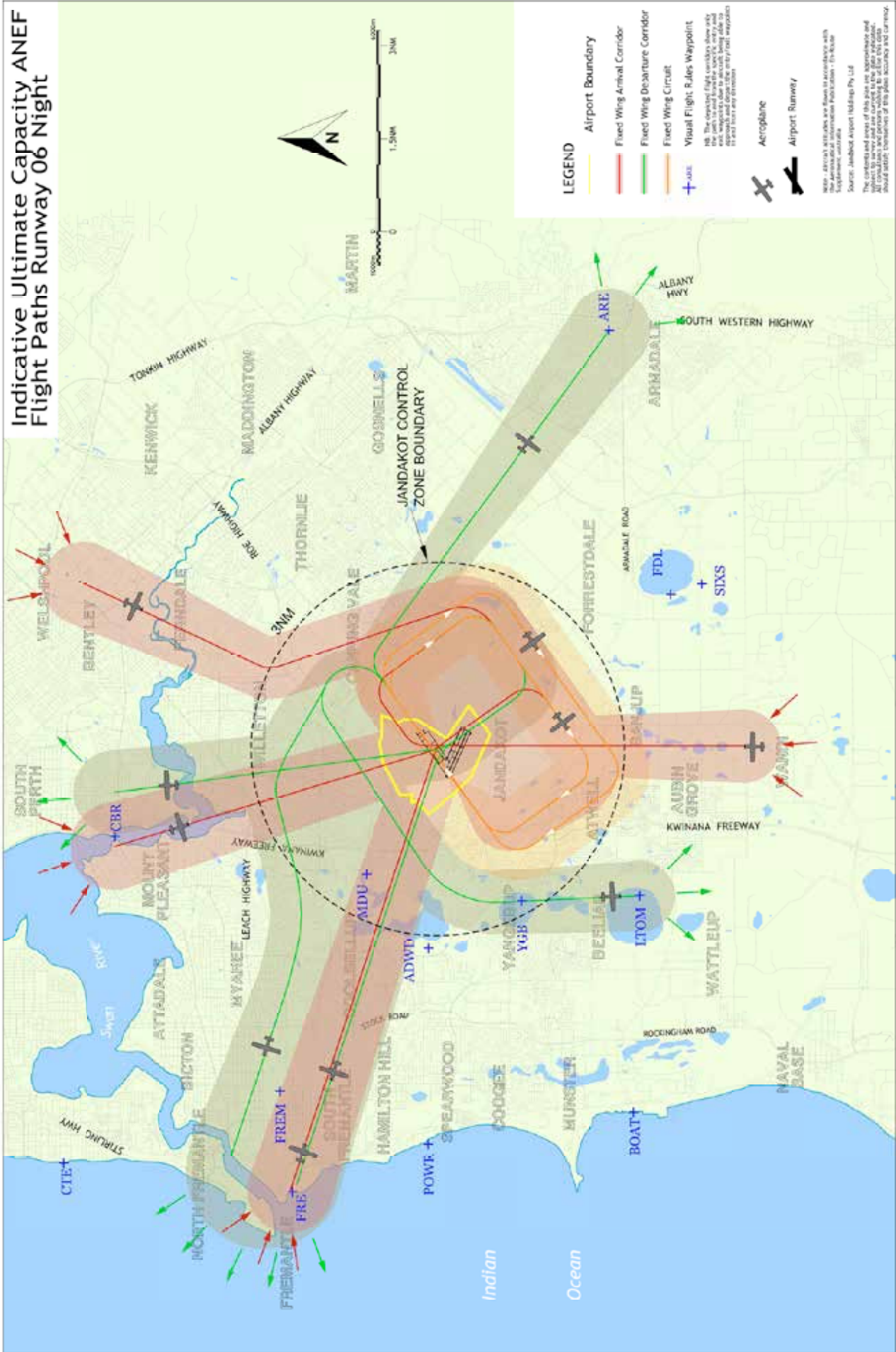


FIGURE 8.12 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 24 NIGHT

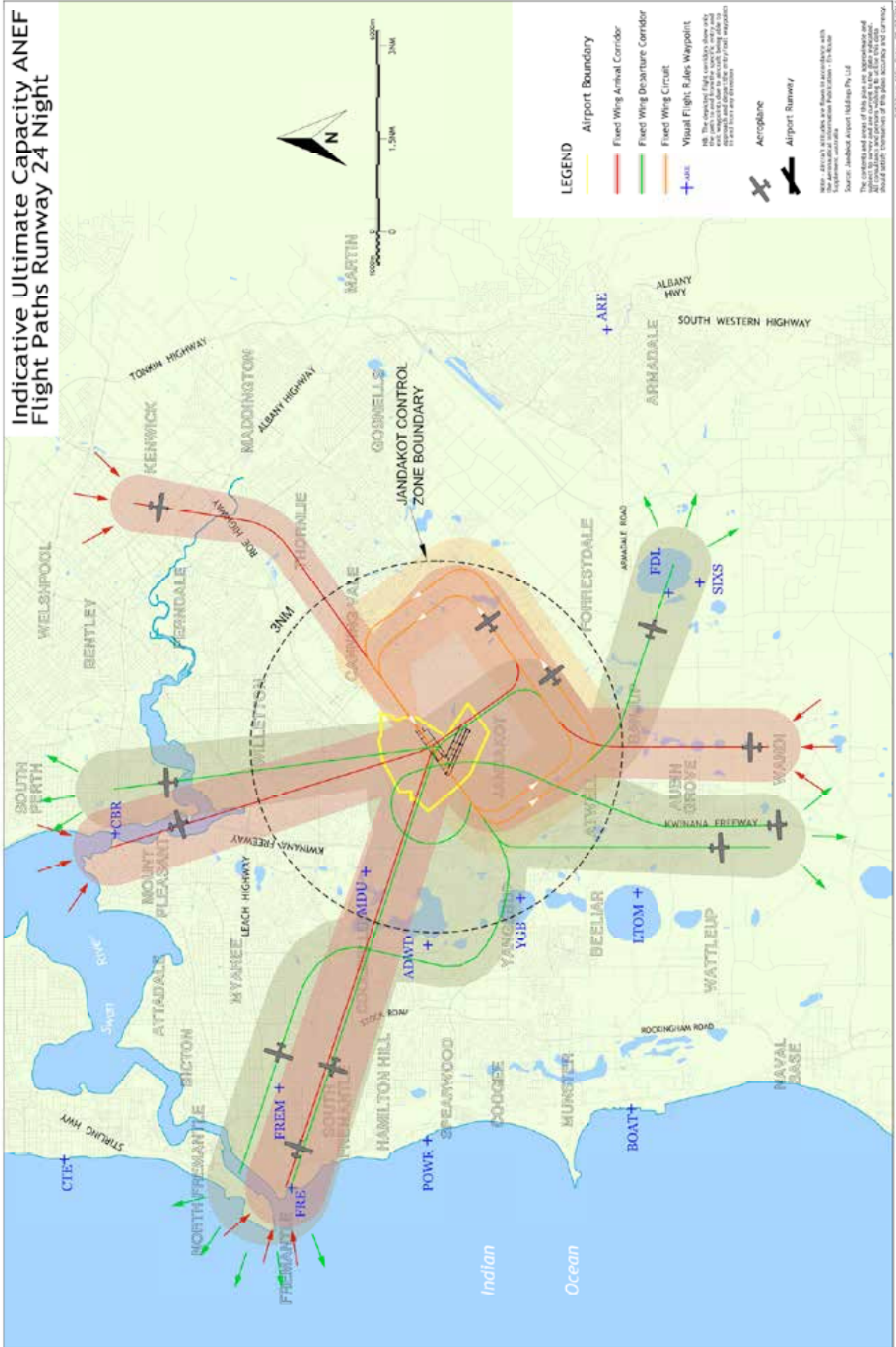


FIGURE 8.13 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 12 NIGHT

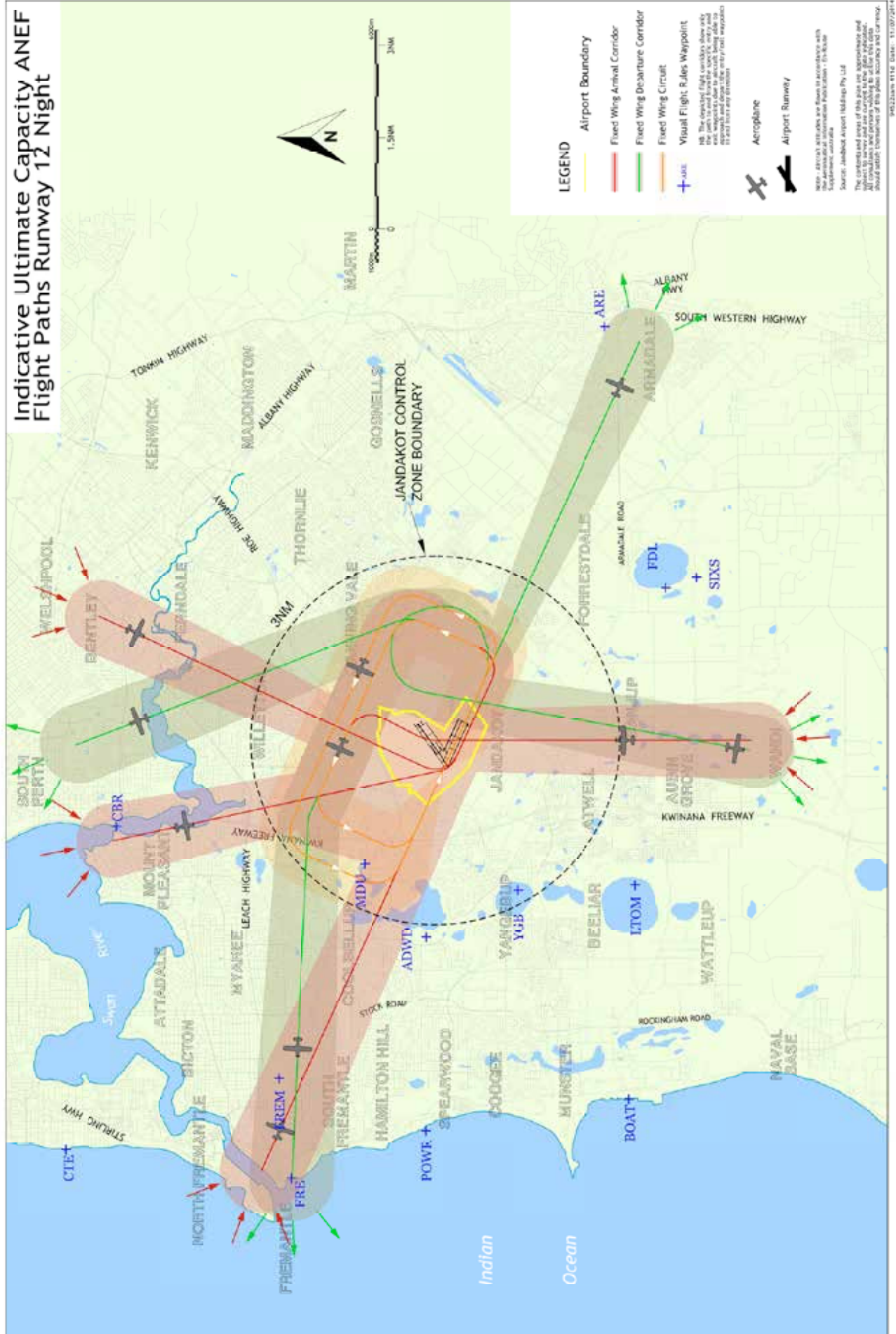
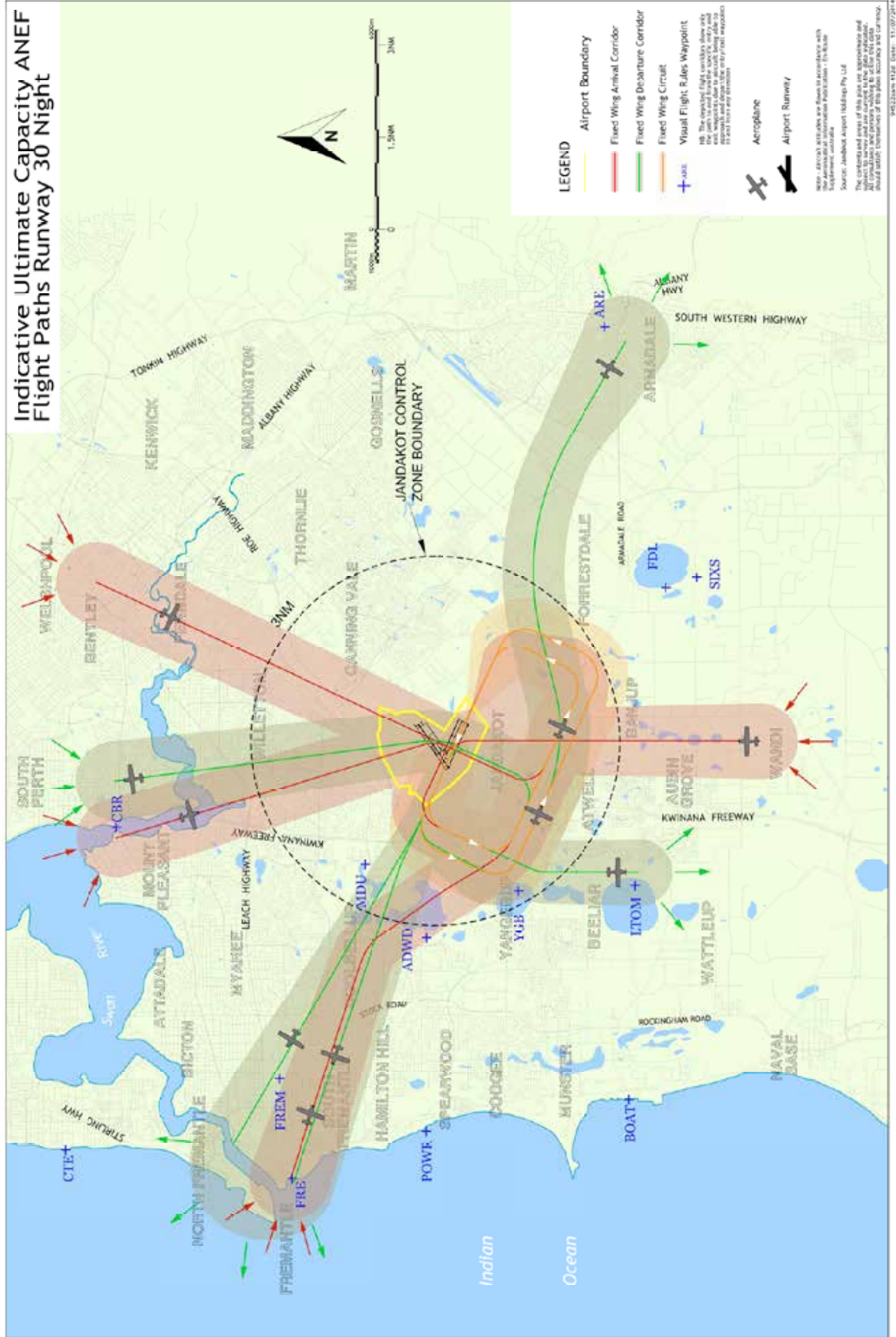


FIGURE 8.14 - INDICATIVE 2034 ANEF FLIGHT PATHS RUNWAY 30 NIGHT



Monitoring System for Perth Airport and uses traffic information recorded by Secondary Surveillance radars. As such, only aircraft with operating transponders are recorded. While carriage of transponders is not a mandatory requirement for aircraft operations within the Jandakot Airport Control Zone, the majority of aircraft based at Jandakot Airport are equipped with transponders and can therefore be viewed on WebTrak.

Airservices also produces quarterly Aircraft Noise Information Reports for major urban areas, including the Perth Basin which covers Perth, Jandakot and RAAF Pearce Airports. The reports include information and analysis on aircraft movements, noise monitoring and complaint issues.

Airservices Australia and the Australian Airports Association have established an aircraft noise website, www.aircraftnoise.com.au, to provide information on the causes of aircraft noise, how the aviation industry is working together to manage aircraft noise, and what people can do to reduce its impact.

AIRCRAFT NOISE OMBUDSMAN

The Aircraft Noise Ombudsman conducts independent administrative reviews of Airservices Australia's management of aircraft noise-related activities, including the handling of complaints or enquiries made to Airservices about aircraft noise, community consultation processes related to aircraft noise, and the presentation and distribution of aircraft noise-related information.

JANDAKOT AIRPORT HOLDINGS

Jandakot Airport only has direct control over the management of ground-based aircraft noise. Aircraft engines need to be tested during and/or following engine maintenance so that engineers can verify that the engines are working properly. The majority of aircraft based at Jandakot Airport have piston-engines which are also required to be tested by pilots prior to every flight. These pre-flight run-ups are only permitted in the designated run-up bays or in locations where the wind or distance helps minimise the carriage of noise off airport.

AIRCRAFT OPERATORS

Regardless of size, purpose or ownership, all civil aircraft operating in Australia must comply with the *Air Navigation (Aircraft Noise) Regulations 1984*. Aircraft operators are required to obtain an Aircraft Noise

Certificate, which must be reassessed if the aircraft is modified in any way which may affect its noise characteristics. Aircraft operators are also responsible for ensuring that noise abatement principles are adhered to.

8.3.1 PUBLICATION AND GUIDES

Noise abatement procedures for Jandakot and other Australian airports are published in En-Route Supplement Australia. The aerodrome information depicted in this publication is compiled and provided by Airservices and the airport operator for use by pilots and operators intending to operate aircraft at or in the vicinity of the aerodrome.

The Civil Aviation Safety Authority produces the Jandakot Airport Visual Pilot Guide. This guide, which is available from the CASA website, provides information about flight paths, noise abatement and operating procedures for pilots flying in and out of Jandakot Airport.

8.3.2 FLY NEIGHBOURLY

Fly Neighbourly is a voluntary code of conduct for pilots that was introduced at Jandakot Airport in January 2000. While it is impossible to stop aircraft noise emanating from an airport, Fly Neighbourly recognises that there are opportunities to reduce the effect of aircraft noise on surrounding communities.

The Fly Neighbourly programme focuses on pilot education, targeted through the co-operation of major operators, the use of signage and the inclusion of the Fly Neighbourly principles in the En-Route Supplement Australia pilot guide and the Jandakot Airport Conditions of Access & Use. Pilots are expected to undertake operations in a manner which is considerate of local residents. However, safety is the primary concern of air navigation and operations, and implementation of the Fly Neighbourly principles is therefore subject to safety and operational considerations as air traffic procedures and instructions must be complied with at all times.

The Fly Neighbourly principles are amended from time to time in consultation with local operators. In 2010, the circuit training hours were further restricted for operations on a Saturday. Training procedures were changed in March 2013 following a review of simulated engine failure practices, and in December 2013 aerobatic operations were introduced into Fly Neighbourly following consultation with Airservices

Australia and the Aircraft Noise Ombudsman's office. In early 2014 a workshop was held with local operators and representatives from Airservices, JAH and the Aircraft Noise Ombudsman's office to review the Fly Neighbourly principles and provide more detailed information to local communities about what is being done to minimise the impact of aircraft noise.

The revised Fly Neighbourly principles are detailed below. Information about Fly Neighbourly, including additional descriptions of the Fly Neighbourly statements, is available on the Jandakot Airport website.

Operators at Jandakot Airport will:

1. Comply with noise abatement procedures included in the Air Navigation Regulations, Departure Approach Procedures (DAP) and En-Route Supplement Australia (ERSA) guide, irrespective of Air Traffic Control Tower hours of operation.
2. Ensure that environmental awareness and noise management is included in pilot familiarisation and training.

Subject to Air Traffic Control and safety requirements, pilots will endeavour to:

GROUND OPERATIONS

3. Avoid lengthy engine run-ups and conduct non-pre-flight engine run-ups in designated areas or in locations where the wind or distance helps minimise the carriage of noise off airport.
4. Where practicable, small jet aircraft should be towed for start-up to a location that avoids causing jet-blast damage.

DEPARTURE

5. Use sufficient runway length and best rates of climb to maximise height over populated areas. High performance and twin-engine aircraft are to conduct full length take-offs where possible.
6. Minimise noise after take-off by reducing engine revs as much as possible.

IN FLIGHT

7. Maintain the published or Air Traffic Control cleared tracks after take-off. Where practicable, all instrument flight rule aircraft are to depart via the appropriate standard instrument departure.

8. Maintain required altitudes, particularly over residential housing. As much as possible, avoid flying over residential areas, hospitals and schools and maximise the use of flight paths over less densely populated areas such as water, forest and highways.

CIRCUIT TRAINING

9. Only conduct 'Touch & Go' circuit training between 0700-2230 Monday to Friday, and 0800-1800 Saturday and Sunday.
10. Fly circuits and conduct turns that minimise impact on residential areas.

SIMULATED ENGINE FAILURE

11. Fixed wing aircraft must conduct simulated engine failures over the runway with recovery initiated prior to the airside boundary.

AEROBATICS

12. Perform aerobatics at least 600m laterally seaward off the coastline or away from residential areas when over land.

TRAINING AREA

13. When operating to, from and within the Training Area (D104), avoid populated areas where possible. After leaving Jandakot Class D Airspace, climb to the highest practicable level below the base of controlled airspace.

HELICOPTERS

14. Use correct take-off and landing areas to minimise the effects of rotor wash.
15. Minimise tight manoeuvres and turns, and avoid hovering, when operating over populated areas where possible.
16. Minimise rotor blade slap noise and utilise descent profiles with low-power and low-noise operations.

8.3.3 JANDAKOT AIRPORT COMMUNITY AVIATION CONSULTATION GROUP

The Jandakot Airport Community Aviation Consultation Group (CACG) is an independent committee established to provide a forum for appropriate community engagement on airport planning and operations. The Jandakot Airport CACG comprises representatives from Federal, State and Local Governments, Airservices Australia, Jandakot Airport

Holdings, aircraft operators, and local community groups.

The role and purpose of the CACG is to enable residents affected by airport operations, JAH, aviation operators at the airport, local authorities, airport users, and other interested parties, to exchange information on issues relating to the operation of Jandakot Airport and its impacts. The CACG meets on a quarterly basis and minutes of the meetings are published on the Jandakot Airport website.

8.3.4 NOISE INFORMATION

Experience suggests that those people who are aware of aircraft noise before they move to an area tend to have a higher tolerance than those who were unaware that an airport is nearby. Providing information on aircraft noise impacts and aircraft operating procedures to the surrounding community has proven to be an effective tool in the management of aircraft noise issues.

The Jandakot Airport website was upgraded in March 2013, and the Aircraft Noise webpage was significantly amended to provide detailed information and related links on topics such as aircraft noise impacts, aircraft noise modelling, which organisations are responsible for managing aircraft noise, what is being done, and what affected residents can do. The Aircraft Noise webpage has been receiving an average of 100 unique page views per month.

8.4 AIRSPACE PROTECTION

8.4.1 PRESCRIBED AIRSPACE

The Department of Infrastructure and Regional Development protects the airspace around leased Federal airports under the *Airports Act 1996* and the *Airports (Protection of Airspace) Regulations 1996*. Obstructions and obstacles in the vicinity of an airport have the potential to create air safety hazards and to seriously limit the scope of current and future aviation operations into and out of an airport. Whilst the protection of airspace is applied to all stages of flight, it is most critical for arrivals and departures at any airport. During these stages, the aircraft is close to the ground, the pilot's workload is greatest and the aircraft is least manoeuvrable. Since the majority of aircraft accidents occur during these stages, the objective is to provide a safe, predictable environment in which aircraft can land and take-off.

International and national standards have been adopted that define two sets of invisible surface to delineate the various airspace obstacle protection areas: the Obstacle Limitation Surface, and Procedures for Air Navigation Services - Aircraft Operations surfaces. Prescribed airspace is the airspace above any part of either of these surfaces.

8.4.2 OBSTACLE CONTROL

Any activities that could result in an intrusion of prescribed airspace are referred to as 'controlled activities' that can only be carried out with approval. Controlled activities include:

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

Under the *Airports (Protection of Airspace) Regulations 1996*, details of proposed controlled activities must be provided to JAH as the airport-operator company. JAH will complete an initial assessment to determine whether the activity will cause an intrusion into the prescribed airspace for Jandakot Airport and the extent of any intrusion. If there is an intrusion, JAH is required to seek further assessment from Airservices and the Civil Aviation Safety Authority. These comments will then be provided to the Department of Infrastructure and Regional Development to approve/refuse the controlled activity. Controlled activities that are less than 3 months duration may be approved by JAH following assessment by Airservices and the Civil Aviation Safety Authority.

8.4.3 OBSTACLE LIMITATION SURFACE

The Obstacle Limitation Surface (OLS) is a defined area of airspace designed to provide protection for visual flying operations, where the pilot is flying by sight. The OLS identifies the conceptual surfaces which have been determined to be the lower limits of the airspace requirements for aircraft operations in visual flight conditions.

It is possible to have some penetration of the OLS provided that approval is granted to operate with appropriate risk mitigation measures in place.

JAH, as the aerodrome operator, is required to establish the OLS in accordance with MOS Part 139. The construction of the fourth runway has been included in Master Plan 2005 and Master Plan 2009. Master Plan 2009 also provided for the lengthening of runways 12/30 and 06L/24R. As an OLS is prepared for each Master Plan, the OLS airspace requirements for the fourth runway have been identified and protected since 2005 and the airspace requirements for the lengthening of runways 12/30 and 06L/24R have been protected since 2009. Figure 8.15 depicts the OLS for the ultimate development of the Jandakot Airport.

8.4.4 PROCEDURES FOR AIR NAVIGATION SERVICES – AIRCRAFT OPERATIONS (PANS-OPS)

Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) is a second defined area of airspace, usually positioned above the OLS surface, which protects aircraft operating in instrument flying conditions whereby the pilot is relying entirely on the information derived from cockpit navigation instruments.

These surfaces are established by instrument procedure designers approved by CASA under Civil Aviation Safety Regulations Part 173. These surfaces ensure that an aircraft will have a specified minimum clearance above any accountable obstacle. Since the PANS-OPS are a function of the underlying obstacle environment, no penetrations are permitted.

PANS-OPS surfaces may also include protection of the airspace around navigation aids that are required for instrument flying activity.

A review of the PANS-OPS was undertaken for Master Plan 2009 to include the runway extensions of runways 06L/24R and 12/30. The fourth runway will not facilitate instrument procedures and therefore does not affect the PANS-OPS. A further PANS-OPS review has been undertaken to assess the relocation of the Non-Directional Beacon (see Section 4.8.2) and to include a new standard instrument departure. The new standard instrument departure has been proposed by Airservices to facilitate instrument flight rule (IFR) departures to the south from any primary runway direction. The proposed instrument departure will utilise existing flight tracks to the south and will avoid the delays for aircraft currently looking to enter Perth Controlled Airspace.

Figure 8.16 depicts the PANS-OPS surfaces for the ultimate development of the Jandakot Airport and is provided as a guide only to obstacle management within the vicinity of the airport. Obstacles recognised as being close to the surface limits identified are to be referred to a suitably qualified designer for accurate assessment.

8.5 EXTERNAL LIGHTING RESTRICTIONS

The Civil Aviation Safety Authority has the authority, under the *Civil Aviation Regulations 1988*, to control ground lights where they have the potential to cause confusion or distraction (from glare) to pilots in the air. CASA has established guidelines, through the Manual of Standards Part 139, on the location and permitted intensities of ground lights within a 6km radius of airports.

Figure 8.17 depicts the Restricted Light Zones with respect to the proposed extensions of Jandakot Airport's two lit runways (06L/24R and 12/30). The four light control zones reflect the degree of interference ground lights can cause as a pilot approaches to land.

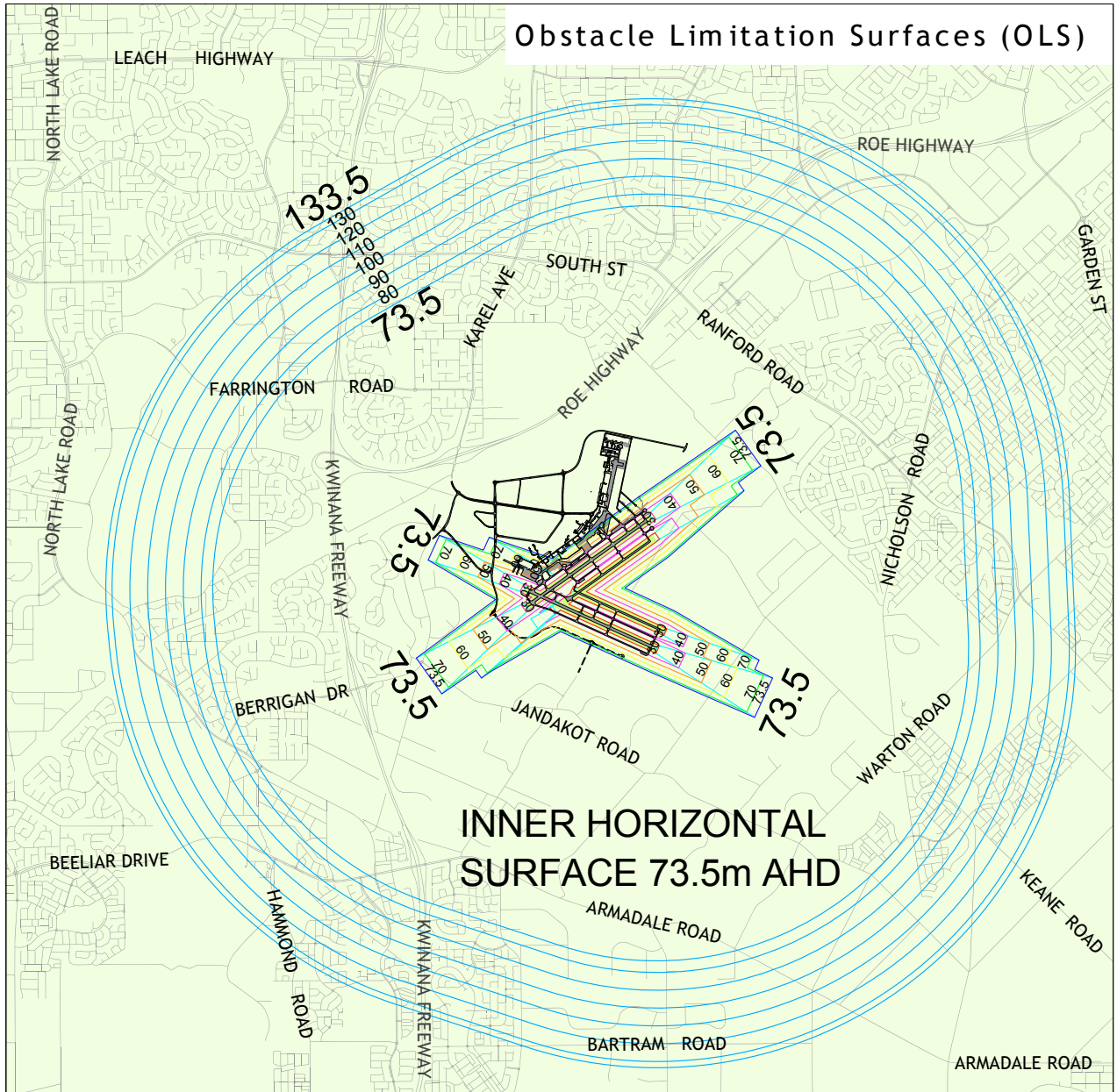
The existence of a certain type of light fitting is not necessarily an indication that more lights of the same type can be added to the same area. It is important that the NASF 'Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of the Airport' guidelines are consulted or CASA advice sought when new sources of significant lighting (such as freeway, construction or stadium flood lighting) is being planned in the vicinity of airports.

8.6 WINDSHEAR AND TURBULENCE

The location of a significant obstacle, such as a building, in the path of a cross-wind to an operational runway can pose a safety risk to aircraft operations by creating windshear and turbulence. The National Airports Safeguarding Framework 'Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports' notes that windshear poses the greatest risk on approach, landing and take-off when the aircraft's speed is low and pilot's ability to respond is limited.

JAH applies the Guideline B criteria to proposed developments to determine whether there is a potential for windshear from proposed developments to affect aircraft movements.

FIGURE 8.15 - OBSTACLE LIMITATION SURFACE



RWY	CATEGORY	APPROACH SURFACES						TAKE-OFF CLIMB SURFACES						
		ORIGIN (CHGE)	HEIGHT (m)	INNER EDGE WIDTH (m)	DIVERGENCE (%)	SLOPE (%)	LENGTH (m)	TRANSITION (%)	ORIGIN (CHGE)	HEIGHT (m)	INNER EDGE WIDTH (m)	DIVERGENCE (%)	SLOPE (%)	LENGTH (m)
08L X	2 I/NP	470	28.6	90	15	3.33	2500	20	2190	28.6	80	10	4	2500
08R E	2 NI	810	28.5	90	10	4	2500	20	2050	28.6	80	10	4	2500
24L E	2 NI	2090	28.6	80	10	4	2500	20	708	29.4	80	10	4	2500
24R X	2 I/NP	2190	28.6	90	15	3.33	2500	20	470	28.8	80	10	4	2500
12L P	2 NI	1820	28.7	80	10	4	2500	20	2930	29.6	80	10	4	2500
12R E	2 NI	1302	28.4	90	10	4	2500	20	2930	29.6	80	10	4	2500
30L X	2 I/NP	2930	29.6	90	15	3.33	2500	20	1302	28.4	80	10	4	2500
30R P	2 NI	2930	29.6	80	10	4	2500	20	1820	28.7	80	10	4	2500

NOTES:

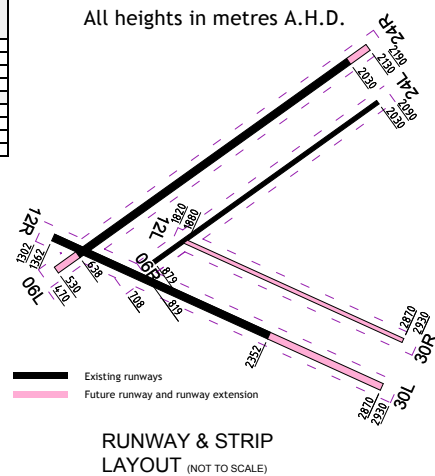
- 1 LEVEL DATUM ADOPTED – 28.5m AHD.
- 2 INNER HORIZONTAL SURFACE – RADIUS 3500m FOR CODE 2 INSTRUMENT RUNWAYS, 45m ABOVE LEVEL DATUM.
- 3 CONICAL SURFACE – SLOPE 5% TO 60m ABOVE INNER HORIZONTAL SURFACE FOR CODE 2 INSTRUMENT RUNWAYS.
- 4 TABLE ABBREVIATIONS
 E – EXISTING RUNWAY
 X – EXTENDED RUNWAY
 P – PROPOSED RUNWAY
 2 I/NP – INSTRUMENT/NON-PRECISION CODE 2

LEGEND

Airport Boundary

Source: Jandakot Airport Holdings Pty Ltd

The contents and areas of this plan are approximate and subject to survey and are current to the date indicated. All consultants and persons wishing to utilise this data should satisfy themselves of this plan's accuracy and currency.



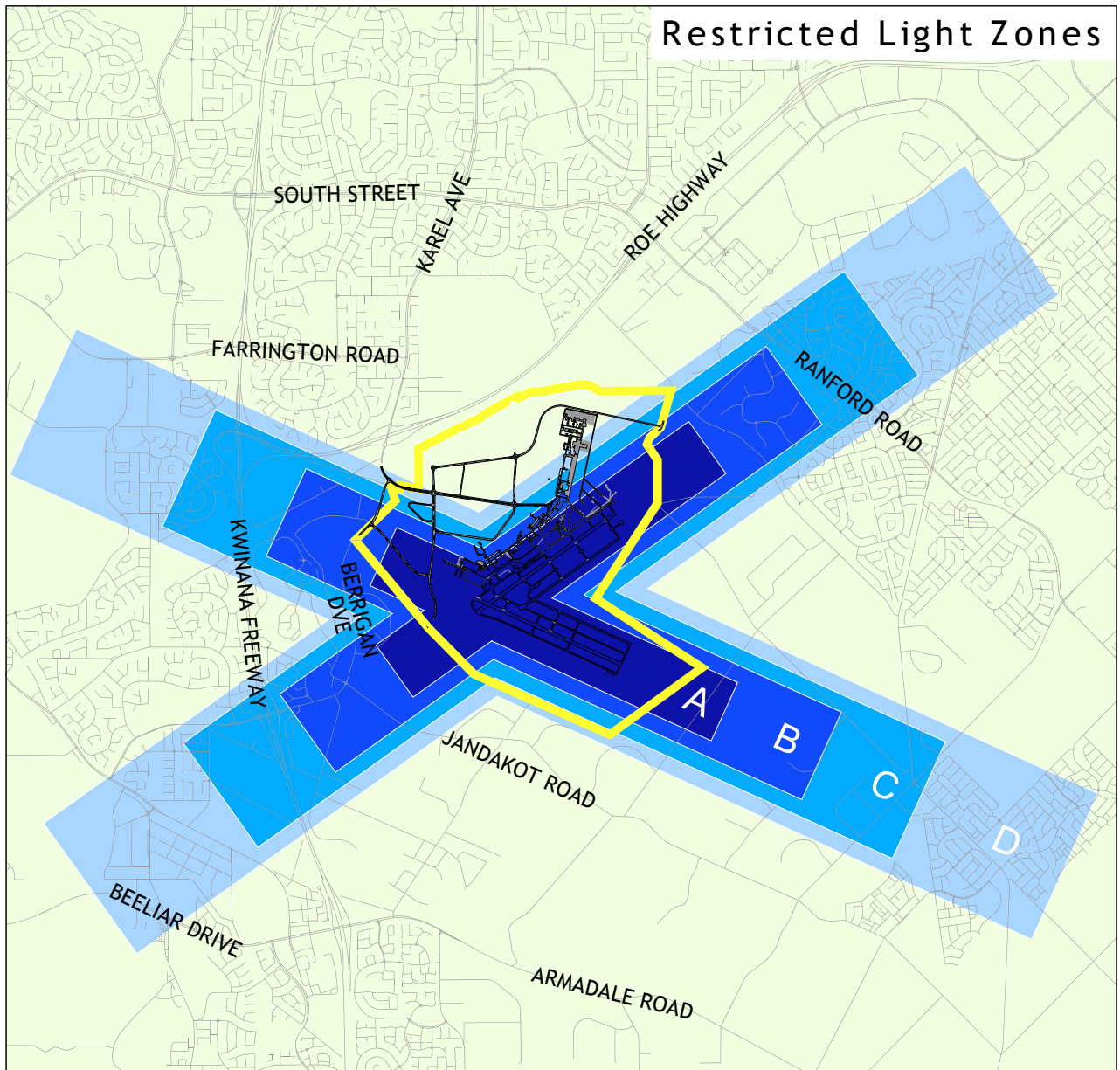
Existing runways
 Future runway and runway extension

RUNWAY & STRIP LAYOUT
 (NOT TO SCALE)

FIGURE 8.16 - PROCEDURES FOR AIR NAVIGATION SERVICES - AIRCRAFT OPERATIONS




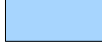


FIGURE 8.17 - RESTRICTED LIGHT ZONES



LEGEND

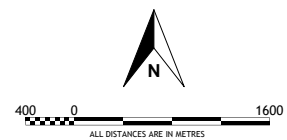
MAXIMUM INTENSITY OF LIGHT SOURCES MEASURED AT 3 DEGREES ABOVE THE HORIZONTAL

ZONE A		0 cd
ZONE B		50 cd
ZONE C		150 cd
ZONE D		450 cd

REFER MANUAL OF STANDARDS PART 139 SECTION 9.21

 Airport Boundary

Source: Jandakot Airport Holdings Pty Ltd



The contents and areas of this plan are approximate and subject to survey and are current to the date indicated. All consultants and persons wishing to utilise this data should satisfy themselves of this plans accuracy and currency.

94522sam-147f Date:- 10/07/2014

8.7 WILDLIFE HAZARD MANAGEMENT

Birds and other animals can pose a serious safety risk to aircraft operations. JAH is required to monitor and control the presence of birds and animals on, or in the vicinity, of the airport in accordance with the Civil Aviation Safety Regulations Part 139. JAH has a Wildlife Hazard Management Plan that defines the methods applied to control birds and animal hazards on airport, as well as a Feral Animal Management Plan to address overabundant native species. These control measures include permanent and temporary fauna exclusion fencing, vehicle harassment and the use of bird-frite (shotgun cartridge) for both bird and macropod management within the aircraft manoeuvring area, and managing features of the airport and its surrounds that are attractive to problem bird and animal species.

Monitoring of animal and bird hazards is continually carried out to identify habitats and numbers, with seasonal expert advice sought when necessary. When required, Notices to Airmen (NOTAM) are issued to notify aircraft operators of increased bird or animal hazards. Under the *Air Navigation Act 1920*, aircraft bird and animal strikes are classified as an air safety incident and must be reported to the Australian Transport Safety Bureau.

The National Airports Safeguarding Framework 'Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports' acknowledges that new land uses in the vicinity of an airport can significantly influence the risk of wildlife hazards to aircraft operations. Management of activities that may be wildlife attractant are addressed through Operational Environmental Management Plans that are required to be prepared for all new and existing developments within the airport site. When required, approaches are made to local councils to discuss external planning or developments that may increase bird and animal hazards at the airport, such as the location of rubbish tips.

8.8 COMMUNICATION, NAVIGATION AND SURVEILLANCE INFRASTRUCTURE

Airservices Australia provides and maintains a Non-Directional Beacon at Jandakot Airport to facilitate location navigation for aircraft arrivals and departures. In addition, a microwave communication link exists between the Jandakot and Perth Air Traffic Control Towers. These navigation and communication links

rely on the transmission of radio waves that must be protected from structures or obstacles that could cause signal refraction or interference.

The NASF Principles state that Guidelines for the Protection of Communication, Navigation and Surveillance Infrastructure will be considered at a later stage. While these additional guidelines have not yet been released for public comment, consideration is made of protecting this critical infrastructure. Information about relevant developments is provided to Airservices to allow an assessment to be made to ensure that the performance of current and future navigation and communication aids is maintained.

8.9 PUBLIC SAFETY ZONES

The NASF Principles state that Guidelines for Public Safety Zones will be considered at a later stage. As JAH expects the provision of Public Safety Zones to be implemented in the future, consideration of these requirements was undertaken and is detailed in Section 4.7.4.

8.10 IMPROVING AIRPORT SAFEGUARDING

The State Government recognises Jandakot Airport as a vital piece of infrastructure and the need to protect the airport from encroachment by incompatible land use and development, so as to provide for its ongoing, safe, and efficient operation. In this regard the Western Australian Planning Commission has published State Planning Policy 5.3 – Jandakot Airport Vicinity (SPP 5.3) (2006) which incorporates the ANEF from the Jandakot Airport Master Plan 2005, and has taken steps to include updated ANEFs as outlined in Section 2.3.7.

Given that the airport is situated within an urban growth zone, JAH believes that proactive consultation is required with developers, local councils and State Government authorities at the planning and development stages. Potential residents need to be made aware of airport operations and aircraft noise prior to purchasing property within a 5km radius of the airport in order to make an informed decision about the level of noise they are comfortable to accept. JAH will continue to respond to residential planning proposals in the vicinity of the airport to request additional measures such as notifications on land titles for development within the N60 100 daily noise event contours, adequate noise attenuation measures (e.g. window glazing), aircraft noise impact area signage and provision of aircraft

noise impact information to potential residents. JAH acknowledges the City of Cockburn's recommendation of these additional measures for the recently approved Banjup Quarry Redevelopment.

The NASF 'Guideline A: Measures for Managing Impacts of Aircraft Noise' acknowledges that the 20 ANEF and 25 ANEF zones do not capture all high noise affected areas around an airport and that Australian Standard AS2021 recognises that the ANEF contours are not necessarily an indicator of the full spread of noise impacts, particularly for residents newly exposed to aircraft noise. As such, JAH welcomed the announcement in May 2013 by Standards Australia that it would proceed with a review of AS2021, and that the approved scope includes reviewing the applicability of AS2021 to small airports. Pending the outcome of that review, JAH fully supports the inclusion of the frequency-based noise charts (N60, N65 & N70 Noise Contours) to supplement the ANEF as recommended in NASF Guideline A.

9. ENVIRONMENT STRATEGY

9.1 OVERVIEW

In managing and developing the airport, Jandakot Airport Holdings complies with the *Airports Act 1996* and *Airports (Environment Protection) Regulations 1997*. In accordance with the Act, Jandakot Airport is required to produce a final Master Plan which now includes the Environment Strategy.

The Jandakot Airport Environment Strategy 2014 (the Environment Strategy) outlines Jandakot Airport's environment management objectives for the five year period from 2014 to 2019.

This Environment Strategy describes how JAH will meet the environmental management requirements of the Act. It has been developed with consideration of current airport operations as well as proposed future development.

9.1.1 STAKEHOLDER CONSULTATION

In preparing the Environment Strategy, JAH has undertaken significant consultation with key stakeholders including Federal, State and Local Governments, aviation users and community groups. Details of the consultation undertaken are summarised in Chapter 10.

9.1.2 ENVIRONMENTAL ASPECTS

The environmental aspects addressed in the Environment Strategy have been identified through the previous Environment Strategy (2009) environmental reviews, audits and the development of the JAH Environmental Management System. These have been classified as follows:

- Environment Management;
- Soil and Water Quality;
- Air Quality;
- Biodiversity and Conservation;
- Cultural Heritage;
- Ground Based Noise;
- Water and Energy Resources; and
- Waste.

These aspects are detailed in the following Sections 9.2 through 9.9, respectively. Where relevant, each of these sections delineates:

- Objectives for management;
- The existing environment at the airport pertaining to each aspect;
- Potential impacts of airport operations on the natural environment at the airport;
- Recent achievements; and
- Targets for environmental management at the airport from 2014-2019.

9.2 ENVIRONMENT MANAGEMENT

Objective: Maintain environmental management, monitoring and reporting obligations as described in the JAH Environmental Management Framework.

The Environment Strategy outlines the JAH Environment Policy and JAH's commitments and targets for the next five years.

This section describes the JAH environmental management approach by way of description of the environmental regulatory framework and the Environmental Management Framework, and the associated responsibility for its implementation.

9.2.1 ENVIRONMENTAL REGULATORY FRAMEWORK

JAH and its tenants have a diverse range of environmental obligations as a result of legislation, licences, lease conditions, permits and development approvals. The key pieces of legislation controlling the environment operations of the airport are the *Airports Act 1996*, *Airports (Environment Protection) Regulations 1997* and the *Environment Protection and Biodiversity Conservation Act 1999*.

In addition, various industry codes of practice, Australian Standards and other guidelines are applicable to operators at the airport.

ENVIRONMENT PROTECTION AND BIODIVERSITY
CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the protection of the environment, especially matters of national environmental significance. Under the EPBC Act, a person must not take action that has, will have, or is likely to have a significant impact on any matters of national environmental significance without approval from the Australian Government Environment Minister.

EPBC referral 2009/4796 (Jandakot Airport Expansion, Commercial Development and Clearance of Native Vegetation, WA) was approved with conditions by the then Minister for Environment, Water, Heritage and Arts in March 2010. This approval allows for clearing of native vegetation within Precincts 1B, 3, 4 and 5 to enable the development of commercial development and the proposed airfield development as detailed in the Master Plan 2009. The conditions of approval include the development and implementation of various management plans, including an Offset Plan, Conservation Management Plan, Construction Environmental Management Plan and Groundwater Management Plan. All of these plans have been developed and implemented.

EPBC Referral 2013/7032 (Jandakot Airport Precinct 6 and 6A) was approved by the Department of the Environment in July 2014. This approval allows for the clearing of native vegetation within Precincts 6 and 6A for the subsequent mixed business and aviation developments. The conditions of approval include the acquisition of offset land, the development and implementation of a Construction Environmental Management Plan and measures to protect the Jandakot Groundwater Mound.

AIRPORTS ACT 1996 AND AIRPORTS (ENVIRONMENT
PROTECTION) REGULATIONS 1997

The *Airports Act 1996* and subsidiary legislation are the primary statutory controls for ongoing regulation of activities on airport land. In particular, Part 5 Division 3 Section 71(h) of the Act details the requirements of an Environment Strategy and Part 6 of the Act addresses matters resulting in environmental harm.

The *Airports (Environment Protection) Regulations 1997* detail general duty requirements of airport-lessee companies, and identify and define procedures and standards to be employed in determining the level and

impact of air, water and soil pollution and excessive ground based noise. These Regulations also set out in detail the environment standards, monitoring and reporting regimes and the enforcement provisions for environmental matters specified in the Act and Regulations.

All users of Jandakot Airport have a duty under the Regulations to:

- Prevent pollution;
- Preserve:
 - local biota, ecosystems and native species habitats;
 - existing aesthetic, cultural, historical, social and scientific (including archaeological and anthropological) values;
 - vulnerable or endangered flora and fauna species;
 - conservation significant vegetation;
 - sites of indigenous significance at the airport; and
- Prevent the generation of offensive noise.

OTHER COMMONWEALTH ENVIRONMENT AND HERITAGE
LEGISLATION

Commonwealth legislation, in addition to those detailed above, which applies to the airport includes:

- *Australian Heritage Council Act 2003*;
- *Native Title Act 1993*; and
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

WESTERN AUSTRALIAN ENVIRONMENT AND HERITAGE
LEGISLATION

Some State environmental legislation applies to Jandakot Airport under the provisions of the *Commonwealth Places (Application of Laws) Act 1970*. Regulation of environmental issues can therefore occur through State agencies in selected circumstances, typically in instances where Commonwealth legislation does not exist (i.e. waste management). Where State and Commonwealth legislation conflicts, Commonwealth legislation takes precedence.

State legislation which is applicable to the airport includes:

- *Dangerous Goods Safety Act 2004*;
- *Environmental Protection (Controlled Waste) Regulations 2004*;
- *Occupational Safety and Health Act 1984*; and
- *Aboriginal Heritage Act 1972*.

The following environment related State Planning policies are also relevant to the airport site.

STATE PLANNING POLICY 2.3 – JANDAKOT GROUNDWATER PROTECTION POLICY

The objectives of State Planning Policy 2.3 – Jandakot Groundwater Protection Policy (SPP 2.3) are to:

- Ensure that all changes to land use within the policy area are compatible with long-term protection and maintenance of groundwater for public supply and maintenance of associated ecosystems;
- Prevent land uses likely to result in contamination of groundwater through nutrient or contaminant export;
- Balance environmental protection with the economic viability of the existing land uses;
- Maintain or increase natural vegetation cover over the policy area; and
- Protect groundwater quality and quantity in the policy area in order to maintain the ecological integrity of important wetlands hydraulically connected to that groundwater, including wetlands outside the policy area.

The western and southern extent of Jandakot Airport, comprising portions of Precinct 5 and 6 and the eastern end of the site of the proposed fourth runway, are within the Jandakot Underground Water Pollution Control Area (JUWPCA) Priority 1 Source Protection Area as established by SPP 2.3. The alignment of the JUWPCA is shown in Figure 9.1. Details on the JUWPCA and the associated management of airport development and activities are provided within Section 9.3.

SPP 2.3 acknowledges that “air transport” exists in the policy area, and that *“this transport infrastructure is an integral part of the urban fabric of the Perth*

Metropolitan Area and in general is an acceptable use within the Policy Area.” The policy further notes that whilst there are potential risks to groundwater, it is expected that best practice management will occur when development of this nature is undertaken, to protect the groundwater in the area, as outlined in Section 9.3.

STATE PLANNING POLICY 2.8 – BUSHLAND POLICY FOR THE PERTH METROPOLITAN REGION

State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region (SPP 2.8) identifies measures that will apply to proposals or decisions that are likely to have an adverse impact on regionally significant bushland within a ‘bush forever’ area. Bush forever is not binding on Commonwealth land and does not prevent any use or development at Jandakot Airport.

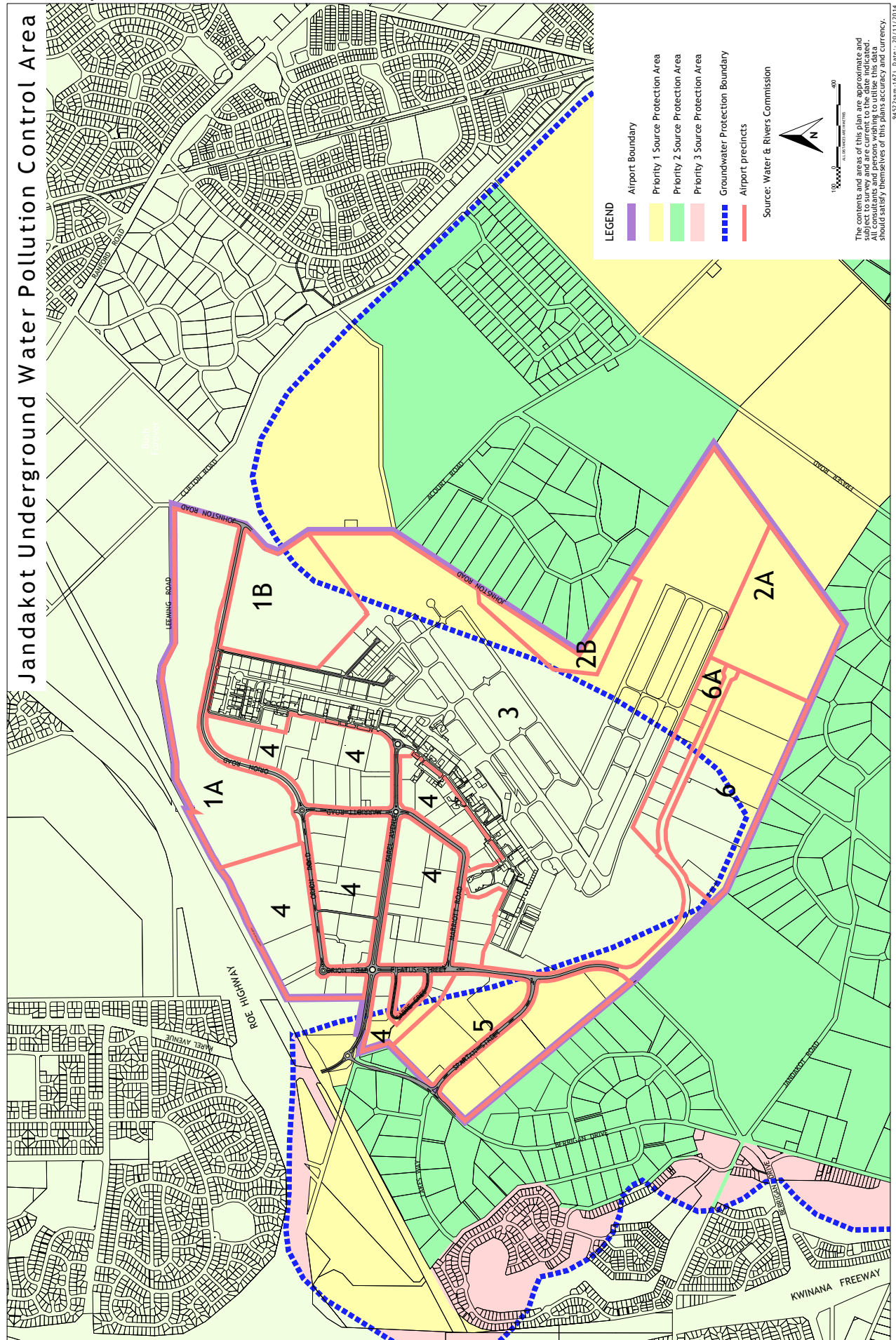
Whilst one of the objectives of the policy is to seek to protect regionally significant bushland, it recognises that the airport site can be developed in accordance with its purpose as an airport owned by the Commonwealth Government and subject to Commonwealth legislation.

9.2.2 ENVIRONMENTAL MANAGEMENT APPROACH

This section describes the Environmental Management Approach by way of description of the Environmental Management Framework and the associated responsibility for its implementation.

The JAH Environmental Management System (EMS) is based on AS/NZS ISO 14001 and was developed in 2004. Achievement of the Environment Strategy targets is facilitated by the JAH EMS and the development and implementation of various management plans. Within the EMS are implementation tools required to ensure the Environment Strategy commitments are met, including the Environmental Site Register and specific policies and procedures.

FIGURE 9.1 - JANDAKOT UNDERGROUND WATER POLLUTION CONTROL AREA

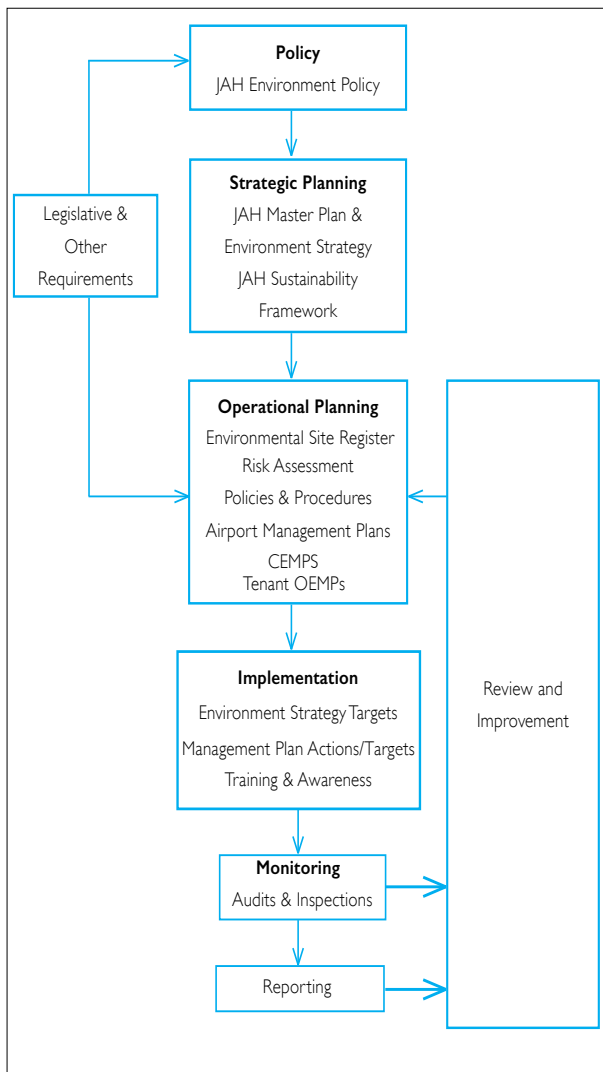


ENVIRONMENTAL MANAGEMENT FRAMEWORK

The JAH EMS is implemented through the documented Environmental Management Framework provided as Figure 9.2. This has been reviewed in conjunction with the development of the Environment Strategy 2014.

The key elements of the Environmental Management Framework are outlined below.

FIGURE 9.2 - JAH ENVIRONMENTAL FRAMEWORK



ENVIRONMENT POLICY

JAH's Environment Policy guides the management of the natural environment at Jandakot Airport. The Policy is as follows:

Jandakot Airport Holdings Pty Ltd manages and operates Jandakot Airport, Western Australia's premier General Aviation aerodrome. Jandakot Airport covers an area of 622ha, including bushland reserved for conservation.

JAH recognises and accepts its responsibility to maintain and protect the quality of the environment in and around its operations. In achieving this, JAH commits to establishing and maintaining a system that strives to:

- Develop and manage Jandakot Airport in a manner sensitive to the environment;
- Comply with environmental legislation and regulations;
- Work with relevant authorities and the community to identify specific objectives and targets to minimise adverse environmental impacts;
- Pursue opportunities to promote efficient use of resources and increase recycling;
- Measure, monitor, report and improve upon the environmental performance defined by our objectives and targets; and
- Promote JAH's commitment to the environment, employees, tenants, customers and neighbours.

Jandakot Airport employees, contractors and tenants all have a duty to fulfil environmental responsibilities.

ENVIRONMENTAL SITE REGISTER

JAH maintains as part of its EMS an Environmental Site Register as required by the *Airports (Environment Protection) Regulations 1997*. The Register is an electronic database containing information relating to the following:

- Known and suspected contaminated sites at the airport, including results of any contaminated site assessments and remediation undertaken;
- Environmental incidents and complaints summary;
- Results of environmental monitoring summary;
- Aerobic treatment unit maintenance records;
- Environmental audit and inspection programme summary;
- Tenant Risk and Operational Environmental Management Plan status register; and
- New discoveries of significant cultural objects, species or ecological communities.

ENVIRONMENTAL POLICIES, PROCEDURES AND GUIDELINES

JAH's environmental policies and procedures are updated regularly to reflect changes in legislation, development and information. These are specific management instructions or work instructions for particular issues. Wherever practical and possible, environmental procedures and guidelines are incorporated into overarching Jandakot Airport documents such as the Jandakot Airport Leasing and Development Guidelines.

AIRPORT MANAGEMENT PLANS

A number of environmental factors at the airport are managed through specific management plans, programs and strategies. These include the following:

- Conservation Management Plan, which includes:
 - Weed Management Plan;
 - Dieback Management Plan;
 - Bushland Rehabilitation and Revegetation guidelines;
 - Jandakot Rare Orchid Research Program;
 - Feral Animal Management Plan;
 - Bush Fire Management Plan;
 - Wildlife Fencing and Underpass Strategy; and
 - Heritage Management Plan;
- Local Water Management Strategy;
- Water Efficiency Management Plan;
- Groundwater Management Plan;
- Jandakot Airport Offset Plan; and
- Construction Environmental Management Plan for Clearing and Civil Works associated with EPBC 2009/4796.

Many of these plans, such as the Conservation Management Plan, are linked to EPBC approval conditions and require the approval of the Minister for the Environment.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLANS

All construction/civil works (including demolition) with the potential for environmental impacts require a Construction Environmental Management Plan (CEMP), which must be reviewed and endorsed by

the JAH Environmental Management team prior to works commencing. The requirement for CEMPs is typically included as a condition of the building/works/demolition permit.

Clearing and construction activities associated with EPBC approved projects are undertaken in accordance with relevant CEMPs (as required by the conditions of approval) which must be approved by the Minister for the Environment.

TENANT OPERATIONAL ENVIRONMENTAL MANAGEMENT PLANS

Jandakot Airport tenants are responsible for managing their own operations in an environmentally responsible manner. JAH has developed guidelines and templates to assist tenants in the development of Operational Environmental Management Plans (OEMPs).

The requirement for a tenant OEMP is directly linked to a tenant's environmental risk profile.

In accordance with the Jandakot Airport Tenant Environmental Risk Allocation and Auditing Frequency Criteria, tenants assessed as having a 'Low' environmental risk profile can be provided with an OEMP exemption following a documented site inspection by JAH environmental staff.

AIRPORT ENVIRONMENTAL ACTION PLAN

The Airport Environmental Action Plan (AEAP) is a schedule of all of the environmental actions to be undertaken at the airport by JAH. This is essentially a management tool to assist JAH environmental staff and ensure that actions are identified in a manner that allows for sufficient planning and implementation within the stipulated timeframes. Whilst concentrating on the following 12-month period, the AEAP also includes actions and tasks that are planned within the five year term of the Environment Strategy. Actions are derived from:

- Environment Strategy targets;
- Airport Environmental Management Plans (CMP, CEMP etc.);
- Incident reports and investigations;
- Remediation reports;
- Monitoring reports;

- Audits; and
- Annual reviews.

TRAINING AND AWARENESS

Training and awareness are integral to the effectiveness of the Environmental Management Framework, with employees, contractors and tenants requiring a sound understanding of the issues surrounding environmental management of the airport, along with regulatory requirements, internal standards, policies and objectives.

Training is provided to all JAH employees at induction, relevant to their role. Individual staff training needs are reviewed through JAH's annual performance review process and in monthly staff meetings.

Contractors employed by JAH are required to undertake a site safety induction that includes a component on environmental responsibilities.

JAH has developed the Tenant Environmental Handbook to assist tenants in understanding their environmental obligations at Jandakot Airport and to provide information of a general nature to assist in meeting those obligations. The Tenant Environmental Handbook is published electronically on the JAH website along with other relevant tenant environmental resources, and updated as required. Periodically tenant notices relating to current environmental issues are distributed to tenants via email and published on the JAH website.

Training and awareness is a component of all Tenant OEMPs, thus ensuring that tenants provide appropriate environmental training and awareness to their staff. Similarly, training and awareness is a component of all CEMPs.

MONITORING

JAH undertakes several environmental monitoring programmes that are carried out by qualified professionals when required (as summarised in Table 9.1). Monitoring requirements are typically detailed within relevant management plans (CMP, CEMP and Groundwater Management Plan) which are approved by the Department of the Environment and linked to EPBC conditions of approval.

Regular monitoring ensures that changes in environmental conditions or events of non-compliance are noted, allowing for corrective measures to be

implemented. Monitoring provides ongoing data which can be used to assess the airport against legislative compliance and improve management of environmentally significant attributes.

Table 9.1 Summary of Environmental Monitoring Undertaken at Jandakot Airport

Monitoring Type	Frequency
Groundwater quality	As defined in Groundwater Management Plan
Groundwater abstraction	Monthly
Scheme water usage	Every two months
Airside fauna monitoring	Daily
Soil testing	As required
Archaeological	As required during clearing and earthworks
Energy usage	Monthly
Flora	Seasonally as defined in CMP
Fauna	As defined in CMP
Introduced plant species	Annually
Dieback	Triennially

TENANT AUDITS

Tenants are audited to determine the tenant's compliance with the JAH Environment Strategy and OEMP.

In addition to audits, JAH completes tenant inspections that may be undertaken to:

- Investigate a particular environmental management issue in between scheduled audits; and
- Confirm the low risk status of a site prior to issuing an OEMP exemption.

ENVIRONMENTAL SITE ASSESSMENTS

Prior to the expiry or termination of a sub-lease, JAH reviews the activities that have occurred on site during the term of the lease and determines whether the likelihood of soil or groundwater contamination exists. If past or current activities on the site have the potential to result in soil or groundwater contamination, then an Environmental Site Assessment of the leased site is undertaken by JAH.

If the Environmental Site Assessment concludes that the site is likely to be contaminated, further investigations are undertaken in order to define the presence, nature, magnitude and extent of contamination and recommend if appropriate remediation and/or monitoring is required.

REPORTING

JAH will produce an Annual Environment Report (AER) both for internal review purposes and submission to the Department of Infrastructure and Regional Development and the Department of the Environment.

These reports include updated information on:

- targets within this Environment Strategy;
- commitments and actions as detailed within Management Plans associated with EPBC conditions of approval;
- any additional contaminated sites;
- remediation measures undertaken at known contaminated sites;
- results of any investigations or monitoring undertaken; and
- details of any environmental complaints or incidents.

INCIDENT REPORTING

JAH staff, tenants and contractors are required to report all environmental incidents to JAH for investigation. Incidents include spills that have the potential to result in environmental harm, complaints, aircraft wildlife hazards and other non-compliances.

All incidents are recorded within the JAH Safety Management System and are subject to an initial investigation, and corrective actions are identified if warranted. For incidents resulting in potential contamination, corrective actions may include groundwater and/or soil sampling or the development and implementation of a remediation programme.

REVIEW

The EMS is subject to an annual review following the compilation of the Annual Report. The EMS review outcomes are used to update the Airport Environmental Action Plan.

Every five years, the complete Environmental Management Approach is reviewed in conjunction with the development of the new Environment Strategy. The last review was undertaken in 2013 and the next review will be undertaken in 2018 as part of the development of the Environment Strategy 2019.

Elements of the JAH Environmental Management Framework (e.g. policies, procedures, management plans etc.) are periodically reviewed and amended. These reviews may occur as part of scheduled review actions, or in response to new and updated information that may arise from audits, monitoring or other means.

IMPLEMENTATION

The implementation of the management framework described above allows for improvement of all elements of the JAH EMS.

In implementing the Jandakot Airport Environment Strategy 2009, JAH has demonstrated improvement in both its day to day operations and new developments at the airport.

9.2.3 MANAGEMENT STRUCTURE AND RESPONSIBILITY

As the leaseholder of Jandakot Airport, JAH has the ultimate responsibility for environmental management at the airport.

Roles, responsibilities and authorities of JAH personnel are defined in the EMS to ensure effective implementation of control systems and procedures. All JAH staff, tenants and general users of the airport have a responsibility to protect the environment of the airport through the *Airport (Environmental Protection) Regulations 1997*, lease conditions and other applicable legislation.

To ensure the successful implementation and operation of the Environment Strategy, responsibility has been assigned to the parties listed in Table 9.2.

Table 9.2 Implementation of the Environmental Management Strategy

Party	Responsibility
Board of Directors (including Managing Director)	The environmental performance of JAH Periodic review of the JAH Environment Policy Allocation of resources to manage environmental issues Ensuring JAH staff fulfil their environmental responsibilities
JAH Management Committee	Providing guidance on implementation of the JAH EMS Assistance in implementation of the Environment Strategy
JAH Safety Management System Committee	Providing guidance on implementation of the JAH EMS Review of significant incidents Review of company-wide environmental risks and performance Assistance in implementation of the Environment Strategy
JAH Environment Manager (supported by the Environment Coordinator)	Preparing the Environment Strategy and monitoring its implementation Review of the JAH EMS Preparing and monitoring implementation of the airport's Management Plans and Programmes Ensuring compliance with regulatory requirements Preparation of the Annual Environment Report Providing environmental advice and training to staff and contractors Assisting staff, tenants and contractors with environmental compliance Environmental incident response and investigation
JAH Managers (including Airport Operations Manager; Facilities Manager; Building Approvals Manager)	Management of daily environmental issues associated with their department's operations Ensuring that operations comply with applicable legislation Identification of staff training needs Integration of environmental requirements into daily operations Staff environmental awareness
JAH Staff	Reporting environmental incidents, and complaints Adhering to relevant EMS Procedures and management plans Undertaking work in compliance with applicable environmental legislation Participation in environmental training and awareness
JAH Contractors	Reporting environmental incidents, and complaints Adhering to relevant EMS Procedures and management plans Undertaking work in compliance with applicable environmental legislation Participation in site inductions and relevant environmental training and awareness programs Development and implementation of CEMPs as required

TENANTS

The airport hosts a wide variety of tenants. Tenant activities include aircraft operations, aircraft maintenance, flight training, accommodation, retail, warehousing and industrial.

Airport tenants are responsible for managing their own operations in an environmentally responsible manner in accordance with the Environment Strategy 2014. The Environment Strategy 2014 will be made available on the JAH website.

JAH requires that tenants comply with their airport environmental management responsibilities via a number of procedures and processes, including:

- Conditions detailed within leases and licenses;
- Tenant CEMPs and OEMPs;
- Conditions of approval for developments, building and works applications,
- Environmental site assessments for lease terminations;
- Tenant site inspections and audits; and
- Incident reporting.

9.2.4 REGULATORY AGENCIES

Environmental regulation of the airport is carried out by the Department of Infrastructure and Regional Development and the Department of the Environment.

DEPARTMENT OF INFRASTRUCTURE AND REGIONAL DEVELOPMENT

The Airport Environment Officer (AEO) is employed by the Department of Infrastructure and Regional Development and is authorised under the Act to exercise powers regarding environmental issues conveyed through the legislation. The AEO monitors JAH's compliance with this Master Plan and Environment Strategy, and the *Airports (Environment Protection) Regulations 1997*. JAH activities are monitored and compliance communicated through regular meetings, site inspections, monitoring and reporting. In addition to this, the AEO provides advice to the Airport Building Controller in the assessment of all building applications.

DEPARTMENT OF THE ENVIRONMENT

The Department of the Environment administers the EPBC Act, under which approvals are obtained for clearing and development when matters of national environmental significance are impacted. JAH liaises with and reports to the Approval Monitoring (South) Section regarding EPBC approved projects.

9.2.5 ENVIRONMENTALLY SIGNIFICANT AREAS

Through previous environmental investigations and consultation with relevant State and Commonwealth Departments, JAH has identified the following areas of environmental significance.

CONSERVATION PRECINCTS

Conservation Precincts as designated in this Master Plan are considered environmentally significant primarily due to the presence of banksia woodland, which provides foraging habitat for Carnaby's Cockatoos (*Calyptorhynchus latirostris*). In addition, the presence of the Grand Spider Orchid (*Caladenia huegeli*) in Precinct IA and to a lesser extent Precinct IB, adds to the significance of these specific areas.

9.2.6 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- Review and amendment of the JAH Environment Policy, Environmental Management Framework and various supporting policies, procedures guidelines and management plans;
- Development of an OEMP template and progressive development and implementation of OEMPs by airport tenants consistent with the Tenant Environmental Risk Allocation and Auditing Frequency Criteria;
- Development of a CEMP template and development and implementation of CEMPs for clearing and new developments;
- Promulgation of environmental tenant resources on the JAH webpage, including an updated Tenant Environmental Handbook; and
- Development and application of the Tenant Auditing and Risk Classification Tool, including implementation of an updated tenant audit schedule.

9.2.7 TARGETS

The Environmental Management Approach is the general framework through which JAH manages the environment at the airport. The targets established in this section are not specific to one environmental factor, but instead highlight the Environmental Management Approach that will facilitate the achievement of targets in Sections 9.2 - 9.9.

Table 9.3 Environment Management Targets

Target	Timeframe
Review and if required amend environmental policies, procedures and guidelines	Ongoing
Review Tenant Environmental Handbook	2015
Promulgate staff and tenant environmental resources (policies, guidelines, tenant Environmental Handbook etc.) on the JAH website.	Ongoing
Require all tenants/ projects that have the potential to cause environmental harm develop and implement an OEMP/CEMP	Ongoing
Undertake auditing of tenants considered to have a medium to high risk operation (according to the Tenant Environmental Risk Allocation and Auditing Frequency Criteria)	Ongoing
Undertake environmental reporting to regulatory authorities.	Annually
Maintain Environmental Action Plan.	Annually
Review and update the JAH Environmental Management Framework.	2019

9.3 SOIL AND WATER QUALITY

Objective: To minimise potential contamination of soil and water sources

Groundwater and soil impacts are intimately linked, and as such, the impacts of airport operations on groundwater and soil have been considered together. The southern part of the site is located within the northern boundaries of the Jandakot Groundwater Mound.

9.3.1 OVERVIEW

GEOLOGY AND SOILS

The Armadale and Fremantle 1:50 000 Environmental Geology Series indicates Jandakot Airport consists of Quaternary superficial alluvial sediments, varying in thickness from around 30 m to 60 m. The sands unconformably overlay the older Osborne and Leederville formations, comprising of shale and siltstones.

The Swan Coastal Plain consists of a series of distinct dune systems aligned approximately north to south and extending from the coast to the Darling Scarp. The Quindalup and Spearwood dune systems lie closest to the coast, with the Bassendean dune system further to the east. Jandakot Airport lies approximately 3 km east of the Spearwood system boundary, within the Bassendean dune system. Bassendean sands are Aeolian, or windborne, soils derived from particles washed up by the ocean and blown by wind to form dunes. These sands are characterised as pale grey, white, medium grained, moderately sorted quartz sand with black heavy minerals scattered throughout (McArthur and Bettenay 1960).

The topography of the airport and surrounding areas is generally flat, with local variations in height of 20 m or less. Most of the site has an elevation of approximately 28-30 m AHD. High points of 40-45 m AHD occur in the south-eastern corner and within Precinct 1A.

ACID SULFATE SOILS

Acid sulfate soil (ASS) is the common name for soils that contain metal sulfides. In an undisturbed and waterlogged state, these soils may pose no or low risk. However, when acid sulfate soils are disturbed or exposed and react with oxygen, they produce sulfuric acid which may be accompanied by certain hazards. Metals may be released from sediments and become bioavailable in the environment, oxygen may be removed from the water column and gases such as hydrogen sulfide, sulfur dioxide and methane may be released.

Failure to appropriately manage acid sulfate soils may:

- Impact the quality of potable drinking water groundwater due to acidification and release of metals in acid sulfate soil areas and receiving waters;
- Impact the quality of groundwater extracted for non-potable purposes (i.e. irrigation); and
- Impact infrastructure and the built environment by subsidence and corrosion.

According to DEC Acid Sulfate Soil Risk Maps (Landgate, 2013) the majority of the site is located in an area of moderate to low risk of ASS occurring within 3m of the natural soil surface but high to moderate risk of ASS beyond 3 m of the natural soil surface (i.e. Class 2). A small area of land in the south of the airport is

categorised as 'high to moderate risk of ASS occurring within 3m of the natural soil surface' (i.e. Class 1).

The WA Department of Environment Regulation (DER) has released an Acid Sulfate Soils Guideline Series containing the following:

- Identification and investigation of acid sulfate soils and acidic landscapes (DEC 2013); and
- Treatment and management of soils and water in acid sulfate soil landscapes (DEC 2011).

In line with the DER guidelines, sites will be investigated for acid sulfate soils if any of the following are proposed:

- Soil or sediment disturbance of 100m³ or in areas depicted in an ASS risk map as Class 1;
- Soil or sediment disturbance of 100m³ or more with excavation from below the natural water table in an area depicted on an ASS risk map as Class 2; and
- Lowering of the water table, whether temporary or permanent, in areas depicted in an ASS risk map as Class 1 or Class 2.

If the initial investigation confirms the presence of ASS, an ASS Management Plan will be developed and implemented.

STORMWATER

Development increases the area of impermeable surfaces such as buildings, roads, car parks, runways and apron areas, which concentrate run-off following very intense rainfall events.

Stormwater from roofs is collected and discharged into soakwells in order to facilitate and maximise groundwater recharge.

Drainage swales and basins have been created in strategic areas of the airport to collect run-off from roads and other sealed surfaces. Due to the high permeability of the Bassendean soils, run-off is localised and short term as it generally infiltrates very quickly.

Groundwater downgradient to drainage basins within or directly adjacent to the Jandakot Underground Water Pollution Control Area is monitored in order to ensure that water quality is not adversely impacted by stormwater management practices at the airport.

WETLANDS

Within Jandakot Airport there are no natural drainage channels or defined areas of surface water.

The two wetlands that occur on the site are both Resource Enhancement category wetlands (Damplands) as defined by the DEC Geomorphic Wetlands of the Swan Coastal Plain dataset (DEC 2008). These are located in Precincts 1A and 2A, both of which are designated conservation areas. Both damplands are within areas infested with dieback, *Phytophthora cinnamomi*.

Resource Enhancement Wetlands are wetlands which may have been partially modified but still support substantial ecological attributes and functions. Normally, a 50m buffer is required between Resource Enhancement Wetlands and development. It is possible that the East Link Road, which will divide Precincts 1A and 1B, will impact the southern boundary of the dampland in Precinct 1A. However, this is an improvement from that proposed in Master Plan 2009, where the East Link Road alignment was to bisect the dampland. Regardless, potential impacts will be minimised and managed via the implementation of a Construction Environmental Management Plan.

With the exception of the small portion that will be impacted by the East Link Road, Jandakot Airport will continue to retain and manage these wetlands in Conservation Precincts at the airport. Retention of the wetlands' conservation values is achieved by the management actions associated with the Jandakot Airport Conservation Management Plan.

GROUNDWATER

The Jandakot Airport is partially located on the northern margin of the Jandakot Groundwater Mound, with the crest of the mound located just south of the airport (Davidson, 1995).

The shallow sand aquifer covers an approximate area of 760 km², from the Swan River in the north to the Serpentine River in the south. The Jandakot Mound has primarily developed because the rate of infiltration exceeds the rate of horizontal groundwater flow through the aquifer.

Groundwater levels at Jandakot Airport are generally shallow (22 to 26 mAHD) with little variability in the groundwater levels throughout the year. Groundwater levels generally rise between June and September

in response to infiltration from rainfall followed by a recession from September to June, with the seasonal difference typically being less than 2 m. A review of historical Department of Water data shows that groundwater levels in the Jandakot area have receded over the last 35 to 40 years. This is supported by Department of Water findings of ground water levels across the Perth region as a whole (DoW, 2009).

Groundwater flow direction is south-east to north-west, away from the Jandakot Underground Water Pollution Control Area (JUWPCA) (JDA 2006).

GROUNDWATER ABSTRACTION

JAH abstracts groundwater for irrigation and construction (primarily dust suppression) purposes via a network of bores. Groundwater abstraction occurs in accordance with a licence issued by the Department of Water. All groundwater abstraction bores are metered and water consumption rates are monitored monthly. The Jandakot Airport Groundwater Management Plan will be amended in 2015 to include the management and reporting of groundwater abstraction.

UNDERGROUND WATER POLLUTION CONTROL AREA

The Jandakot Mound is gazetted as both a Public Drinking Water Supply Area (PDWSA) and an Underground Water Pollution Control Area (UWPCA). The UWPCA defines the area of the Jandakot Mound groundwater system that provides public water supply as part of the Integrated Water Supply Scheme. The Department of Water manages Western Australia's water resources including the Jandakot Mound and restricts land uses that may pose a threat to the quantity or quality of water available from the mound for public water supply.

Within the Jandakot UWPCA, a three-level priority system is used. The priority classifications are determined by land tenure, land use and water flow patterns. Each priority classification is subject to the following management objectives:

- Priority 1 (P1) classification areas are managed to ensure that there is no degradation of the drinking water source by preventing the development of potentially harmful activities in these areas. The guiding principle is risk avoidance. This is the most stringent priority classification for drinking water sources. P1 areas normally encompass land owned or managed by State agencies, but may include

private land that is strategically significant to the protection of the drinking water source (e.g. land immediately adjacent to a reservoir);

- Priority 2 (P2) classification areas are managed to ensure that there is no increased risk of water source contamination/pollution. For P2 areas, the guiding principle is risk minimisation. These areas include established low-risk land development (e.g. low intensity rural activity); and
- Priority 3 (P3) classification areas are defined to manage the risk of pollution to the water source from catchment activities. Protection of P3 areas is mainly achieved through guided or regulated environmental (risk) management for land use activities. P3 areas are declared over land where water supply sources coexist with other land uses such as residential, commercial and light industrial development (DoE, 2004).

In addition to the three Priority Classification Areas, specific protection zones are defined to protect drinking water sources from contamination in the immediate vicinity of water extraction facilities. Within these zones by-laws may prohibit, restrict or approve defined land uses and activities to prevent water source contamination or pollution. Wellhead protection zones are used to protect underground sources of drinking water. They are circular with a radius of 300 – 500 m.

Portions of the airport land are within the P1 Source Protection Area of the Jandakot UWPCA, including:

- Conservation Precincts 2A, 2B and a portion of 1B;
- Portions of Precinct 4 and 5, which are already under development;
- Precinct 3, including existing infrastructure and portions of the proposed fourth runway and runway extension; and
- Portions of Precincts 6 and 6A.

There are no wellhead protection zones within or near Precinct 5 and 6; the closest is at the Glen Iris golf course approximately 800 m to the west of the airport boundary.

Existing developments at the airport that are located within the Jandakot Mound's Source Protection Area are managed in accordance with the Jandakot Airport Groundwater Management Plan. The Groundwater Management Plan will similarly be applied to Precincts 6 and 6A.

A groundwater pollution risk assessment and management strategy was presented to the Department of Water as part of the Master Plan 2009 and Environment Strategy and is applicable to the Master Plan 2014 and Environment Strategy.

Groundwater modelling was undertaken by consultants CyMod Systems (2009) to determine the risk posed by a potential spill in Precincts 6 and 6A to the Jandakot UWPCA. The CyMod modelling indicated that any spills within these precincts would take in the order of 18 to 20 years before the water quality at the nearest Water Corporation production bore would be affected. This would allow time for remediation measures to be undertaken to address any contamination in the unlikely event of a spill, before it affects the water quality at a production bore.

LOCAL WATER MANAGEMENT STRATEGY

JAH have developed a Local Water Management Strategy in consultation with the Department of Water. This considers storm water, water reticulation, irrigation, and effluent disposal. This strategy incorporates and provides for the implementation of Water Sensitive Urban Design at the airport.

The Local Water Management Strategy enables JAH to:

- Monitor compliance with state and regional planning policies;
- Propose catchment management objectives and preliminary design objectives for all elements of the water cycle;
- Map surface and groundwater catchments, including waterways and wetlands;
- Identify critical water resource management issues, including water quality;
- Detail known historical land use and potential for contamination and acid sulfate soils;
- Review the impacts of potential future developments within the Jandakot UWPCA;
- Identify measures to minimise these impacts on the Jandakot UWPCA;
- Identify synergies between the management of stormwater, groundwater and wastewater;
- Propose a strategy to ensure that surface and ground water quality and quantity information is available at an appropriate time to inform future land use planning decisions;

- Recommend pre and post development monitoring frameworks; and
- Include the results of liaison with the Department of Water and relevant local governments on water management strategies.

POLLUTION PREVENTION AND CONTAMINATION MANAGEMENT

Hazardous substances and dangerous goods are stored and used across the airport on a daily basis. These products have the potential to cause significant environmental impacts to both soil and groundwater if they are not stored and managed correctly.

Through consultation with regulators, tenants and other stakeholders, JAH has developed a number of measures to minimise the risk of pollution occurring and ensure that the risk posed by existing contaminated sites are appropriately managed. These include:

- Implementation of the Local Water Management Strategy and Groundwater Management Plan;
- No bulk storage of potentially polluting chemicals within the Jandakot UWPCA;
- All new developments are to be connected to deep sewer;
- All existing infrastructure to be connected to deep sewer by end of 2024 (excluding facilities where connection to deep sewer is not feasibly possible);
- Development of Construction Environmental Management Plans, Demolition Plans and Operational Environmental Management Plans to reduce the risk of pollution on tenant sites;
- Undertaking tenant audits and inspections;
- Training and awareness programs (e.g. site inductions, Tenant Environmental Handbook, spill response training, etc.); and
- Mandatory reporting of all spills greater than 2L and all spills that have the potential to result in environmental harm (regardless of volume).

All areas of confirmed or suspected contamination are reported and recorded on the JAH Contaminated Sites Register, which is a component of the Environmental Site Register. Sites are ranked according to the nature of contamination and risks posed. Where investigation identifies sites as requiring remediation or ongoing

monitoring, appropriate plans are developed and implemented in line with the *Airports (Environmental Protection) Regulations 1997*, *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM) and the Department of Environment Regulation's Contaminated Sites Management Series Guidelines as appropriate. The number of contaminated sites on the Environmental Site Register has been reduced from 14 in 2009 to eight in 2014. Three sites are subjected to ongoing monitoring programmes, and a further two sites are in the final stages of remediation and validation. The remaining sites are low risk unconfirmed contamination that will be addressed in future assessments.

Prior to the expiry, transfer or termination of a tenant lease or licence, an environmental site assessment is undertaken if the activities of the tenant are determined to have resulted in possible soil or groundwater contamination.

GROUNDWATER MANAGEMENT

Regular groundwater monitoring is undertaken at eleven monitoring bores across the airport site under the Jandakot Airport Groundwater Management Plan monitoring programme. The groundwater monitoring programme and groundwater monitoring bore locations takes into account the development areas within the UWPCA, including Precinct 5 and the proposed future development of Precincts 6 and 6A.

Additional groundwater and soil monitoring occurs as a component of sampling analysis plans and other ongoing monitoring programmes associated with known and suspected contaminated sites.

9.3.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2014, a range of commitments were achieved including:

- Acid Sulfate Soils managed and investigated in line with Department of Environment Regulation guidelines;
- All new developments within Precincts 4 and 5 are connected to sewer;
- Progressive expansion of the sewer connection to older established airport buildings within Precinct 3

- A reduction in the number of contaminated sites (potential and confirmed) on the Environmental Site Register; and
- Regular monitoring of groundwater.

9.3.3 TARGETS

Table 9.4 below lists proposed targets aimed at appropriate consideration and management of soil and water quality at Jandakot Airport

Table 9.4 Soil and Water Quality Management Targets

Target	Timeframe
Acid sulfate soils to be investigated and managed in line with DER Guidelines.	Ongoing
Implement the Jandakot Airport Local Water Management Strategy	Ongoing
Implement the Jandakot Airport Groundwater Management Plan.	Ongoing
Amend Jandakot Airport Groundwater Management Plan to include the management of groundwater abstraction bores.	2015
Continue to investigate and where appropriate monitor/remediate existing and new suspected and confirmed contaminated sites.	Ongoing
All new developments in Precinct 4, 5, 6 and 6A to be constructed with connection to sewer.	Ongoing
Effluent (sewage and greywater) to be disposed to sewer*.	2024
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), new facilities will install an approved ATU (applies to Precinct 3 outside of UWPCA only).	Ongoing
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), existing facilities with septic systems will be assessed and, if warranted, instructed to upgrade to an approved ATU.	2024
Continue to require all tenants/projects that have the potential to cause environmental harm develop and implement an OEMP/CEMP.	Ongoing
*With the possible exception of a few small, isolated tenants within Precinct 3 outside of the UWPCA where reticulated sewer connection is not feasibly possible.	

9.4 AIR QUALITY

Objective: To manage air emissions from airport operations and comply with relevant air quality legislation

9.4.1 OVERVIEW

Jandakot Airport, being a general aviation airport, does not experience the same degree of impact on air quality as major Australian airports with larger aircraft. The main sources of air emissions at Jandakot Airport are emissions from ground based operations including ground based aircraft movement, refuelling, solvent emissions from painting, mechanical and maintenance workshop emissions, and dust.

The potential impacts from ground-based emissions at Jandakot Airport include:

- degraded local and regional air quality;
- impacts on human health (through population exposure to airport pollution); and
- impacts on pollution-sensitive environment values.

The main impact on air quality during construction of new buildings at the airport is likely to be dust arising from exposed soil.

Emissions from aircraft whilst in the air are controlled by the *Air Navigation (Aircraft Engine Emissions) Regulations* which are the responsibility of Airservices Australia.

CLIMATE

The Bureau of Meteorology (BoM) has a weather station at Jandakot Airport, with more than 22 years of data recorded.

The Swan Coastal Plain Subregion has a Mediterranean climate. The area experiences a wide range of temperatures throughout the year, with an average maximum temperature of 24.5°C. In summer, maximum temperatures may reach 40°C, whilst in winter, minimum temperatures may reach <5°C (BoM 2013).

Rainfall tends to fall in winter, with a maximum monthly mean rainfall of 174.3 mm in July. The annual average rainfall at Jandakot Airport for 2013 was 829.5 mm (BoM 2013).

OZONE DEPLETING SUBSTANCES

Ozone Depleting Substances can be present in refrigerators, air conditioning systems and fire extinguishers. The identification of ODS (except internal aircraft use) is a component of the JAH tenant audit procedure and the JAH OEMP template prompts tenants to determine whether ODS are present on site when developing their OEMP. With the exception of use within aircraft, JAH are not aware of any ODS in use at the airport. Any ODS identified on the airport will be recorded within a register and JAH will liaise with the relevant tenant(s) to require that they are phased out where feasible.

DUST

Clearing and development activities are the primary source of dust on the airport. Activities are managed with the approved CEMPs which contain dust management strategies, including:

- suppression using non potable water and dust suppressants (e.g. dustex) where warranted.
- hydromulching;
- establishing temporary vegetative cover (e.g. rye grass) to stabilise between initial clearing and lot level development;
- using dust barriers to limit transport of dust off work areas, oriented to intercept prevailing winds;
- restriction of high risk activities in unsuitable wind/weather conditions; and
- restriction of construction traffic to designated areas and tracks.

Since the implementation of the Environment Strategy 2009, JAH has received a small number of dust complaints from both tenants and neighbouring residents. Of these complaints, approximately two thirds relate to clearing and development activities and one third relate to operational activities. Dust complaints are managed as environmental incidents and investigated to ensure corrective action is taken as soon as practicably possible.

PUBLIC TRANSPORT

JAH encourages its staff and tenants to reduce vehicle use in order to reduce emissions. In 2011 JAH commenced the operation of a shuttle bus service between Murdoch Train/Bus station and the airport. Following JAH's consultation with the State Government's Public Transport Authority, Transperth began operating a public bus service to the airport in 2013, replacing the JAH shuttle bus service.

AIRSHED MONITORING

Jandakot Airport is located within the regional South Lake airshed that comprises heavy industry, commercial activities, major arterial roads (including Kwinana Freeway and Roe Highway) and residential areas. The South Lake airshed is subject to the potential impacts of air pollutants, including carbon monoxide, particulate matter and photochemical smog (ozone), originating from activities within the Perth metropolitan area.

JAH utilises the ambient air quality monitoring data collected by the Department of Environment Regulation at the South Lake (South East Metropolitan) monitoring station, which is approximately three kilometres west of the airport. Given the potential impacts of road vehicle traffic and industrial facilities on the airshed it is likely to be difficult to draw any conclusions concerning the operation of the airport on local air pollution. However, analysis of the Department of Environment Regulation data since 2009 reveals no exceedances of the *Airports (Environmental Protection) Regulations 1997* requirements.

9.4.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- the inclusion of management and mitigation measure for dust control within CEMPs;
- the operation of bus services to Murdoch Train/Bus Station; and
- adoption of the South Lake (South East Metropolitan) data for local air quality monitoring, with no exceedances of the Regulations observed.

9.4.3 TARGETS

Table 9.5 below lists proposed targets aimed at monitoring and management of air quality.

Table 9.5 Air Quality Management Targets

Target	Timeframe
Continue to require all tenants/projects that have the potential to cause environmental harm to develop and implement an OEMP/CEMP.	Ongoing
Ensure all CEMPs include appropriate management actions to minimise the impacts of dust, including procedures to address dust complaints in a timely manner.	Ongoing
Compliance with legislative requirements, including reporting requirements when reporting thresholds are triggered.	As required
Utilise the South Lake (South East Metropolitan) monitoring station to determine ambient air quality.	Annually

9.5 BIODIVERSITY AND CONSERVATION

Objective: To conserve and manage flora and fauna within Jandakot Airport

Jandakot Airport is subject to a range of existing and potential environmental impacts that may threaten biodiversity and conservation values. These include:

- dieback (*Phytophthora cinnamomi*);
- weeds;
- feral animals and overabundant native species;
- bushfires;
- changes to surrounding land use; and
- insufficient information to manage biodiversity

The Conservation Management Plan, and all of its sub plans as outlined in Section 9.2.2, address these impacts. Published on the Jandakot Airport Website, the Conservation Management Plan includes all relevant ecological mapping, including maps illustrating vegetation communities, bushland condition, and significant species' habitats.

9.5.1 OVERVIEW

FLORA AND VEGETATION

Jandakot Airport is located in the South-West Botanical Province of Western Australia, in the Darling Botanical District and the Bassendean System of the Drummond Botanical Subdistrict (Beard, 1981).

The Bassendean Vegetation System corresponds to the older leached sands of the Bassendean Dune System. This system extends discontinuously for the length of the Swan Coastal Plain, with the overall cover being *Banksia* woodland. In general, this low woodland is dominated by *Banksia attenuata*, *Banksia menziesii*, *Banksia ilicifolia*, *Eucalyptus tottiana* and *Nuytsia floribunda*, with a dense understorey of sclerophyll shrubs. These characteristics are typified at Jandakot Airport (Mattiske 2013).

VEGETATION COMMUNITIES

Mattiske Consulting (2001a & 2013) mapped the vegetation communities at Jandakot Airport, determining that the vegetation on site consists of four Floristic Community Types described on the Swan Coastal Plain by Gibson et al. (1994). These are listed below:

- H2 - Open woodland of *Banksia attenuata* and *Banksia menziesii* (similar to FCT22 and FCT21c – Gibson et al. 1994) within Precincts 1A, 1B, 2A, 6 and 6A;
- J1 - Woodland of *Banksia ilicifolia* with *Banksia* spp. (similar to FCT22 and FCT21c – Gibson et al. 1994) - within Precincts 1A, 1B, 2A, 2B, 6 and 6A;
- K2 - Woodland of *Melaleuca preissiana* (similar to FCT4 and FCT5 – Gibson et al. 1994) within Precincts 1B, 2A and 6; and
- K3 - Heathland of *Regelia ciliata* and *Hypocalymma* spp. with emergent *Melaleuca preissiana* (similar to FCT4 and FCT5 – Gibson et al. 1994) - within Precinct 6.

BUSHLAND CONDITION

The condition of all bushland areas of the airport was assessed in 2001 (Mattiske 2001b), 2006 (Mattiske 2006) and most recently in 2011 (Ecoscape 2011), where it was found to vary from 'excellent' to 'degraded'. Changes in bushland condition between 2001 and 2011 have been negligible, with 96% of the areas assessed as 'very good' to 'excellent' condition in 2011.

Under the Conservation Management Plan, bushland condition has been determined to be the most appropriate and practical measure for ensuring that the vegetation within Jandakot Airport's Conservation Precincts is maintained appropriately in order to provide suitable habitat for significant fauna and flora species. Bushland is maintained at levels of 'good' or above, with areas assessed as degraded triggering management intervention.

Bushland condition of the Jandakot Airport Conservation Precincts is assessed at least every 5 years.

RARE AND ENDANGERED FLORA

Two endangered flora species protected under the EPBC Act have been previously identified as occurring within Precincts 1A and 1B. These include:

- Grand Spider Orchid (*Caladenia huegelii*); and
- Glossy-leaved Hammer Orchid (*Drakaea elastica*).

Surveys by Mattiske (2010 and 2013) to identify new and previously recorded Glossy-leaved Hammer Orchids did not locate any plants and it is now suspected that it was initially misidentified and that no specimens are present on site. This is supported by the fact that the vegetation association where they were initially reported is not considered to be their typical habitat.

Surveys of the airport have confirmed populations of the Grand Spider Orchid in Precincts 1A and 1B, with 351 confirmed and suspected (i.e. yet to be confirmed via photographic record of flower) identified to date. A single suspected plant within Precinct 2B flowered in 2013 and has been confirmed as a different *Caladenia* species. No Grand Spider Orchids (or other rare and endangered species) have been located within Precincts 6 and 6A (Mattiske 2013).

JAH have consulted widely on management of the rare orchids on the airport site, including the State Department of Parks and Wildlife, Department of Environment and Botanic Gardens and Parks Authority. Management of the Grand Spider Orchid is undertaken in accordance with EPBC conditions of approval and detailed within the Conservation Management Plan. This includes:

- the establishment of Grand Spider Orchid monitoring quadrants and a monitoring programme;
- a site wide identification and tagging program and the establishment of a detailed Grand Spider Orchid database and photographic record;
- fencing erected and access restrictions imposed for all Conservation Precincts;
- funding by JAH of a five-year Integrated Orchid Research Programme undertaken by Botanic Gardens and Parks Authority; and

- salvage and translocations of individual Grand Spider Orchid plants in areas impacted by approved development.

JAH will continue to liaise with relevant authorities and experts regarding ongoing management and monitoring requirements for the Grand Spider Orchid following the completion of the Botanic Gardens and Parks Authority Integrated Orchid Research Programme.

WEEDS

The Jandakot Airport Weed Management Plan is a component of the Jandakot Airport Conservation Management Plan.

The Weed Management Plan establishes goals and objectives, and prioritises responses to the control of weeds based on the threat posed by each species. Weed species identified at the airport are allocated a priority rating and treated accordingly during the annual weed control programme.

In addition, the Jandakot Airport Weed Management Plan sets a target of maintaining weed cover at or below 20% (consistent with definitions for 'good' bushland Condition), with stable or declining weed diversity.

DIEBACK (PHYTOPHTHORA CINNAMOMI)

There are several dieback affected areas of bushland on the site. Areas of dieback are managed (and dieback free areas protected) via the implementation of the Jandakot Airport Dieback Management Plan, which is a component of the Conservation Management Plan.

A dieback survey and mapping was most recently undertaken in 2011, with ongoing surveys and assessments scheduled to occur triennially. The 2011 survey confirmed the presence of the five previously identified dieback infestations, primarily associated with damp areas. No new infestations were identified and the boundaries of infestation were found to be relatively stable with little spread noted, indicating that dieback management measures to date have been successful.

As dieback infested areas cannot be cured, the primary management focus is to minimise its spread and prevent new infestations. The management measures that will continue to be implemented are detailed within the Dieback Management Plan, and include:

- restricting access to dieback areas;
- enforcing strict hygiene measures;
- triennial dieback assessment and mapping of all Conservation Precincts; and
- triennial Phosphite treatment.

Dieback has been identified within Precinct 6. A Dieback Management Plan will be developed and implemented to ensure that risks are appropriately managed during clearing and development of Precinct 6.

FAUNA

Fauna is managed in accordance with the Conservation Management Plan. Fauna and fauna habitats in the Conservation Precincts and future development areas of Jandakot Airport have been well surveyed and are generally well represented in the Swan Coastal Plain region. The airport comprises of two habitat types: Banksia Woodland (H2, J1) and Melaleuca Woodland (K1, K2). Of the two habitat types, the Banksia Woodland has higher value as fauna habitat because of its vegetation structure and habitat complexity, providing elements important to a variety of fauna, including foraging habitat for Carnaby's Cockatoos.

Environmental assessments undertaken for the clearing and development of Precincts 6 and 6A have identified five *EPBC Act* listed fauna species that are known to occur or potentially occur within the Airport.

The three *EPBC Act* listed threatened species are:

- Carnaby's Black-cockatoo (*Calyptorhynchus latirostris*) – foraging non-breeding seasonal visitor;
- Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*) - potential foraging non-breeding occasional seasonal visitor; and
- Baudin's Black-Cockatoo (*Calyptorhynchus baudinii*) - potential occasional non-breeding seasonal visitor (noting there are no known records of Baudin's Black-Cockatoo occurring within a 5km radius of the airport).

The two *EPBC Act* listed migratory species that may potentially occur are:

- Rainbow Bee-eater (*Merops ornatus*) – seasonal visitor; and

- Fork-tailed Swift (*Apus pacificus*) – likely to fly over the airport rather than visit and utilise habitat noting there are no records of this species at the airport or nearby.

Other recorded species of conservation significance are the Western Brush Wallaby (*Macropus irma*) and the Southern Brown Bandicoot (*Isodon obesulus fusciventer*), which are listed as Priority 4 and Priority 5 respectively by the Department of Parks and Wildlife. Habitat for these species is well represented elsewhere on the Swan Coastal Plain.

Management measures to address potential impacts on fauna during clearing and development are addressed within the Construction Environmental Management Plan and the Conservation Management Plan. Monitoring and survey requirements for species of conservation significance, as well as thresholds for triggering management intervention, are also detailed within the Conservation Management Plan.

EPBC Act conditions of approval require the development of a Wildlife Fencing and Underpass Strategy, which is in the process of being implemented and will apply to the development of Precincts 6 and 6A. The Fencing and Underpass Strategy aims to find a balance between maintaining wildlife corridors and facilitating wildlife movement wherever possible, and the use of fencing and other barriers to prevent wildlife accessing areas where they may be harmed (and cause harm).

FERAL ANIMALS AND OVERABUNDANT NATIVE SPECIES

It is recognised that feral animal management within remnant bushland in an urban setting is a complex task, especially when there is increasing pressure from surrounding urban development and neighbouring properties are subjected to differing (or no) feral management practices. JAH has developed a Feral Animal Management Plan that addresses management of feral animals that may potentially occur at the airport, including foxes, cats, rabbits and bees.

The Feral Animal Management Plan also addresses management methods for domestic animals as well as potential overabundant native species.

Macropods (wallabies and kangaroos) as well as bird species may be considered overabundant native species in certain areas of the airport. Management methods are detailed within the Conservation Management Plan and Feral Animal Management Plan.

9.5.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- comprehensive review and amendment of the Conservation Management Plan, including management plans for weeds, dieback, feral animals and bushfires;
- development of Bushland Rehabilitation and Revegetation Guidelines and a Wildlife Fencing and Underpass Strategy;
- completion of weed and bushland condition surveys with Conservation Precincts;
- completion of Grand Spider Orchid surveys, monitoring and mapping;
- salvage and translocation of Grand Spider Orchids prior to approved clearing in Precinct 4;
- development and implementation of a weed control programme and establishment of weed monitoring quadrats;
- completion of dieback assessment, mapping and phosphite treatment;
- translocation of fauna from bushland prior to approved clearing;
- completion of surveys and habitat mapping for significant fauna species; and
- the installation of fauna exclusion fencing to prevent macropod access to aircraft movement areas.

9.5.3 TARGETS

Table 9.6 below lists proposed targets to ensure conservation and biodiversity values are appropriately considered and managed at Jandakot Airport.

Table 9.6 Biodiversity and Conservation Management Targets

Target	Timeframe
Implement the CMP (including Appendices/Sub-plans)	Ongoing as detailed within CMP
If required, amend CMP prior to clearing Precincts 6/6A.	Prior to clearing Precincts 6/6A (if required).
Undertake review of CMP and its associated appendices.	2018

9.6 CULTURAL HERITAGE

Objective: To minimise the impact of airport development on cultural heritage and manage sites in accordance with applicable legislative requirements.

9.6.1 OVERVIEW

EUROPEAN HERITAGE

Jandakot was utilised for grazing activities from 1867. Experienced vegetable and orchard gardeners were attracted to the Cockburn region when Fremantle and Perth grew rapidly due to Western Australia's gold rush. Rural housing developments commenced in the post war years and Jandakot Airport opened in 1963 following closure of the Maylands airfield. No European heritage sites have been registered within the City of Cockburn Local Government Inventory and Heritage List, the State Heritage Register or the Commonwealth Heritage List. There are also no visible signs of European heritage on site.

INDIGENOUS HERITAGE

Prior to the approval of the Jandakot Airport Master Plan 2009 and Environment Strategy 2009, JAH engaged Australian Interaction Consultants (AIC 2008) to undertake an Ethnographic and Archaeological Site Identification Survey of the areas to be impacted under the Jandakot Airport Master Plan 2009. The project area included the entire airport as well as some neighbouring properties.

Archival research revealed two sites (artefact scatters) which were believed to be within the airport boundary; Site 4309 Princep Road and Site 3513 Lukin Swamp. Several other sites were located on neighbouring properties.

The survey included liaison with the WA Department of Aboriginal Affairs, review of previously conducted surveys in the vicinity of the airport and an archaeological survey and an ethnographic survey involving the representatives of relevant Aboriginal groups. AIC concluded:

- no new ethnographic or archaeological sites were identified;
- a Cultural Heritage Management Plan should be developed;

- there is potential for intact archaeological deposits which may contain cultural materials in undisturbed areas of Jandakot Airport and monitoring of ground disturbing activities is recommended;
- previously identified Site 4309 Princep Road is no longer a site within the meaning of Section 5 of the *Aboriginal Heritage Act 1972*;
- DIA 3513 Lukin Swamp could not be located within Jandakot Airport; and
- at this time, a Section 18 application is not required for the Jandakot Airport Master Plan to proceed.

Noting that Precincts 6 and 6A are the only new area proposed to be developed under the Master Plan 2014, and considering that Precincts 6 and 6A were a component of the AIC 2008 survey, the above conclusions of AIC 2008 are still valid and applicable.

JAH has a Cultural Heritage Management Plan for managing heritage values at the airport. Developed in 2013 utilising the findings of AIC, the purpose of this plan is to ensure that JAH conducts its developments in a manner that complies with the *Airports Act 1996* and other statutory requirements in relation to areas of Aboriginal cultural significance.

All development involving clearing or earthworks must be undertaken in accordance with a Construction Environmental Management Plan. This plan will include a procedure whereby, should construction personnel discover any suspected culturally significant artefact, works will temporarily cease whilst expert archaeological advice is sought. This will include liaison with the WA Department of Aboriginal Affairs and relevant Aboriginal communities as appropriate.

9.6.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- the development of a Cultural Heritage Management Plan as a component of the Jandakot Airport Conservation Management Plan; and
- ongoing monitoring of clearing and earth disturbance activities by construction personnel for potential archaeological artefacts.

9.6.3 TARGETS

Table 9.7 below lists proposed targets for appropriate consideration and management of cultural heritage matters at Jandakot Airport.

Table 9.7 Cultural Heritage Management Targets

Target	Timeframe
Review and update Cultural Heritage Management Plan.	2018.
Monitor clearing and earth disturbance for Aboriginal and European heritage by construction personnel.	Ongoing as required - during all clearing and earth disturbance works.

9.7 GROUND BASED NOISE

Objective: To manage noise associated with construction and ground-based airport operations in accordance with applicable legislative requirements.

9.7.1 OVERVIEW

The Airport (Environment Protection) Regulations 1997 apply to noise derived from tenant and construction operations. The Regulations, and therefore the Environment Strategy do not directly apply to pollution generated by aircraft except for ground running, which is covered by the *Air Services Act 1995*, the *Air Navigation (Aircraft Energy Emissions) Regulations* and *Air Navigation (Aircraft Noise) Regulations*, and administered by Airservices Australia. Noise from aircraft is addressed in detail in Section 8.2.

Potential sources of ground based noise at the airport include:

- construction and demolition activities;
- aircraft maintenance and ground running;
- tenant activities;
- vehicle and plant use (including road traffic); and
- maintenance.

These sources of ground based noise can potentially cause nuisance to airport operators and the community, including neighbouring residents.

MONITORING AND MANAGEMENT

Tenant Operational Environmental Management Plans are required to address noise management for tenants that are assessed as having an inherent environmental risk of 'Moderate' or greater, as defined by the Tenant Environmental Risk Allocation and Auditing Frequency Criteria.

Construction activities are required to be undertaken in accordance with an approved Construction Environmental Management Plan, which must include noise management measures.

Due to the relatively benign land uses proposed in the commercial precincts (office, storage and warehouse) it is unlikely that there will be any significant noise impacts created offsite. The majority of the commercial precincts are remote from residential areas, and where they adjoin rural-residential areas or where particularly noisy activities are proposed to be located on the airport, buffers will be considered.

Noise complaints received by JAH are managed as environmental incidents and are documented and investigated. This process allows for corrective actions to be identified and implemented.

Should there be complaints regarding ongoing excessive ground based noise, noise monitoring may be undertaken. This monitoring will be undertaken in accordance with the *Airports (Environment Protection) Regulations 1997* and the relevant Australian Standards.

9.7.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- tenants that undertake operations that have the potential to create noise impacts are required to develop an Operational Environment Management Plan; and
- a Construction Environment Management Plan detailing noise mitigation measures is required for all construction activities that have the potential to result in noise impacts.

9.7.3 TARGETS

Table 9.8 below lists proposed targets aimed at ensuring that ground based noise is appropriately managed at Jandakot Airport.

Table 9.8 Ground Based Noise Management Targets

Target	Timeframe
Require that CEMPs are developed for all significant construction activities and incorporate measures to mitigate the potential impacts of noise.	Ongoing as required
Require that OEMPs developed by tenants incorporate measures to mitigate the potential impacts of noise.	Ongoing as required
All ground based noise complaints will be managed as environmental incidents and appropriately investigated in a timely manner.	Ongoing as required

9.8 WATER AND ENERGY RESOURCES

Objective: To manage and monitor water and energy consumption at Jandakot Airport.

9.8.1 OVERVIEW

Water and most sources of energy are derived from limited resources. Water and energy management have the potential to impact climate change, and climate change acts as an amplifier of the already intense competition over water and energy resources.

Jandakot water supply is provided by both scheme and groundwater. Irrigation is largely supplied from groundwater with some areas supplied from reclaimed wastewater or scheme water. All electricity is provided via mains power. JAH provides electricity and scheme water to all tenants and monitors consumption across the airport.

The Green Star tools, developed by the Green Building Council of Australia are predictive building sustainability framework tools which provide an overall score to signify best practice. As these are Australia-wide tools, buildings with Green Star accreditation (i.e. 4 star and above) lead the market and are widely recognised as innovative buildings. JAH has committed to ensuring that all new office buildings at the airport are designed to a minimum 4 Star Green Star Rating. This will also apply to any proposed new developments in Precinct 6.

WATER CONSUMPTION

SCHEME WATER

Table 9.9 below shows the annual scheme water consumption at Jandakot Airport since the Environment Strategy 2009:

Table 9.9 Annual Scheme Water Consumption since 2008/09

	Reporting Period				
	2008/09	2009/10	2010/11	2011/12	2012/13
Scheme Water Consumption (kL)	74,532	88,342	81,866	118,536	146,436

As was predicted within Environment Strategy 2009, scheme water consumption has increased in recent years as development has increased. This increased rate of water consumption will continue to rise throughout implementation of this Environment Strategy 2014 as development continues to increase and additional tenants become established and operational.

WATER EFFICIENCY MANAGEMENT PLAN

In consultation with the Water Corporation, Western Australia's largest water and wastewater services provider, JAH initially developed a Water Efficiency Management Plan in 2008. Following five years of implementation, the plan was reviewed and updated in 2013 for the next five years.

GROUNDWATER ABSTRACTION

JAH recognises that sound management of groundwater abstraction is essential to ensure that the water resources are available to all consumers, including Jandakot Airport.

JAH abstracts groundwater for irrigation and construction (primarily dust suppression) purposes via a network of bores. All groundwater abstraction bores are metered and water consumption rates are monitored monthly.

JAH has consulted with the WA Department of Water regarding management of groundwater resources and groundwater abstraction. All abstraction occurs under a conditioned licence issued by the Department of Water, and JAH provides the Department of Water with annual reports detailing groundwater abstraction volumes and groundwater quality monitoring results.

The Jandakot Airport Groundwater Management Plan will be amended in 2015 to include the management and reporting of groundwater abstraction.

ENERGY CONSUMPTION

Table 9.10 below shows the annual electricity consumption at Jandakot Airport during the implementation of Environment Strategy 2009.

Table 9.10 Annual Electricity Consumption since 2008/09

	Reporting Period				
	FY2009	FY2010	FY2011	FY2012	FY2013
Electricity Consumption (kWh)	2,288,903	5,050,189	6,951,111	12,543,422	15,055,952

Electricity consumption has increased at Jandakot Airport as development has increased. Electricity consumption at the airport will continue to increase during ongoing expansion and development at the airport throughout the implementation of the Environment Strategy 2014.

Tenant electricity use is metered and monitored. Tenants that use large volumes of natural resources (including electricity) are required to manage potential impacts via an Operational Environment Management Plan.

9.8.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- new office buildings designed to a minimum 4 Green Star standard;
- energy and scheme water usage by JAH and airport tenants is metered and monitored;
- all groundwater abstraction bores have been metered and water use is monitored monthly;
- landscaping has occurred in accordance with the JAH Landscape Design Guidelines, which promotes the use of native, water wise plant species; and
- Review and implementation of the Jandakot Airport Water Efficiency Management Plan.

9.8.3 TARGETS

Table 9.11 below lists proposed targets aimed at appropriate management of water and energy consumption at Jandakot Airport.

Table 9.11 Water and Energy Resource Management Targets

Target	Timeframe
All new office buildings are to be designed to a minimum 4 star Green Star rating.	Ongoing
Implement the Jandakot Airport Water Efficiency Management Plan.	Ongoing
Review and amend the Jandakot Airport Water Efficiency Management Plan.	2018
Monitor water usage at the airport.	Monthly (groundwater) Every two months (scheme water)
Report on water usage at the airport.	Annually
Amend Groundwater Management Plan to include groundwater abstraction.	2015
Review water efficiency guidance within the Jandakot Airport Tenant Environmental handbook and update if necessary.	2015
Monitor energy usage at the airport.	Monthly
Report on energy usage at the airport.	Annually

9.9 WASTE

Objective: To facilitate the storage and appropriate disposal of waste where possible.

9.9.1 OVERVIEW

Solid waste streams include construction and demolition waste, commercial wastes from airport operations and tenants and putrescible wastes from services such as aircraft maintenance facilities and flight schools which include accommodation. Liquid wastes are also generated by airport operations and commercial tenants. Traditionally, effluent from the airport has been disposed onsite via septic tanks and aerobic treatment units. Hazardous liquid wastes, which include chemical and hydrocarbon waste, are transported and disposed in accordance with the WA *Environmental Protection (Controlled Waste) Regulations 2004*.

Inappropriate storage, transport and disposal of hazardous and non-hazardous wastes can negatively impact soil and groundwater quality, ambient air quality and climate change. JAH recognises that waste management processes need to be managed to reduce negative impacts. This includes ensuring that waste streams do not exacerbate bird or animal hazards.

EFFLUENT DISPOSAL

Deep sewage, linked to the local municipal sewer system, has been connected to Jandakot Airport. This system currently services all new commercial developments well as some of the established areas of the airport.

Older established areas of the airport will be progressively linked to sewer in coming years. The majority of pre-existing small tenants continue to operate septic tanks. Larger pre-existing tenants have aerobic treatment units. In line with the Master Plan 2009, JAH has committed to connecting all facilities to sewage by 2024 where feasible.

Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), new facilities will install an approved aerobic treatment unit and operate that system until a reticulated sewer connection is installed by JAH. This exception applies only to aviation operations within Precinct 3.

Where disposal of effluent to sewer is not feasible or possible for existing facilities within Precinct 3 with septic systems, facilities will be assessed and, if warranted, instructed to upgrade to an approved aerobic treatment unit.

SOLID NON-HAZARDOUS WASTE DISPOSAL AND RECYCLING

The airport is serviced by the City of Cockburn's waste services, which is coordinated by JAH. The majority of tenants participate in this user-pays program which supplies 240L general waste mobile garbage bins to tenants for a fee per bin, with an additional 240L co-mingled recycling mobile garbage bin offered free of charge for each general waste bin. Both bins are emptied weekly by the Cockburn City Council. Whilst the number of bins has increased as the number of tenants has increased, the proportion of bins used for recycling has remained relatively constant at about 35%.

Other tenants, particularly those that produce large weekly waste volumes that require receptacles greater than 240L, have alternative means of non-hazardous general and recyclable rubbish disposal via direct contracts negotiated with other licensed service providers.

JAH promotes the recycling service to all tenants to increase recycling uptake and minimise waste to landfill.

INDUSTRIAL AND HAZARDOUS WASTE DISPOSAL

Any tenant proposing to discharge trade or industrial liquid waste into the sewer system must obtain a 'Permit to Discharge Industrial Waste' from the WA Water Corporation. This applies to waste water from wash bays and grease traps. Liquid wastes are not permitted to enter stormwater drains or soak into soil where it may enter the groundwater. Where connections to sewer are not available (i.e. established areas of Precinct 3 aviation operations), on-site discharge of wash water may be permitted where:

- written justification is provided by the tenant;
- a risk assessment has been undertaken;
- an approved treatment system is installed;
- the washing facility is approved via a development application and/or a building permit; and
- the activity is detailed in an endorsed Operational Environment Management Plan, including maintenance, monitoring and reporting requirements.

All volumes of controlled waste (i.e. tyres, asbestos, oils, batteries and other potentially hazardous wastes) are to be managed in accordance with relevant legislation, in particular *Environmental Protection (Controlled Waste) Regulations 2004*. Controlled waste can only be disposed of by licensed waste contractors, and relevant records must be maintained.

To assist with the disposal of controlled waste, JAH coordinates a waste 'wet-cell' battery collection and recycling service. This service is promulgated to all airport tenants 3-4 times per year to coincide with scheduled collection dates, although JAH staff will collect waste batteries from tenants outside of these designated days upon request.

MONITORING AND MANAGEMENT

Unlike major airports where waste generation and recycling is centred around a central passenger terminal which in turn forms the basis of waste monitoring programs, Jandakot Airport has no central waste management facility.

Tenants that generate large volumes of general waste and/or volumes of controlled waste are required to

develop an Operational Environment Management Plan in which waste management practices are detailed. Tenant waste storage and disposal practices are monitored through regular tenant audits.

9.9.2 ACHIEVEMENTS

Over the five year period of the Environment Strategy 2009, a range of commitments were achieved including:

- all new developments within Precincts 4 and 5 are connected to sewer;
- progressive expansion of the sewer connection to older established airport buildings within Precinct 3;
- inclusion of waste management and mitigation measures in tenant Operational Environment Management Plans; and
- development of a Construction Environment Management Plan template (and subsequent development and implementation of the Plan) that includes waste management and mitigation measures.

9.9.3 TARGETS

Table 9.12 below lists proposed targets for waste management at Jandakot Airport.

Table 9.12 Waste Management Targets

Target	Timeframe
All new developments in Precinct 4, 5, 6 and 6A to be constructed with connection to sewer.	Ongoing
Effluent (sewage and greywater) to be disposed to sewer*.	2024
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), new facilities will install an approved ATU.	Ongoing
Where disposal of effluent to sewer is not feasible or possible (due to distance of facility from a sewer connection), existing facilities with septic systems will be assessed and, if warranted, instructed to upgrade to an approved ATU (applies to Precinct 3 outside of UWPCA only).	2024
Require that OEMPs developed by tenants incorporate measures to manage and mitigate the potential impacts of waste.	Ongoing as required
Require that CEMPs are developed for all significant construction activities and incorporate measures to manage and mitigate the potential impacts of waste.	Ongoing as required
*With the possible exception of a few small, isolated tenants within Precinct 3 outside of the UWPCA where reticulated sewer connection is not feasibly possible.	

10. STAKEHOLDER CONSULTATION

10.1 CONSULTATION STRATEGY

The successful development of Jandakot Airport depends on productive interaction with the wide range of stakeholders who are impacted by, and who impact, the development of the airport.

Prior to the preparation of this Master Plan, JAH prepared a consultation strategy to guide the consultation process and to ensure that all stakeholders had the opportunity to contribute to the preparation of the document. This consultation strategy had regard to the 'Airport Development Consultation Guidelines', released in October 2012 by the Department of Infrastructure and Regional Development, which provides recommendations for the consultation to be undertaken as part of the master plan process. The Guidelines state that an effective consultation program does not necessarily mean that all interested parties will be satisfied with the outcomes, but rather, that it is about ensuring that a proposal has been fully explored, concerns identified and alternatives considered. The consultation strategy also ensured that the relevant requirements under the *Airports Act 1996* were met.

10.2 STAKEHOLDER CONSULTATION

All of the Jandakot Airport master plans have involved consultation with a wide range of stakeholders, including State and Local Government, airport tenants, aircraft operators, and community groups.

JAH has continued active engagement with stakeholders during the five year period of the Master Plan 2009 and during the development of this Master Plan 2014. This ongoing consultation includes JAH participation in the following forums:

- Jandakot Airport Community Aviation Consultation Group (quarterly)
- Perth Airports Municipalities Group (quarterly)
- Jandakot Regional Park Community Advisory Committee (quarterly)
- Jandakot Chief Flying Instructor and Chief Pilots Meeting (quarterly)

10.3 PRELIMINARY CONSULTATION

The development of the Preliminary Draft Master Plan 2014 involved consultation with a wide range of stakeholders at various levels and stages.

The following agencies and organisations were directly engaged in the development of the Preliminary Master Plan:

- Department of Infrastructure and Regional Development (Commonwealth)
- Department of the Environment (Commonwealth)
- WA Department of Planning (State)
- Main Roads WA (State)
- City of Cockburn (Local)
- Airservices Australia
- Civil Aviation Safety Authority

The Jandakot Airport Community Aviation Consultation Group, which comprises representatives from Federal, State and Local Governments, Airservices Australia, aircraft operators, and local community organisations, was kept informed about the program and contents of this Master Plan.

Stakeholder workshops were held with aviation operators to review the proposed airfield layout and operations.

Briefing sessions were also held in December 2013 with State and Local Government agencies, airport tenants and community and resident groups.

10.4 FORMAL PUBLIC COMMENT PERIOD

In accordance with Section 79 of the Airports Act, the Preliminary Master Plan was made available for public comment for a period of 60 business days.

- An advertisement was placed in The Weekend West newspaper on Saturday, 23 August 2014 (average circulation 259,771 and average readership 670,000) advising that the Preliminary Draft Master Plan was available for public comment until 5pm Tuesday 18 November 2014;
- Printed copies of the Preliminary Draft Master Plan were available for viewing and purchase from the JAH Airport Management Centre during the public comment period;
- The Preliminary Draft Master Plan was published on the Jandakot Airport website for viewing and download, free of charge. During the public comment period there were a total of 886 unique views of the website pages publishing the Preliminary Draft Master Plan (Corporate > Master Plan and a home page quick link).

As required by the Airports Act, written notice of JAH's intention to give the Minister for Infrastructure and Regional Development a Draft Jandakot Airport Master Plan 2014 for his consideration was sent to:

- WA Minister for Planning, Culture and the Arts;
- WA Department of Planning;
- City of Canning;
- City of Cockburn; and
- City of Melville.

Under the Act, any comments received during the public comment period must be considered by JAH. Following the public comment period, JAH has reviewed and assessed all comments, and where appropriate, changes were made to the Preliminary Draft Master Plan.

10.5 SUBMISSION OF DRAFT MASTER PLAN TO THE MINISTER

After public comments were received and considered, the Preliminary Draft Master Plan was prepared as a Draft Master Plan which was then submitted to the Commonwealth Minister for Infrastructure and Regional Development on 1 December 2014 for approval.

In accordance with Sections 79 and 80 of the Act, the submission of the Draft Master Plan to the Minister was accompanied by the following material:

- copies of comments received during the public comment period; and
- a written certificate signed on behalf of JAH containing:
 - a list of names of the people or organisations that provided written comments to the Preliminary Draft Master Plan.
 - a list of the names of the people or organisations consulted and the topics addressed as part of the preliminary consultations.
 - a summary of the comments received during the public comment period.
 - evidence that JAH gave due regard to those comments.

10.6 PUBLICATION OF THE FINAL MASTER PLAN

Master Plan 2014 was approved by the Minister for Infrastructure and Regional Development, the Hon. Warren Truss, on 17 February 2015.

In accordance with Section 86 of the Act, JAH undertook the following notifications upon approval of this Master Plan:

- published newspaper notices advising that the Master Plan has been approved;
- made copies of the approved Master Plan available for inspection in person at the Jandakot Airport Management Centre; and
- made a copy of the approved Master Plan available on the Jandakot Airport website.

11. IMPLEMENTATION

The concept outlined in this Master Plan represents current views of expected development at Jandakot Airport.

11.1 FURTHER APPROVALS

Development approval requirements for Jandakot Airport are administered under the *Airports Act 1996*. Approval of the master plan does not necessarily constitute approval of the proposed developments. The *Airports Act 1996*, and associated regulations, requires further assessment and approval processes to occur, including the preparation of major development plans if applicable and building permits from the Airport Building Controller.

11.1.1 MAJOR DEVELOPMENT PLAN

Major development plans (MDPs) will be required for designated major airport developments, as set out in Section 88 of the Act. Such development proposals are the subject of further community consultation, environmental assessment and Ministerial approval.

As outlined in Section 2.2.1, a major development plan is required to be prepared for the construction of the fourth runway and altering existing runways. The Draft MDP for the fourth runway, lengthening of existing runway 06R/24R, lengthening of existing runway 12/30 (future 12R/30L) and taxiway augmentation works will be released for public comment on approval of this Master Plan 2014.

Section 91 of the Act requires an MDP to be consistent with the final master plan for the airport, and requires that the MDP include the following:

- the airport-lessee company's objectives for the development;
- the airport-lessee company's assessment of the extent to which the future needs of civil aviation users of the airport, and other users of the airport, will be met by the development;
- a detailed outline of the development;
- whether or not the development is consistent with the Commonwealth airport lease for the airport;
- whether or not the development is consistent with the final master plan;

- if the development could affect flight paths or noise exposure levels at the airport, and the effect that the development would be likely to have on those levels;
- if the development could affect flight paths at the airport, and the effect that the development would be likely to have on those flight paths;
- the airport-lessee company's plans, developed following consultations with the airlines that use the airport, local government bodies in the vicinity of the airport and—if the airport is a joint user airport—the Defence Department, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels;
- the likely effect of the proposed developments on traffic flows at the airport and surrounding the airport, employment levels at the airport, and the local and regional economy and community, including an analysis of how the proposed developments fit within the local planning schemes for commercial and retail development in the adjacent area; and
- the assessment of the environmental impacts that might reasonably be expected to be associated with the development and the airport lessee company's plans for dealing with these environmental impacts.

11.1.2 DEVELOPMENT APPROVAL

Prior to a third party commencing new development on airport, alterations to an existing facility, or a change in use of an existing facility, a formal consent for the works is required from JAH in the form of a Development Approval. Applications for Development Approval are required to comply with the Jandakot Airport Leasing and Development Guidelines.

11.1.3 BUILDING PERMIT

Once Development Approval is granted by JAH, a Building Permit must be obtained from the Airport Building Controller (ABC) under the provisions of the *Airports (Building Control) Regulations 1996*. The ABC is also advised by the Airport Environmental Officer (AEO). Both the ABC and AEO are independent of Jandakot Airport and are respectively contracted to, and employed by the Department of Infrastructure and

Regional Development. As part of the Building Permit process consent from Jandakot Airport must also be obtained. This consent ensures that the proposed works are in line with the Master Plan and an MDP if required.

11.2 IMPLEMENTATION

The implementation of the Master Plan will require flexibility to take into account fluctuations in economic activity and aviation requirements. Planning by its nature is a dynamic activity requiring continuous monitoring. Jandakot Airport is committed to providing its tenants with the aviation facilities identified in this Master Plan in a timely manner.

It is anticipated that the airport works will be implemented in the following sequence:

1. Clearing and bulk earthworks infrastructure for Precinct 6 and 6A and the fourth runway
2. Construction of taxiway K and extension of runway 12/30 (due to the shorter length of runway 12/30, in certain weather conditions there are limitations for a number of aircraft types. As a result, local operators have requested that the lengthening of runway 12/30 be completed before works commence on the extensions of runway 06L/24R to ensure minimal interruption to flight operations).
3. Extension of runway 06L/24R and associated taxiways works.
4. Development of Precinct 6 and 6A sites.
5. Development of the fourth runway 12L/30R and associated works (including relocation of the NDB and Bureau of Meteorology weather station).

11.3 REVIEW

The Act provides for the final master plan to remain in force for five years. Consequently, this Master Plan will be again reviewed and replaced in 2019. The Act also provides that an existing approved master plan remains in force until a new master plan is approved, and includes provisions for minor amendments to the master plan, and for the Minister to direct another master plan to be prepared.

APPENDIX A – AIRPORTS ACT 1996 AND AIRPORTS REGULATIONS 1997 REQUIREMENTS

AIRPORTS ACT 1996 Section 70	
(2) The purposes of a final master plan for an airport are:	Chapter 2
(a) to establish the strategic direction for efficient and economic development at the airport over the planning period of the plan;	
(b) to provide for the development of additional uses of the airport site;	Chapters 3, 4 and 5
(c) to indicate to the public the intended uses of the airport site;	Chapters 3, 4, 5 and 7
(d) to reduce potential conflicts between uses of the airport site, and to ensure that uses of the airport site are compatible with the areas surrounding the airport;	Chapters 2, 3, 4, 5 and 8
(e) to ensure that all operations at the airport are undertaken in accordance with relevant environmental legislation and standards;	Chapter 9
(f) to establish a framework for assessing compliance at the airport with relevant environmental legislation and standards;	Chapter 9
(g) to promote the continual improvement of environmental management at the airport.	Chapter 9
AIRPORTS ACT 1996 Section 71	
(a) the airport-lessee company's development objectives for the airport;	Chapter 1
(b) the airport-lessee company's assessment of the future needs of civil aviation users of the airport, and other users of the airport, for services and facilities relating to the airport;	Chapters 1, 3 and 4
(c) the airport-lessee company's intentions for land use and related development of the airport site, where the uses and developments embrace airside, landside, surface access and land planning/zoning aspects;	Chapters 3, 5 and 6
(d) an Australian Noise Exposure Forecast (in accordance with regulations, if any, made for the purpose of this paragraph) for the areas surrounding the airport;	Chapter 8
(da) flight paths (in accordance with regulations, if any, made for the purpose of this paragraph) at the airport;	Chapter 8
(e) the airport-lessee company's plans, developed following consultations with the airlines that use the airport and local government bodies in the vicinity of the airport, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels;	Chapter 8
(f) the airport-lessee company's assessment of environmental issues that might reasonably be expected to be associated with the implementation of the plan;	Chapter 9
(g) the airport-lessee company's plans for dealing with the environmental issues mentioned in paragraph (f) (including plans for ameliorating or preventing environmental impacts);	Chapter 9
(ga) in relation to the first 5 years of the master plan--a plan for a ground transport system on the landside of the airport that details:	Chapter 6
(i) a road network plan;	
(ii) the facilities for moving people (employees, passengers and other airport users) and freight at the airport;	Chapter 6
(iii) the linkages between those facilities, the road network and public transport system at the airport and the road network and public transport system outside the airport;	Chapter 6
(iv) the arrangements for working with the State or local authorities or other bodies responsible for the road network and the public transport system;	Chapter 6
(v) the capacity of the ground transport system at the airport to support operations and other activities at the airport;	Chapter 6
(vi) the likely effect of the proposed developments in the master plan on the ground transport system and traffic flows at, and surrounding, the airport;	Chapter 6
(gb) in relation to the first 5 years of the master plan--detailed information on the proposed developments in the master plan that are to be used for :	Chapters 1 and 5
(i) commercial, community, office or retail purposes;	
(ii) for any other purpose that is not related to airport services;	Chapter 3
(gc) in relation to the first 5 years of the master plan--the likely effect of the proposed developments in the master plan on:	Chapters 1 and 5
(i) employment levels at the airport;	

(ii) the local and regional economy and community, including an analysis of how the proposed developments fit within the planning schemes for commercial and retail development in the area that is adjacent to the airport;	Chapter 3
(h) an environment strategy that details:	Chapter 9
(i) the airport-lessee company's objectives for the environmental management of the airport;	
(ii) the areas (if any) within the airport site which the airport-lessee company, in consultation with State and Federal conservation bodies, identifies as environmentally significant;	Chapter 9
(iii) the sources of environmental impact associated with airport operations;	Chapter 9
(iv) the studies, reviews and monitoring to be carried out by the airport-lessee company in connection with the environmental impact associated with airport operations;	Chapter 9
(v) the time frames for completion of those studies and reviews and for reporting on that monitoring;	Chapter 9
(vi) the specific measures to be carried out by the airport-lessee company for the purposes of preventing, controlling or reducing the environmental impact associated with airport operations;	Chapter 9
(vii) the time frames for completion of those specific measures;	Chapter 9
(viii) details of the consultations undertaken in preparing the strategy (including the outcome of the consultations);	Chapter 9
(ix) any other matters that are prescribed in the regulations;	Chapter 9
(j) such other matters (if any) as are specified in the regulations.	Chapter 9

Matters provided by Regulations:	
AIRPORTS REGULATIONS 1997 – Reg 5.02 – Contents of draft or final master plan-general	
(1) For paragraphs 71 (2) (j) and (3) (j) of the Act, the following matters are specified:	Chapter 8
(a) any change to the OLS or PANS-OPS surfaces for the airport concerned that is likely to result if development proceeds in accordance with the master plan;	
(b) for an area of an airport where a change of use of a kind described in subregulation 6.07 (2) of the Airports (Environment Protection) Regulations 1997 is proposed:	Chapter 6
(i) the contents of the report of any examination of the area carried out under regulation 6.09 of those Regulations;	
(ii) the airport-lessee company's plans for dealing with any soil pollution referred to in the report.	Chapter 9
(2) For section 71 of the Act, an airport master plan must, in relation to the landside part of the airport, where possible, describe proposals for land use and related planning, zoning or development in an amount of detail equivalent to that required by, and using terminology (including definitions) consistent with that applying in, land use planning zoning and development legislation in force in the State or Territory in which the airport is located.	Chapters 3 and 5
(3) For subsection 71 (5) of the Act, a draft or final master plan must:	Chapter 3
(a) address any obligation that has passed to the relevant airport-lessee company under subsection 22 (2) of the Act or subsection 26 (2) of the Transitional Act;	
(b) address any interest to which the relevant airport lease is subject under subsection 22 (3) of the Act, or subsection 26 (3) of the Transitional Act.	Chapter 3
(4) In subregulation (1): "OLS and PANS-OPS surface" have the same meanings as in the Airports (Protection of Airspace) Regulations.	

APPENDIX B – PRE-EXISTING INTERESTS IN JANDAKOT AIRPORT

Interest Holder(s)	Type	Date Registered	Purpose	Location
Ampol Exploration Ltd, Shell Development (Australia) Pty Ltd, Texaco Overseas Petroleum Co., California Asiatic Oil Co.	Easement	19 November 1975	Pipeline	Precincts 1A and 4
Australian and Overseas Telecommunications Corporation Ltd	Caveat	4 June 1992	Telephone Exchange site	Precinct 3
Airservices Australia	Lease	19 September 1996	Non Directional Beacon site	Precinct 3
Airservices Australia	Lease	13 February 1997	Air Traffic Control tower site	Precinct 3
Civil Aviation Safety Authority (Transferred to Minister for Training 17 January 2002)	Lease	11 May 1999	CASA building (now Polytechnic West AeroSpace Training Centre)	Precinct 3

APPENDIX C – ABBREVIATIONS

In this document, unless the contrary intention is indicated:

Act means the *Airports Act 1996* as amended from time to time

AHD means Australian Height Datum

Airservices means Airservices Australia

ANEC means Australian Noise Exposure Concept

ANEF means Australian Noise Exposure Forecast

ANEI means Australian Noise Exposure Index

AS2021 means the Australian Standard 2021-2000: Acoustics – Aircraft Noise Intrusion – Building Siting and Construction, as published by Standards Australia

ATC means Airservices Australia Air Traffic Control

AWS means automatic weather station

CASA means the Civil Aviation Safety Authority

DME means distance measuring equipment

FAA means the United States Federal Aviation Administration

GA means general aviation

GPS means Global Positioning System

HLS means helicopter landing site

ICAO means the International Civil Aviation Organization

ILS means instrument landing system

INM means integrated noise model

MDP means major development plan

NASF means the National Airports Safeguarding Framework

NASAG means the National Airports Safeguarding Advisory Group

NDB means non-directional beacon

JAH means Jandakot Airport Holdings Pty Ltd, the

airport-lessee company for Jandakot Airport

Minister means the Federal Minister for Infrastructure and Regional Development (previously Minister for Infrastructure, Transport, Regional Development and Local Government)

MOS means the Civil Aviation Safety Authority's Manual of Standards, issued under Part 139 of the *Civil Aviation Safety Regulations 1998*

MRS means Metropolitan Region Scheme

OLS means Obstacle Limitation Surfaces

PANS-OPS means Procedures for Air Navigation Services – Aircraft Operations

PAPI means precision approach path indicator

SID means standard instrument departure

STAR means standard arrival route

WAPC means Western Australian Planning Commission

APPENDIX D – REFERENCES

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APPENDIX E – CONSULTANCIES

The following consultancies were used for the specialist input required for the preparation of this Master Plan 2014.

Aeronautical	Airbiz Aviation & Airspace Design Solutions Aerodrome Management Services
Civil Engineering	BG & E
Economic	MacroPlan Dimasi
Environmental	ENV Australia and 360 Environmental
Ground Transport	Transcore
Hydraulic Engineering	Wood & Grieve Engineers
Survey and Graphic Figures	McMullen Nolan Group
Town Planning	TPG Town Planning, Urban Design and Heritage