

F/A-18F – Australian Super Hornet Noise Management Plan

Version 4.0



Approved by:

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AMENDMENT HISTORY

Version	Date	Minister's Approval Date	Comments
1.0	09 Mar 2010	N/A	First issue.
2.0	22 Mar 2010	24 Mar 2010	Incorporating changes requested by Department of Environment, Water, Heritage and the Arts.
2.1	16 Apr 2012	N/A	Annual review.
3.0	31 Dec 2015	04 Apr 2016	Re-issue. - Incorporates required changes evident after five years of Air Force operational experience and data analysis. - Considers recommendations from the Compliance Report by the Aircraft Noise Ombudsman conducted in August 2015.
4.0	29 Sep 2020		Rewrite incorporating: - Removal of superfluous background information. - Changes to support introduction of the EA-18G. - Second round noise modelling. - Updated base map. - A more accurate depiction of existing Instrument Approach flight paths. - Incorporation of recommendations from 2019 audit.

ANNUAL REVIEW

Year	Date	Reviewer
2021		
2022		
2023		
2024		
2025		

DOCUMENT CONTROL

The document is to be reviewed annually by RAAF Amberley Air Base Executive Officer or their delegate, in consultation with relevant Force Element Group and other applicable stakeholders. Annual reviews are conducted in accordance with the [Air Force Aircraft Noise Management Strategy](#)¹. Annual reviews do not need the Minister's approval.

Reviews are to occur with 'Track Changes' function engaged. All reviews **must** be provided to the Staff Officer Aircraft Noise Management in Air Force Headquarters before being sent for signature of the Senior Australian Defence Force Officer.

Should there be significant changes in the document, the 'Tracked Changes' document is to be provided to the Department the Minister is representing via the Staff Officer Aircraft Noise Management. The document will be reviewed prior to approval. A new version will be issued and approval **must** be gained from the Minister's office before being published. Once approval is reviewed, this document **must** be published on the [Aircraft Noise](#)² webpage within three (3) months.

¹ Webpage link
[https://www.defence.gov.au/aircraftnoise/_Master/Docs/Default/AirForceAircraftNoiseManagementStrategyBrochure2018.pdf]
² Webpage link [https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp]

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F/A-18F AND EA-18G NOISE MANAGEMENT PLAN

PURPOSE

1. The purpose of F/A-18F Super Hornet Noise Management Plan is to describe the procedures and limitations applying to the operation of the F/A-18F and EA-18G from RAAF Base Amberley.

BACKGROUND

2. In March 2010 the Royal Australian Air Force introduced into service 24 F/A-18F Super Hornet aircraft at RAAF Base Amberley. In accordance with the requirements of the Environment Protection and Biodiversity Conservation Act 1999 operation of the Super Hornet was approved by the Minister for Environment Protection, Heritage and the Arts (The Environment Minister) subject to the Department of Defence meeting conditions attached to the approval. The approval was supported by outcomes of the 2009 Public Environment Report which included two rounds of public consultation. In April 2014 the Department of the Environment issued a variation to the original conditions attached to the approval³.

3. Under the conditions attached to the approval, the Department of Defence is required to implement the following plans and strategies for operation of the Super Hornet at RAAF Base Amberley:

- a. Super Hornet Noise Management Plan
- b. Noise Monitoring and Complaints Handling Strategy
- c. Super Hornet Noise Mitigation and Complaint Resolution Strategy
- d. Air Quality Monitoring Plan⁴.

4. Cross referencing of the conditions attached to the approval are provided in [Annex A](#) and are accurate for the date of this plan.

5. From February 2017 the Royal Australian Air Force has operated 12 EA-18G Growler aircraft from RAAF Base Amberley, alongside the 24 F/A-18F Super Hornet aircraft. The EA-18G Growler is a derivative of the F/A-18F Super Hornet and shares the same overall airframe design and uses the same engines. In order to ensure that the introduction of the EA-18G to RAAF Amberley did not result in a significant increase in noise impact compared to that forecast in 2009 with the introduction of the F/A-18F, Air Force developed revised departure and arrival profiles for the F/A-18F and EA-18G. Modelling of these profiles conducted in 2016 and 2017 confirms that the increased forecast in movements has not resulted in a significant negative change to the noise footprint forecast in the 2009 Public Environment Report.

6. In 2019 the Aircraft Noise Ombudsman (ANO) conducted the second independent review on the compliance to conditions for aircraft noise management⁵. Recommendations to improve compliance with the conditions were provided and have been used to update this Noise Management Plan. The recommendation and actions are listed in [Annex B](#) of this plan.

³ Conditions of approval can be accessed from the Department of Defence [Aircraft Noise](#) website [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/Australian%20Super%20Hornet%20-%20Variation%20notice.pdf]

⁴ All plans and strategies can be accessed from the Department of Defence [Aircraft Noise](#) website [https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp]

⁵ Link to report [https://www.defence.gov.au/id/_Master/docs/Envrionment/Amberley/Independent-Compliance-Audit-2019(ANO).pdf]

APPLICABILITY

7. The Super Hornet Noise Management Plan applies to operation of RAAF F/A-18F Super Hornet and E/A-18G Growler aircraft at RAAF Base Amberley. As the F/A-18F and EA-18G share the same fundamental airframe design and use the same engines, use of 'Super Hornet' within this plan refers to both the F/A-18F and the EA-18G.

8. The F/A-18F Super Hornet and E/A-18G Growler aircraft, like all aircraft at RAAF Base Amberley, operate in accordance with the procedures outlined in the [RAAF Base Amberley Aircraft Noise Management Plan](#)⁶. Both plans are to work concurrently to each other.

9. At times military fast jets from foreign forces will be required to operate from RAAF Base Amberley in support of achieving Defence strategic objectives. Although this plan provides planned movement numbers and flight profiles for the Royal Australian Air Force F/A-18F and EA-18G aircraft, the noise management principles outlined in this plan will be applied to other Air Force fast jet aircraft, and visiting foreign military fast jet aircraft where practical and safe to do so.

10. This plan does not provide procedures or requirements required to meet Workplace Health and Safety obligations. Adherence to the requirements of this plan is not required if it is considered that adverse Workplace Health and Safety outcomes might result.

SCOPE

11. The scope of this Plan is defined by the requirements of the Condition 1 of the 2014 Variation of Approval of Super Hornet flying operations at RAAF Base Amberley. This plan therefore addresses:

- a. Standard Super Hornet flying operations from RAAF Base Amberley, including the number and timing of aircraft movements and design of flight paths and flight procedures to reduce aircraft noise effects,
- b. Description of how deviations from standard Super Hornet flying operations are managed and
- c. A communication strategy.

COMPLIANCE WITH THIS PLAN

12. This plan replaces the F/A-18F Super Hornet Noise Management Plan Version 3.0 dated 31 Dec 2015. A rationale for changes is covered in [Annex C](#) of this plan. Compliance with the F/A-18F Super Hornet Noise Management Plan Version 4.0 is required in accordance with the varied Conditions of Approval for the Super Hornet. Once approved by Government, F/A-18F Super Hornet Noise Management Plan Version 4.0 will remain as the extant aircraft noise framework for Super Hornet until further amendment is approved by the Minister.

⁶ Webpage link [https://www.defence.gov.au/AircraftNoise/_Master/Docs/nfpms/amberley/RAAF-Base-AMB-BANMP.pdf]

F/A-18F AND EA-18G FLYING OPERATIONS AT RAAF BASE AMBERLEY

13. **Variations.** Procedures specified in this plan apply to RAAF F/A-18F and EA-18G operations, except where variations are allowed through approval procedures as specified in this plan.

14. **Updated Noise Modelling Outcomes**⁷. This plan is based on updated F/A-18F and EA-18G noise modelling conducted in 2017. Two rounds of noise modelling have been conducted, with the first round incorporating changes to Super Hornet flight paths and profiles that were developed based on a review of outcomes from [annual noise monitoring](#)⁸ conducted between 2011 and 2015. Whilst noise modelling from the first round did not show a significant increase in overall noise footprint compared to the 2009 Public Environment Report, it was determined that further changes to Super Hornet instrument approach recovery profiles would achieve an improved outcome, particularly to the north west of RAAF Base Amberley. The noise modelling outcomes included in [Enclosure One](#) to this plan reflect the maps derived from this second round of noise modelling outputs. The second round noise modelling does not show a significant increase in noise footprint compared to the 2009 Public Environment Report.

15. **Operating Runway.** The runway layout at RAAF Base Amberley is shown at Figure 1, with a base map and key locations included as [Annex D](#). F/A-18F and EA-18G operations are planned to be conducted on Runway 15 and Runway 33 (the 'main runway'). In exceptional circumstances such as in an aircraft emergency or during periods of main runway unavailability, the shorter cross runway (Runway 04 or Runway 22) may need to be used. In this case, take-offs to the west and arrivals to the east will be preferred within the constraints of prevailing weather conditions, noting that take-offs and landings are normally conducted into the prevailing wind direction.

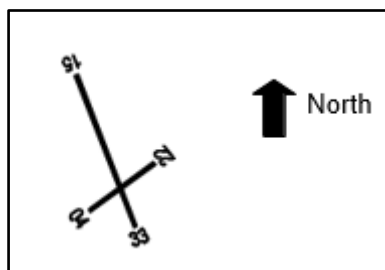


Figure One: RAAF Amberley Runway Orientation

16. **Take-off Power Settings.** The 2009 Public Environment Report forecast that 70% of take-offs would be conducted using afterburner power settings, usually when taking off at higher weights. Operational experience has identified that due to faster acceleration and higher immediate rates of climb, higher altitudes can be achieved faster with afterburner take-offs whilst still deselecting afterburner before the aircraft crosses the airfield boundary. This results in an overall improved noise outcome in the vicinity of the airfield. Accordingly, modelling reflected in this plan allows for 100% of departures using afterburner power settings.

⁷ Webpage link to ANEF [https://www.defence.gov.au/AircraftNoise/_Master/Docs/ANEF/2029_RAAFBASEAmberley.pdf]

⁸ See the Australian Super Hornet Annual Noise Reports from 2011 at webpage link [<https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp>]

17. **Departure Flight Paths.** Aircraft departing on Runway 33 will maintain runway heading until reaching four nautical miles before turning to departure heading, except for departures to north which will maintain runway heading until reaching six nautical miles. Aircraft departing on Runway 15 will maintain a southerly track until reaching four nautical miles before turning to departure heading⁹. For departures that require overflight of Ipswich or the suburbs of Brisbane, Super Hornets will initially turn to the west after reaching four nautical miles to enable climb to well above 10,000 feet altitude before tracking towards the east. In all cases aircraft will maximise rate of climb after take-off prior to reaching the four or six nautical mile position. Variations to the requirement to maintain track to four or six nautical miles can occur when the departure is conducted in periods of poor pilot visibility and if Air Traffic Control require an earlier or later turn to maintain positive de-confliction with other airborne aircraft.

18. Although the majority of F/A-18F and EA-18G departures will follow one of the standard departure routes as shown in [Annex E](#) of this plan, some final departure tracks may vary when required for operational outcomes, most often when aircraft are deploying away from RAAF Base Amberley and are required to join published air routes in civilian airspace.

19. The overall distribution of departure directions used in the 2017 noise modelling is based on 2015 operations, as follows:

- a. Airspace to the north-east: 25% compared to 45% in 2009 modelling
- b. Airspace to the south-east: 9% (not modelled in 2009)
- c. Airspace to the west: 60% compared to 40% in 2009 modelling
- d. Airspace to the south: 6% compared to 15% in 2009 modelling

20. **Arrival Flight Paths.** In periods of clear visibility, the majority of arrival flight paths, [Annex F](#), will be conducted via an 'Initial and Pitch' procedure as displayed in [Annex G](#). In periods of poor visibility or when required for training, arrivals will be conducted via an instrument approach or visual straight in approach procedure. These arrival procedures are shown in [Annex F](#) of this plan. The revised noise modelling in this plan reflects an updated overall percentage of arrivals via the Initial and Pitch procedure of 70%, compared to the 2009 Public Environment Report forecast of 80%. Percentage distributions of arrival directions used in the 2017 noise modelling are as per the departure percentage distributions.

21. **Circuit Procedures.** Aircraft returning to land via the Initial and Pitch procedure fly a circuit pattern from abeam the airfield to position for landing. Circuits are normally flown at 1500 feet above ground level, but occasionally may be flown lower in periods of poor weather or when required for aircrew training. To minimise noise impact to Ipswich suburbs to the east of the airfield, all F/A-18F and EA-18G circuit patterns are planned to be flown to the west of the main runway. Circuits may be flown after take-off when required for aircrew training or aircrew currency requirements. Only when required due to exceptional circumstances such as an aircraft emergency, unanticipated poor weather, or when required for Air Traffic Control de-confliction procedures, will circuits be flown to the east of the main runway or on the shorter cross runway.

⁹ The requirement to track to 6 nautical miles for departures to the north on runway 33, and the requirement to maintain a southerly track until reaching 4 nautical miles when departing from runway 15 are additional mitigation measure over those contained in the 2009 Public Environment Report. These new requirements are intended to reduce noise impact to the north east, west and south west of the base.

22. Historically, peak periods of circuits occur in January following the December/January reduced activity period, and during early periods of initial aircrew training. When flying circuits, aircrew will avoid extending the legs of the circuit unless required for Air Traffic Control de-confliction requirements. The circuit pattern used in the 2016 and 2017 noise modelling was updated to reflect the actual flight path which is closer to the runway than that modelled in 2009, achieving an improved noise exposure projection to the west of the runway, including in the vicinity of Walloon. The updated circuit pattern is shown in [Annex H](#) of this plan. Experience gained operating the EA-18G dictates a slightly wider circuit pattern may be flown than the F/A-18F due to configuration differences. However, the flight path flown is contained to that within Annex H and therefore within the latest noise modelling.

23. **Altitude Limitations in Proximity to RAAF Base Amberley.** Except when allowed by an approved variation, F/A-18F and EA-18G aircraft will not fly below 1 500 feet (450 metres) above ground level within 10 nautical miles (18.5 kilometres) of RAAF Base Amberley except when taking off, landing, or operating in the circuit.

24. **Planned Periods of Flying Operations.** The majority of F/A-18F and EA-18G operations will occur Monday to Friday within the period 7am to 7pm. Operations after 7pm will usually only be planned Monday to Thursday in regular blocks of night flying activity. All flying operations will be planned within the following constraints which remain consistent with the restrictions specified in the 2009 Public Environment Report, unless variation is approved by the Senior Australian Defence Force Officer in accordance with the procedures specified in this plan.

- a. No departures or arrivals between 11pm and 7am unless operationally required
- b. No continuous practice circuits after 10pm
- c. Weekend operations only when required for operational outcomes; or required to support events of public significance such as (for example) Australia Day, Anzac Day and Riverfire.
- d. Maximum of 46 weeks of planned flying operations per calendar year, with periods of respite from flying operations scheduled over the New Year and mid-year.
- e. Maximum of 20%¹⁰ of movements conducted between the period of 7pm and 11pm.

25. **Planned Movements.** RAAF F/A-18F and EA-18G annual movement forecasts are shown at Table one. The 2009 Public Environment Report noise modelling outcomes were based on an annual forecast of 4648 F/A-18F movements¹¹. For 2016 the forecast movement total was adjusted to 5261 movements and approved by the Department of Environment in accordance with the conditions attached to the Australian Super Hornet Flying Operations Approval. For 2017 the forecast F/A-18F movement total was adjusted to 4820 movements. With the staged introduction of the EA-18G Growler from February 2017 it was necessary to update noise modelling based on a forecast of 7700 combined F/A-18F and EA-18G movements, which represents the forecast steady state movement rate from the 2019-20 timeframe.

26. To support this increased movement rate, revised Super Hornet flight paths and vertical profiles were incorporated into noise modelling conducted in late 2016 with the

¹⁰ Historical rate of flying after 7pm between 2011 and 2015 has been 10%.

¹¹ An aircraft that conducts a single take-off followed by a single landing conducts two movements.

results demonstrating no significant increase in predicted noise footprint compared to that predicted in the 2009 Public Environment Report. Despite this assessment, it was identified that a further change to instrument approach ground tracks and profiles would improve the overall noise footprint at the higher aircraft movement rate. Modelling outputs of these further refined flight profiles are included in the enclosures to this plan.

27. In late 2018 F/A-18F & EA-18G were authorised for GPS based instrument approach procedures in bad weather and for training. These procedures utilise existing published flight paths that are already used by other aircraft types but have not previously been used by F/A-18F & EA-18G. There is expected to be no nett increase in instrument arrivals, such that the existing noise level will be shared amongst the flight paths depicted in the Enclosures.

28. Table one also includes forecast visiting military fast jet movements which are included in the noise modelling. Although visiting military jet movements are not subject to Department of Environment approval, they are included in this plan to acknowledge that the impact of military fast jet noise is not dependant on the operator of the aircraft.

Table One: Forecast Military Fast Jet Movements at RAAF Base Amberley

RAAF F/A-18F and EA-18G	Fast Jet Movements
- Arrivals and departures (combined)	6650
- Circuits (1 circuit counts as 2 movements)	525
Total F/A-18F and EA-18G movements	7700
Visiting Military Fast Jets	
- F/A-18 or F-35 equivalent arrivals and departures	900
- Hawk light fighter equivalent arrivals and departures	60

F/A-18F AND EA-18G GROUND ENGINE RUNNING

29. **Flightline Engine Testing.** Maintenance personnel are required to occasionally run F/A-18F and EA-18G engines on the flightline to perform required maintenance activities. The majority of engine run maintenance requires only idle power, however on occasions a momentary increase above idle is required, usually on one engine only. The following limitations apply to engine runs conducted in the normal Flightline parking positions:
- a. Between the hours of 7am and 10pm up to 80% power setting for a maximum of 60 minutes duration each time
 - b. Between 10pm and 7am only when required to achieve an urgent operational outcome that cannot be delayed, only above idle if absolutely necessary and for the minimum period possible and avoiding cycling of engine power settings.
30. Since the last version of this plan, 6 Squadron Flightline location has moved slightly. Being on the same tarmac area as previous, this change in location is not expected to have any adverse noise impact. There has been significant Base re-development at Amberley since the original Australian Super Hornet Public Environment Report and approval. An updated Base map is included in [Annex D](#) for accuracy purposes only as there is not expected to be any adverse F/A-18F & EA-18G noise impact from these changes.
31. **High Power Engine Running.** On a less frequent basis, an F/A-18F or EA-18G engine may be required to be ground run at high power settings up to and including full afterburner. These engine runs are conducted either on the main runway thresholds or at the Engine Test Cell. These runs will only be conducted above idle power between the hours of 7am and 10pm. Between 10pm and 7am the restrictions of paragraph 29.b apply.

VARIATIONS FROM PLANNED F/A-18F AND EA-18G FLYING OPERATIONS

32. **Foreseeable Variations.** From time to time a requirement to conduct F/A-18F or EA-18G flying operations in a manner different to that specified in this plan can be identified ahead of the event occurring. In these circumstances the RAAF Base Amberley Senior Australian Defence Force Officer (or promulgated delegate) can approve the variation taking into account the potential for adverse outcomes versus the operational benefit that will be achieved. It is not intended that approval of foreseeable variations by the Senior Australian Defence Force Officer becomes a means to achieve a permanent change to requirements of this plan. Foreseeable variations can include:

- a. Planned use of runway 04 or runway 22
- b. Weekend flying
- c. Planned flight below 1500 feet above ground level within 10 nautical miles of RAAF Base Amberley when not taking off or landing, or operating in the circuit
- d. Material changes to flight paths, including circuit direction
- e. Planned continuous circuits between 10pm and 7am
- f. Departures or arrivals at RAAF Base Amberley between 11pm and 7am
- g. Greater than the planned calendar year movements
- h. Flightline engine running above idle power between 10pm and 7am
- i. Engine runs above idle at the Engine Test Cell between 10pm and 7am.

33. **Unforeseeable Variations.** Occasionally divergences from the requirements of this plan are required, but cannot be predicted or pre-determined. In these circumstances, personnel involved are to prioritise minimising potential adverse outcomes for the public over operational outcomes, but not at the expense of maintaining safe operations. Some examples of unforeseen variations are:

- a. Variations to flight paths or vertical profiles which have unavoidably occurred as a result of aircraft emergency, hazardous weather, or directions from Air Traffic Control
- b. Use of runway 04 or runway 22 for take-off or landing due to an aircraft emergency or an unplanned unavailability of the main runway
- c. Flying operations after 11pm when originally planned to cease prior to that time but unforeseen delays occurred after departure
- d. Other deviations necessary to ensure that safety to military personnel or the public are not compromised.

COMMUNICATION

34. Promulgation of significant flying events likely to generate widespread significant public interest are promulgated on the [Air Force Flying Operations](https://www.airforce.gov.au/operations/flying-operations)¹² webpage. This includes promulgation of events of significance that have an effect on the noise footprint at and around RAAF Amberley, such as planned periods of night flying or known weekend flying.

35. In addition to the above RAAF Amberley will inform the public, as time and security requirements permit, via:

- a. The Amberley Consultative Working Group; and
- b. Media releases to local media outlets, including local newspapers.

36. Communication about changes to this plan will be provided to the Amberley Consultative Working Group, once approved by the Minister representing the Department administering the Environment Protection and Biodiversity Conservation Act 1999.

37. RAAF Amberley will maintain the required documents and copies of relevant communications within objective, Defences Record Management System.

¹² Webpage link [<https://www.airforce.gov.au/operations/flying-operations>]

ANNEX A – CROSS REFERENCE TO CONDITIONS OF APPROVAL

Condition	Evidence to address condition
1. The person taking the action must implement the approved Australian Super Hornet Noise Management Plan. The approved Australian Super Hornet Noise Management Plan must be revised to address any issues identified in the: - Noise Monitoring Program, as outlined in the approved Noise Monitoring Complaints Handling Strategy (condition 2); and - Period 1 Independent Audit of Compliance with the Conditions of Approval (condition 5) The revised Australian Super Hornet Noise Management Plan must be submitted to the Minister for approval by 31 December 2015. The approved revised Australian Super Hornet Noise Management Plan must be implemented in place of the Australian Super Hornet Noise Management Plan previously approved.	Extant – The Australian Super Hornet Noise Management Plan v3.0 was released in 2015 and is located on the Aircraft Noise¹³. v4.0, once approved, will be released in 2020.
2. The person taking the action must implement the approved Noise Monitoring and Complaints Handling Strategy.	Extant – Australian Super Hornet Noise Monitoring and Complaints Handling Strategy was released in 2016 and is located on the Aircraft Noise¹⁴. To be reviewed by 2021.
3. The person taking the action must implement the approved Australian Super Hornet Noise Mitigation and Complaint Resolution Strategy.	Extant – Australian Super Hornet Noise Mitigation and Complaint Resolution Strategy was released in 2016 and is located on the Aircraft Noise¹⁵. To be reviewed by 2021.
4. The person taking the action must implement the approved Air Quality Monitoring Plan.	Extant – Air Quality Monitoring Plan was released in October 2012 and is located on the Aircraft Noise¹⁶ website.
5. The person taking the action must ensure that an Independent Audits of Compliance with the conditions of approval including implementation of	a. Extant – <i>Review of Australian Super Hornet Flying Operations at RAAF Base</i>

¹³ Webpage link [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/ASH-Noise-Management-Plan.pdf]

¹⁴ Webpage link [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/AB7810530.pdf]

¹⁵ Webpage link [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/ASH%20Noise%20Mitigation%20and%20Complaints%20Resolution%20Strategy.pdf]

¹⁶ Webpage link [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/Air%20Quality%20Monitoring%20Plan.pdf]

Condition	Evidence to address condition
the requirements of approved plans is conducted for each of the following periods: - Period 1: from the date of the approval to 31 December 2014; - Period 2: from 1 January 2015 to 31 December 2018. Each auditor's report must be submitted to the Minister within 6 months of the end of the period to which the report applies. Each auditor's report must be published on the web site of the person taking the action within 3 months of the report being submitted to the Minister.	<i>Amberley August 2015</i>, Aircraft Noise Ombudsman (ANO), 12 Aug 2015, filed as DRMS: AB23867379. Report publically released on the Aircraft Noise¹⁷ website. b. Completed – <i>Compliance Audit of Australian Super Hornet Flying Operations at RAAF Base Amberley October 2019</i>, ANO, 24 Oct 2019, filed as DRMS: BP5676342. Report publically released on the Defence Infrastructure Division¹⁸ website, filed as DRMS: BS7210670. The report is also available of the Aircraft Noise¹⁹ website, filed as DRMS: BP8867126.
6. The person taking the action must publish on their web site all plans and strategies within 3 months of each plan or strategy being approved.	Actioned – As above. Directed – See Document Control section.
7. If the Minister believes that it is necessary or convenient for the better protection of listed threatened species or communities (s18 & s18A) to do so, the Minister may request that the person taking the action make specified revisions to the management plans specified in the conditions and submit the revised management plans for the Minister's written approval. The person taking the action must comply with any such request. The revised approved management plans must be implemented. Unless the Minister has approved a revised management plans then the person taking the action must continue to implement the management plans originally approved, as specified in the conditions.	Noted – No further action required unless requested by the Minister.
8. If the person taking the action wishes to carry out any activity other than IAW the management plans as specified in the conditions, the person taking the action must submit for the Minister's approval a	Noted & directed – See Compliance with this plan section.

¹⁷ Webpage link [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/2015HornetReport.pdf]

¹⁸ Webpage link [[https://www.defence.gov.au/id/_Master/docs/Envrionment/Amberley/Independent-Compliance-Audit-2019\(ANO\).pdf](https://www.defence.gov.au/id/_Master/docs/Envrionment/Amberley/Independent-Compliance-Audit-2019(ANO).pdf)]

¹⁹ Webpage link [<https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp>]

Condition	Evidence to address condition
revised version of that management plan The varied activity shall not commence until the Minister has approve the varied management plan/s in writing. The minister will not approve a varied management plan unless the revised management plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised management plan, that management plan must be implemented in place of the management plan originally approved. If the Minister approves the revised plan, program or strategy so submitted, the person taking the action must implement that plan, program or strategy instead of original approved.	
9. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval and make them available on request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the department's website. The results of audits may also be publicised through the general media.	Directed – See Communications section.

DEFINITIONS

Definitions applicable to the Variation to Conditions attached to Approval of the Australian Super Hornet Flying Operations, RAAF Base, Amberley, QLD (EPBC 2008/4410)²⁰, and this Noise Management Plan:

Approved A document approved in writing by the Minister.

Department The Australian Government Department administering the Environment Protection and Biodiversity Conservation Act 1999.

Minister The Minister responsible for administration of the Environment Protection and Biodiversity Conservation Act 1999.

²⁰ Webpage link [https://www.defence.gov.au/AirCraftNoise/_Master/Docs/Environment/Australian%20Super%20Hornet%20-%20Variation%20notice.pdf]

ANNEX B – RECOMMENDATIONS FROM 2019 COMPLIANCE AUDIT

1. The 2019 Aircraft Noise Ombudsman (ANO) report on the Compliance to Conditions for aircraft noise management found that Defence was meeting the intent of the Conditions of Approval and is managing aircraft noise issues effectively at RAAF Base Amberley. It was noted that RAAF Base Amberley was compliant with four of the eight conditions, non-compliant with three and one was not applicable. Lack of robust administrative procedures and documented evidence to demonstrate compliance was determined to be the cause of noncompliance.
2. The ANO identified 54 separate requirements to be assessed under the audit criteria. Of these, Defence was compliant with 39 requirements, non-compliant with nine, four were not applicable and two requirements were classified as undetermined due to a lack of evidence to establish a definitive finding.
3. In May 2020 the ANO released an Addendum to the 2019 audit due to an update in Independent Audit and Audit Report Guidelines. The update removed the 'undetermined' category. As such, the ANO determined that in each case where an 'undetermined' finding had been made, it would be revised to be 'non-compliant'. Noting this, of the 54 requirements Defence was compliant with 39 requirements, non-compliant with 11 and four were not applicable.
4. The ANO's conclusion remained unchanged from the original 2019 Audit in that Defence has complied with the intent of the Conditions of Approval.
5. The ANO has made nine recommendations and two suggestions aimed at improving Defence's compliance with the Conditions of Approval, all of which were accepted and are being implemented via the Remediation Action Plan, a summary of which is provided below.

ANO Recommendations	Defence Remediation Action
1. Defence should establish robust administrative systems that ensure it obtains the required approvals for changes to its activities prior to implementing those changes. These systems should ensure annual reviews are conducted that would enable the identification and early rectification of any non-compliances.	Defence has establish the Australian Super Hornet Conditions of Approval tracking spreadsheet to track items of compliance. This spreadsheet is shared between Air Force Headquarters, Headquarter Air Command and RAAF Amberley to enable a central location and consolidated repository for all Australian Super Hornet compliance requirements relating to noise management. Timeline – the tracking sheet and governing document were provided to the ANO on 31 August 2020.
2. Defence should re-instate or adopt new or additional record management practices to ensure it can demonstrate its compliance with the Conditions of Approval and the requirements of the	Headquarter Air Command has developed an internal audit process to audit Australian Super Hornet Conditions of Approval against the Noise Management Plan, Noise Monitoring and Complaints Handling

ANO Recommendations	Defence Remediation Action
plans and strategies required by these Conditions.	Strategy and Noise Mitigation and Complaint Resolution Strategy. Timeline – the audit process was established in May 2020 and is underway as part of a rolling review.
3. Defence should: a. Review its draft version 4.0 Noise Management Plan in light of the findings of this audit report, the questions and comments made to date by the Department of the Environment and Energy, and in consideration of any other changes or assumptions that may be now relevant; b. Ensure the revised Noise Management Plan retains a level of detail that is appropriate to its purpose as a public account of Defence's planned noise management activities and includes an appropriate requirement to regularly review the plan in light of any outcomes of its Noise Monitoring Program; c. Set out clearly the changes compared to the version 3.0 Noise Management Plan and outline the reasons for these; d. Re-submit the revised version 4.0 Noise Management Plan for approval in line with Condition 8 of its approval.	Defence has reviewed the Noise Management Plan v4.0. A table has been inserted into the plan to detail and compare changes between current and new version. The plan will be reviewed prior to submission to Department with considerations of recommendations made in the audit incorporated into the revised plan. Timeline – the management plan has been rewritten. Approval will depend on the Department of Agriculture, Water and the Environment process but is expected by December 2020.
4. Defence should regularly review its Noise Management Plan, with consideration to be given to relevant matters, including but not limited to: a. Any foreseeable variations approved by the Senior Australian Defence Force Officer - Amberley; b. Any changes to Super Hornet flying operations limitations or planning assumptions, which occur as a result of evaluation of the noise monitoring outcomes and the complaints process	Auditable criteria contained within the plan will tracked via the Australian Super Hornet Conditions of Approval spreadsheet. All plans will be reviewed on an annual basis. If no changes to the plan is required version numbers will remain the same and not go to Department for approval. If amendments/changes are made to the plan version numbers will change to whole numbers (i.e. 2.0) and will be submitted to the Department for approval before plan is

ANO Recommendations	Defence Remediation Action
detailed in the Noise Monitoring and Complaints Handling Strategy; and c. The results of audits of compliance with its Conditions of Approval for Australian Super Hornet Flying Operations.	published for use. Timeline – the timeline for implementation is the same as recommendation 2.
5. Defence should use its Annual Super Hornet Noise Reports to explicitly evaluate noise outcomes against the noise modelling undertaken for the Public Environment Report 2009, and also for any subsequent approved noise modelling undertaken.	The revised Noise Management Plan (v4.0) incorporates updated ANEF noise modelling, with “Number Above” maps that represent all aircraft types operating from RAAF Base Amberley, not just the F/A-18F and the EA-18G. The Annual Super Hornet Noise Report has been released and includes evaluation of noise outcomes against the noise modelling in the 2009 Public Environment Report, the approved Noise Management Plan and current noise modelling. Timeline – The report was approved on the 05 August 2020 and is available on the Aircraft Noise²¹ website.
6. Defence should table its Annual Super Hornet Noise Reports at the Amberley Consultative Working Group meetings and ensure this is minuted.	The Australian Super Hornet Annual Noise Report will be tabled at the first available Amberley Consultative Working Group after Defence has approved report. Tabling of report will be captured in the minutes. Timeline – Due to COVID-19 the Amberley Consultative Working Group is postponed until further notice. The Australian Super Hornet Annual Noise Report will be tabled at the first available Amberley Consultative Working Group.
7. Defence should regularly review its Noise Monitoring and Complaints Handling Strategy, with consideration to be given to relevant matters, including but not limited to: a. Any changes to the Noise Management Plan and Noise	The Noise Monitoring and Complaints Handling Strategy will be reviewed annually with considerations given to the points made in the recommendations and any other considerations identified during the internal audit process.

²¹ Webpage link [<https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp>]

ANO Recommendations	Defence Remediation Action
Mitigation and Complaints Resolution Strategy; b. Those arising through the complaints process detailed in the Noise Monitoring and Complaints Handling Strategy; and c. The results of audits of compliance with its Conditions of Approval for Australian Super Hornet Flying Operations.	Timeline – The plan was reviewed and approved in June 2020 and is available on the Aircraft Noise²² website.
8. Defence should identify and implement an effective method for publicly reporting on its actions in response to recommendations made in relation to its Conditions of Approval for Australian Super Hornet Flying Operations.	An annex has been added to the Australian Super Hornet Annual Noise Report to detail recommendations made to Defence during the reporting period, action taken by Defence and where the action taken was other than implementation of the recommendation in full, the reasons for the decision. Timeline – the timeline for implementation is the same as recommendation 5.
9. Defence should regularly review its Noise Mitigation and Complaints Resolution Strategy, with consideration to be given to relevant matters, including but not limited to: a. Any changes to the Noise Management Plan and Noise Monitoring and Complaints Handling Strategy; b. Those arising through the complaints process detailed in the Noise Monitoring and Complaints Handling Strategy; and c. The results of audits of compliance with its Conditions of Approval for Australian Super Hornet Flying Operations (note: Amendment made to wording of this recommendation).	The Noise Mitigation and Complaints Resolution Strategy will be reviewed annually with considerations given to the points made in the recommendations and any other considerations identified during the internal audit process. Timeline – The plan was reviewed and approved in June 2020 and is available on the Aircraft Noise²³ website.
Improvement Suggestion 1. Defence should include commentary in its Annual Super Hornet Reports that explains any reported activities where compliance	Defence has included commentary on the Australian Super Hornet Annual Noise report to match activities with conditions of approval.

²² Webpage link [<https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp>]

²³ Webpage link [<https://www.defence.gov.au/AirCraftNoise/Environment/PublicEnvironmentReport.asp>]

ANO Recommendations	Defence Remediation Action
with the Conditions of Approval is not otherwise readily apparent from the information in the report.	Timeline – the timeline for implementation is the same as recommendation 5.
Improvement Suggestion 2. Defence should include data and commentary in its Annual Super Hornet Reports that explicitly demonstrates its performance against each aspect of the Noise Management Plan requirements.	Defence has matched data in the Australian Super Hornet Annual Noise report to requirements in the Noise Management Plan. Timeline – the timeline for implementation is the same as recommendation 5.

ANNEX C – RATIONALE FOR CHANGES BETWEEN VERSION 3.0 AND 4.0

Change	Rationale
Complete rewrite and format update.	A rewrite occurred with the introduction of the E/A-18G Growler, Amberley facilities upgrades, updated Australian Noise Exposure Forecast (ANEF) maps, ANO audit recommendations, new procedural approach and departure actions, a more in-depth understanding of the capability and overall obligation for continuous improvement.
Condensed background information throughout the plan.	Previous plan provided superfluous background information that was not needed to meet its intended outcomes.
Removal of rationale for changes from the main plan.	The inclusion of the rationale for changes within the main plan caused necessary content to not be covered until the start of page 7 of the plan version 3.0 (listed page 12 in version 3.0 due to inclusion of administrative content pages in page numbering). Condensing the rationale to this table and inclusion as an annex has reduced placement of necessary content to page 3 of version 4.0. The inclusion of this table also meets the recommendations made by the ANO in the 2019 audit report.
Removal of publishing requirements and maintenance of this plan section with the addition of document control section.	Publishing (referred to as Document Control in version 4.0) is an administrative requirement and as such has been added to the administrative content pages of version 4.0.
Simplified and updated forecasts.	The forecasts in table one have been simplified to align with specified temporal restrictions.
On-Base Noise Impacts removed.	Section not required as specified in applicability section of version 4.0.
Communication Strategy simplified.	Simplified to be less specific on how communication it achieved.
Updated figures added to annex.	Updated figures have been included as annexes to support the content of the plan.

ANNEX D – RAAF BASE AMBERLEY MAP

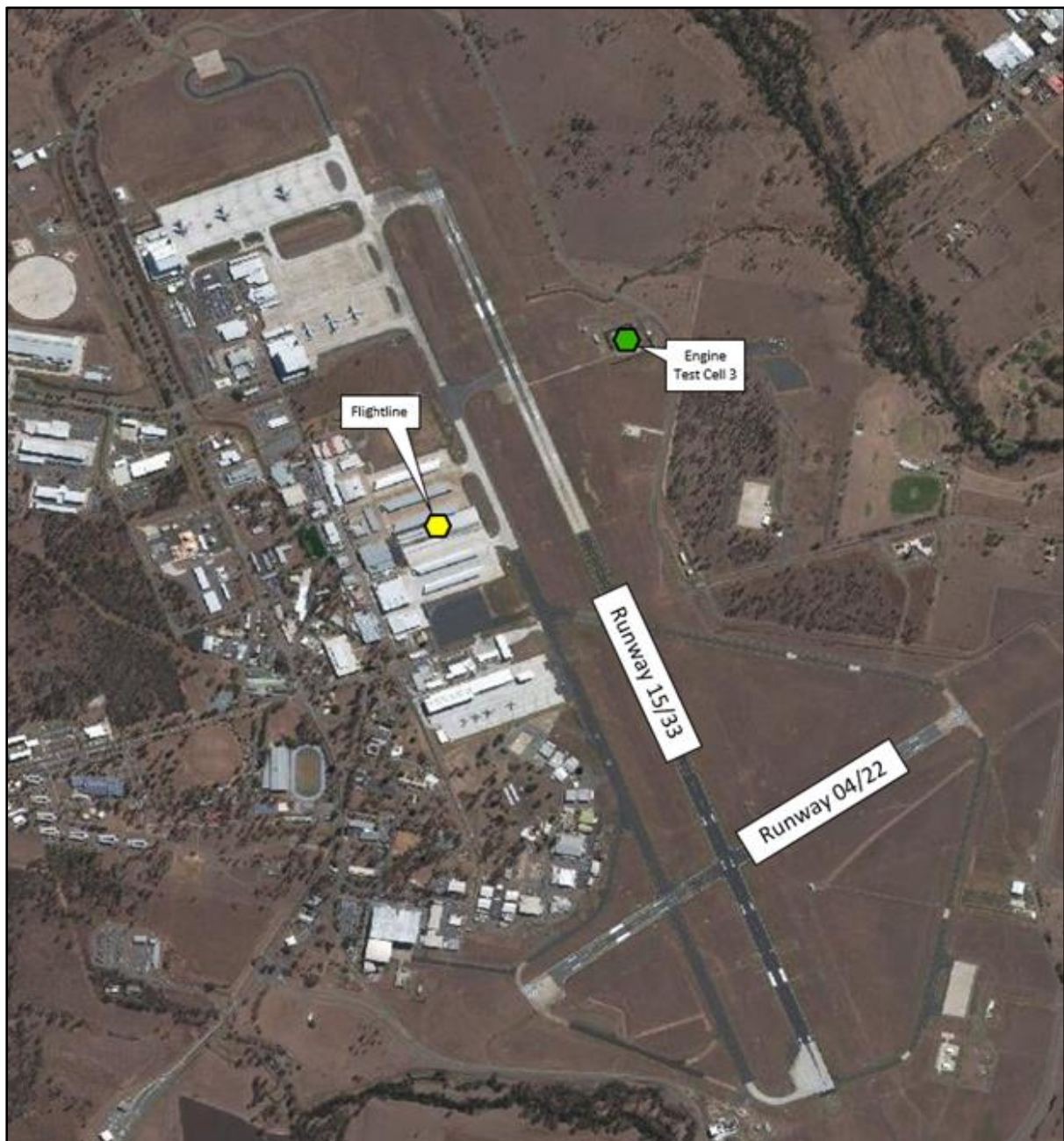


Figure D-One: Map of RAAF Amberley and Key Locations

ANNEX E – STANDARD DEPARTURES FROM RAAF AMBERLEY

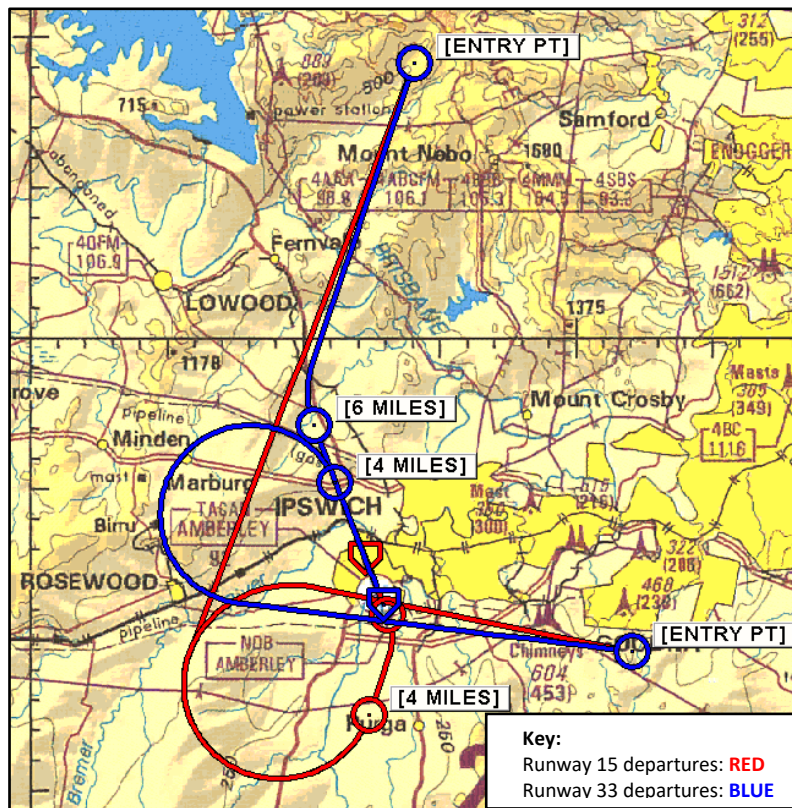


Figure E-One: Departures to the North East and Eastern Training Area

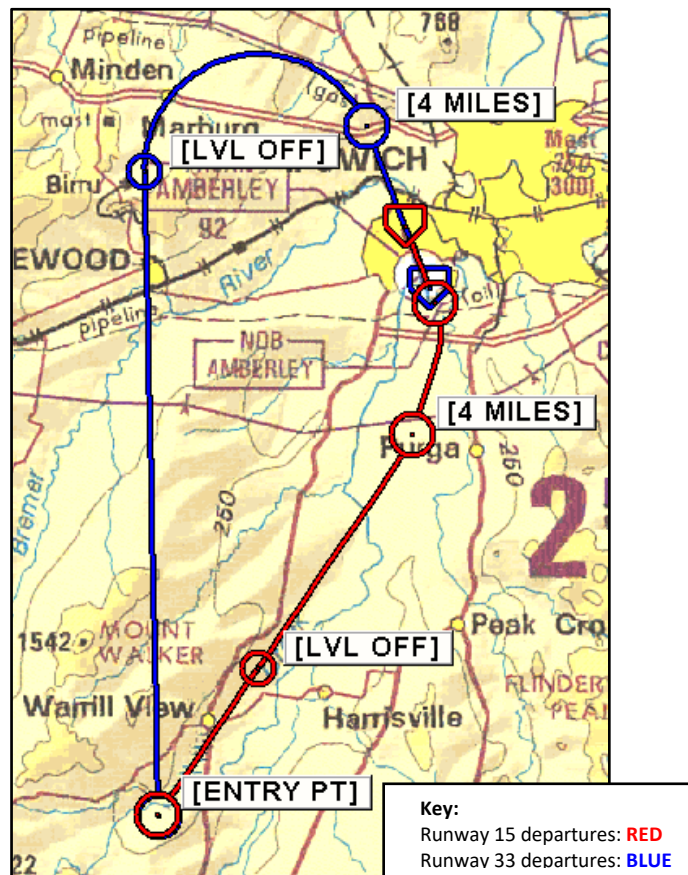


Figure E-Two: Departures to Southern Training Areas

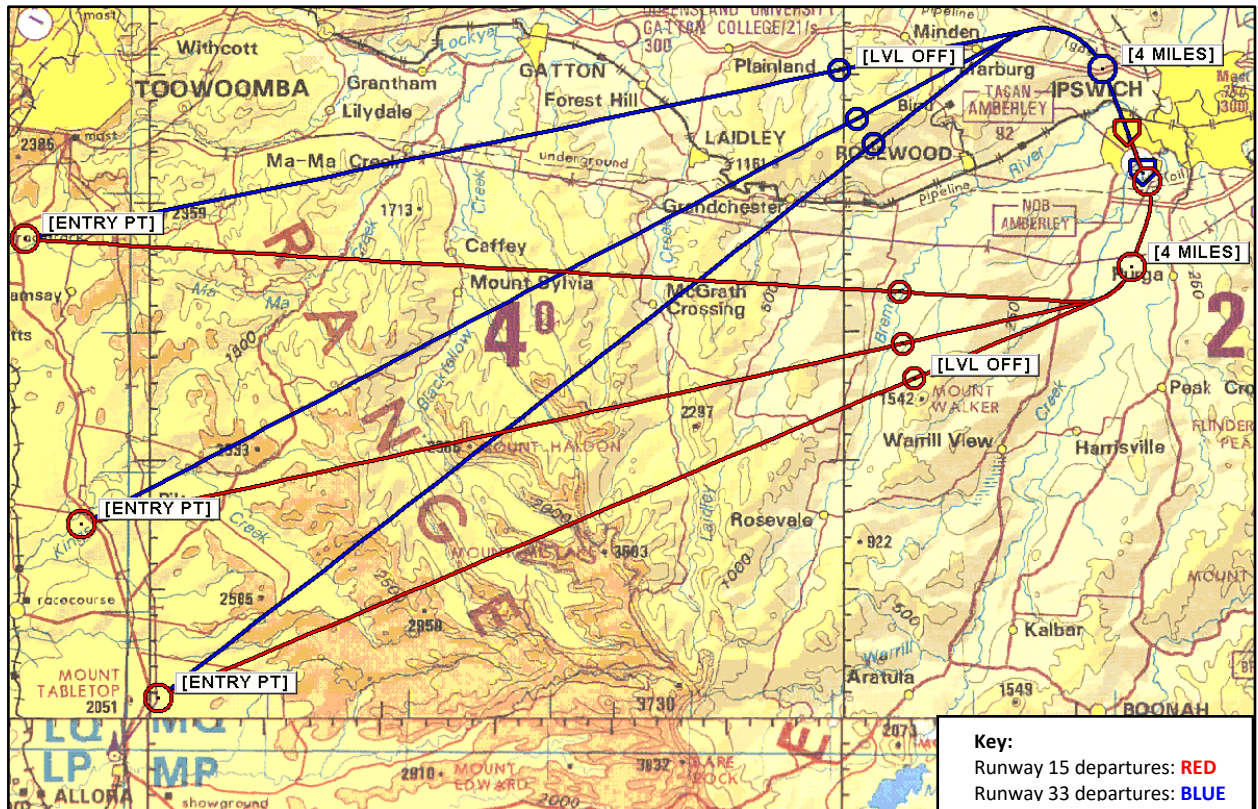


Figure E-Three: Departures to the Western Training Area

RUNWAY 15 ARRIVALS FOR INSTRUMENT APPROACH OR STRAIGHT-IN ARRIVAL

1. There are several Runway 15 instrument approach options available for F/A-18F & EA-18G at RAAF Amberley, all of which are available to all other aircraft types.
2. The approaches normally start above 10000 feet altitude and reach 3000 feet altitude approximately 10nm to the North West of the base, aligned with the runway. Aircraft may also deviate from these tracks when directed by Air Traffic Control for traffic separation purposes. The different flight paths depicted below reflect the ground track flown on each of the different approach options, however the final approach courses are common.
3. The colours in the figure below represent the following types of navigation guidance; Blue – ground based navigation aid, Red – Satellite based navigation aid and Green – Aircraft based navigation aid (Airborne Radar).
4. For the foreseeable future, there is expected to be an even distribution in the use of the depicted flight paths, meaning noise should not be concentrated in any one of these areas.
5. Instrument approaches using ground based navigation aids (blue) normally start on a radial and range from the RAAF Amberley navigation aid located on the airfield. The approach starts at 12 nautical miles from the navigation aid and arcs around until turning in to approach for landing. This approach normally starts above 10000 feet altitude and descends on the arc to reach ~4000 feet when turning in on final approach. The 12 nautical mile arc approach is a new flight path designed to reduce noise impact from the previous approach that was flown on a 9 nautical mile arc, which enables aircraft to remain higher and at lower power settings until established on the final approach radial.
6. Visual Straight-In arrivals will fly variable routes to join the final approach path.

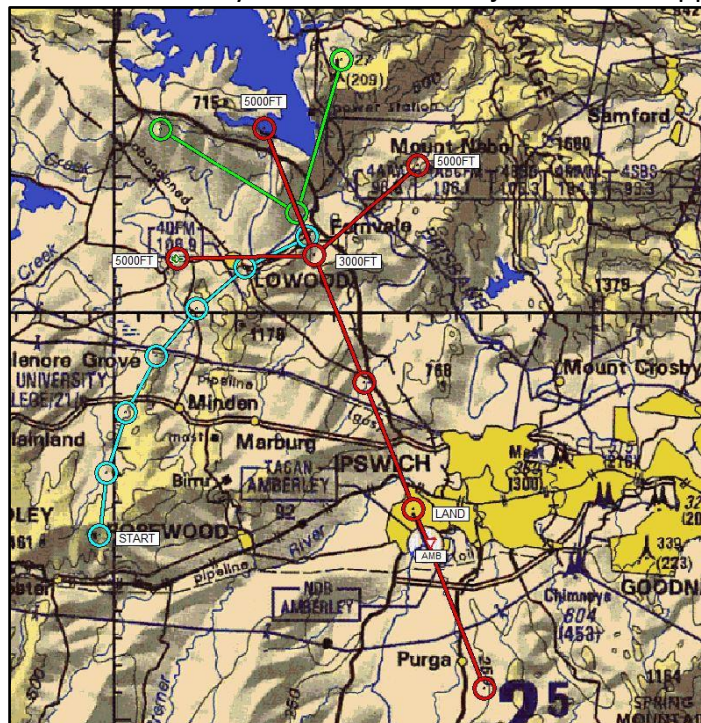


Figure F-Two: Runway 15 Instrument Approaches or Straight-In Arrivals

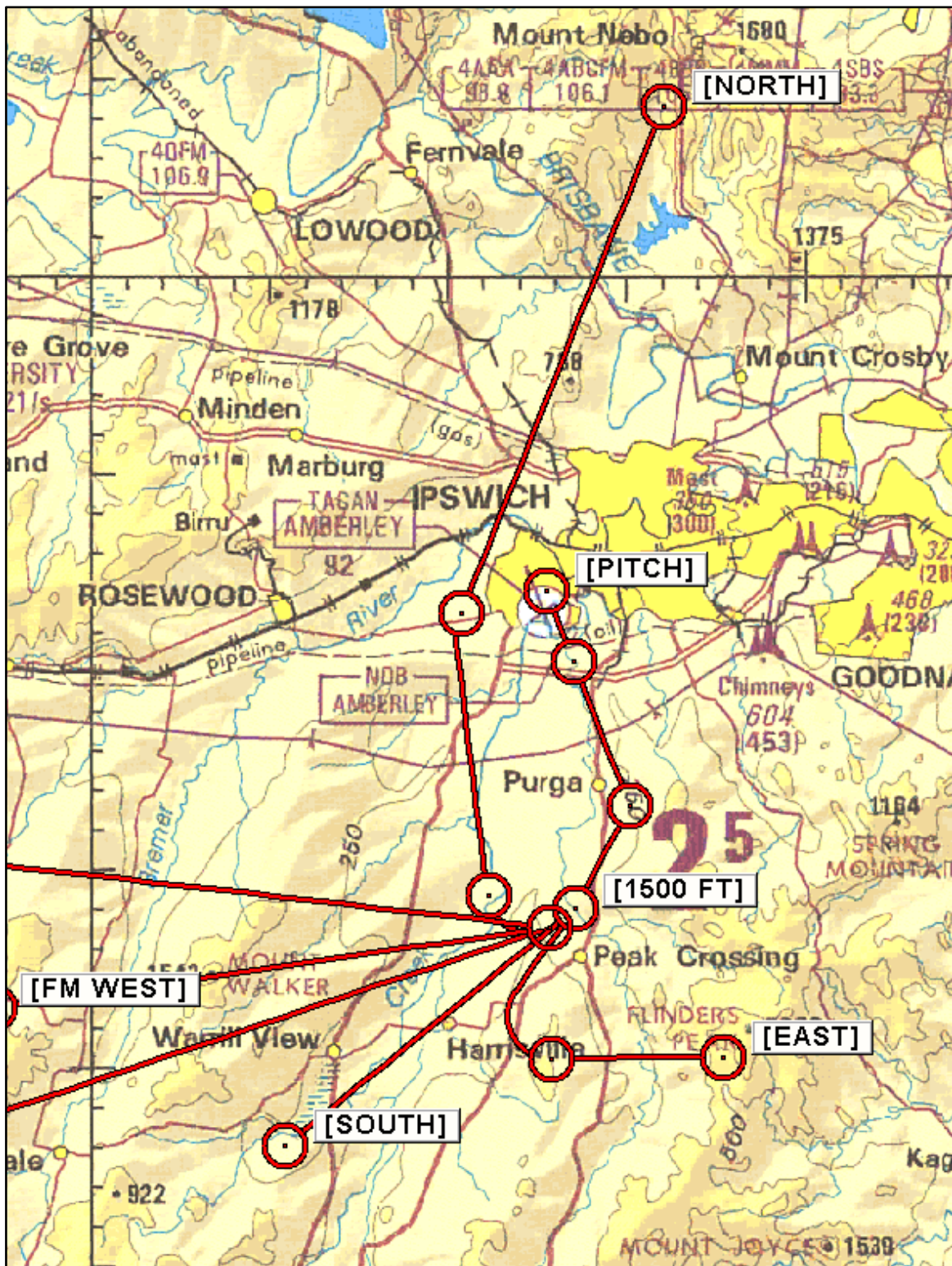


Figure F-Three: Runway 33 Arrivals for Initial and Pitch

RUNWAY 33 ARRIVALS FOR INSTRUMENT APPROACH OR STRAIGHT-IN ARRIVAL

1. There are several Runway 33 instrument approach options available for F/A-18F & EA-18G at RAAF Amberley, all of which are available to all other aircraft types.
2. The approaches normally start above 10000 feet altitude and reach 3000 feet altitude approximately 10nm to the South East of the base, aligned with the runway. Aircraft may also deviate from these tracks when directed by Air Traffic Control for traffic separation purposes. The different flight paths depicted below reflect the ground track flown on each of the different approach options, however the final approach courses are common.
3. The colours in the figure below represent the following types of navigation guidance; Blue – Ground based navigation aid, Red – Satellite based navigation aid and Green – Aircraft based navigation aid (Airborne Radar)
4. For the foreseeable future, there is expected to be an even distribution in the use of the depicted flight paths, meaning noise should not be concentrated in any one of these areas.
5. Instrument approaches using ground based navigation aids (blue) normally start on a radial and range from the RAAF Amberley navigation aid located on the airfield. The approach commences at 9 nautical miles from the navigation aid and arcs around until turning in to approach for landing. This approach normally starts above 5000 feet altitude and descends on the arc to reach ~3000 feet when turning in on final approach.
6. From a noise abatement perspective it would be preferable to fly an arc further away from the airfield (as per the changes to the runway 15 instrument approaches), however due to airspace constraints to the south east of RAAF Base Amberley it is not possible to increase the distance of the arc for this approach.
7. Visual Straight-In arrivals will fly variable routes to join the final approach path.

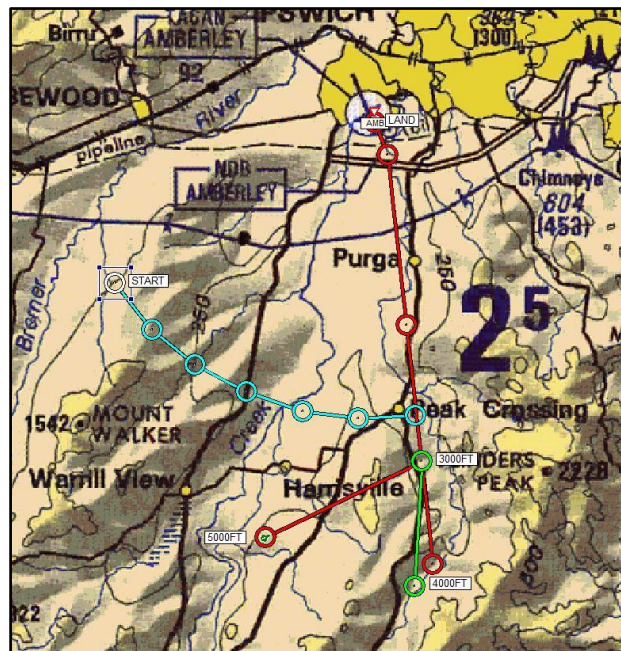


Figure F-Four: Runway 33 Instrument Approaches or Straight-In Arrivals

ANNEX G – INITIAL AND PITCH PROCEDURE

1. Initial and Pitch arrivals result in the arriving aircraft ‘pitching’ from over the runway to join the downwind leg parallel to the runway, to then turn onto a base leg for landing.
2. Aircraft recovering in formation will track towards the airfield in either a close formation, or with a separation of approximately 2000 feet, and then pitch individually onto downwind to generate sufficient separation on the parallel downwind leg to enable sequential landings. This is indicated by the ‘Pitch 1’ track representing a typical flight path for the lead aircraft, and ‘Pitch 2’ representing the following flight path for subsequent aircraft. Formations may recover in formations of up to 4 aircraft, with following formations closely spaced.
3. Depending on the number of aircraft in the landing pattern ahead, the actual pitch point may vary to enable formations to gain sufficient separation from the aircraft ahead.

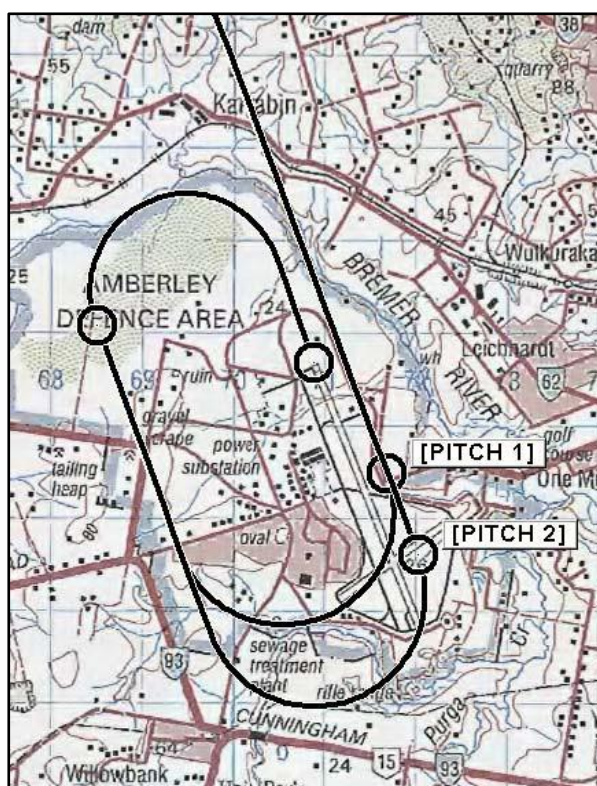


Figure G-One: Initial and Pitch Runway
15 (from the South)

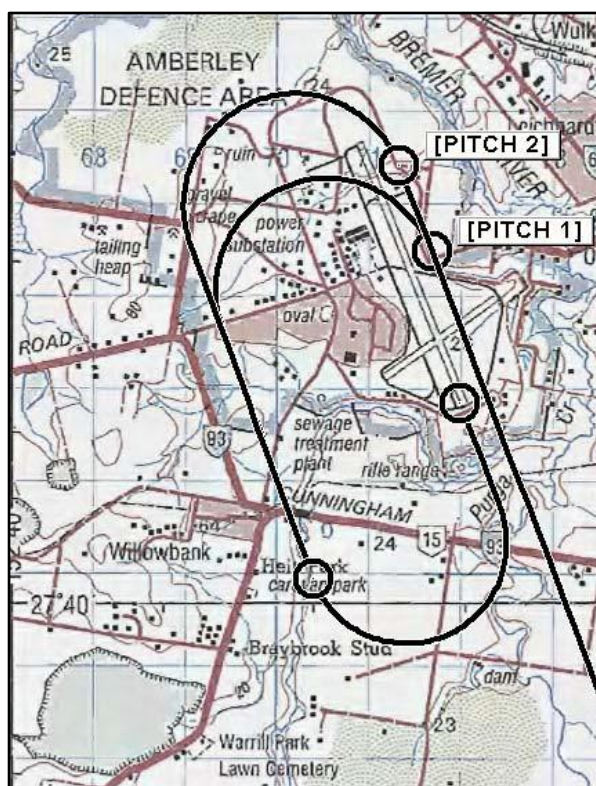


Figure G-Two: Initial and Pitch Runway
33 (from the South)

ANNEX H – CIRCUIT PATTERN

1. 62% of circuits are planned to operate on Runway 15, which is take-off to the south-east and landing from the north-west.
2. For noise abatement purposes, circuits are planned to be flown inside the town of Walloon to the north- west and inside Willowbank to the south-west.
3. Due to weather or for de-confliction with other traffic in the circuit, an extended circuit pattern may need to be flown on occasions; however aircraft will continue to avoid direct overflight of Walloon and Willowbank.

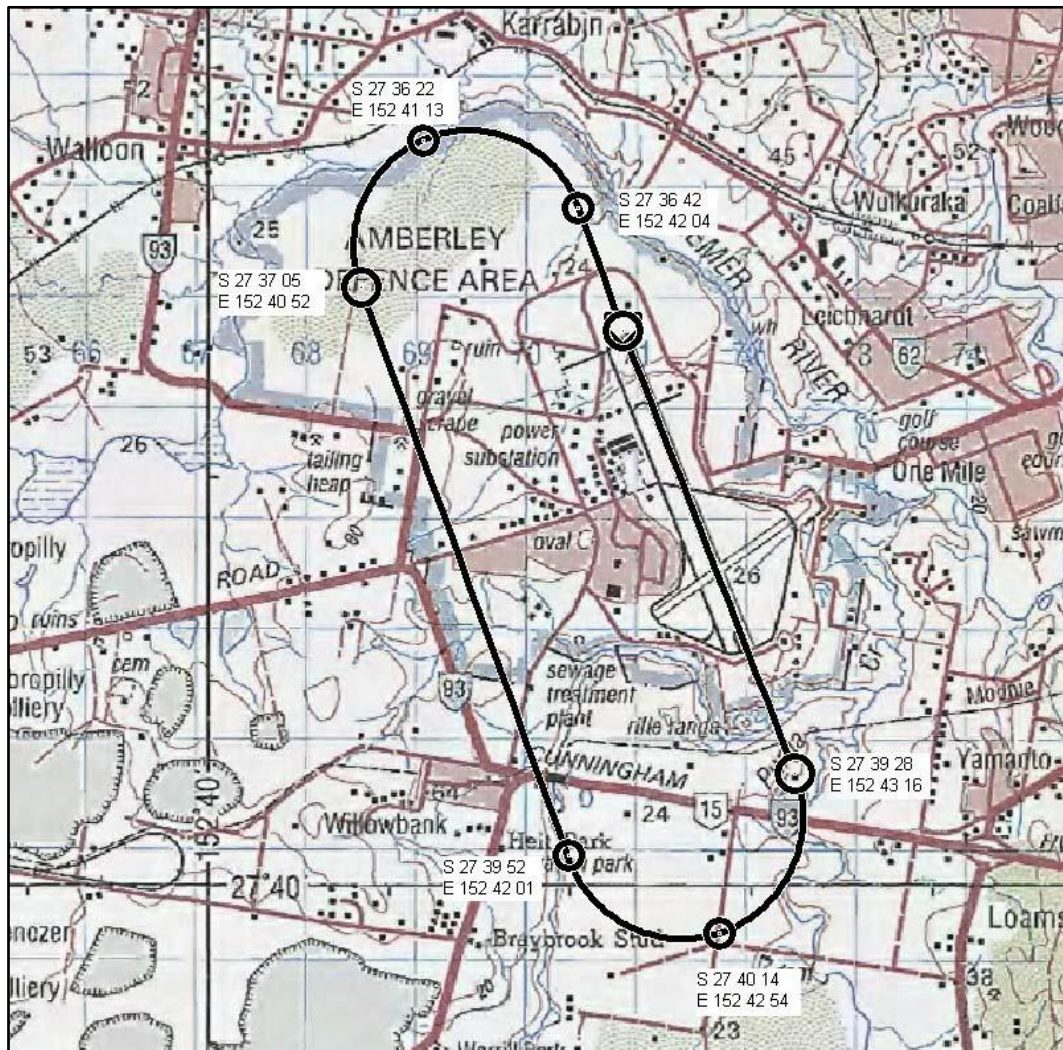


Figure H-One: Circuit Pattern Avoiding Walloon and Willowbank

ENCLOSURE ONE – AUSTRALIAN NOISE EXPOSURE FORECAST, RAAF AMBERLEY 2029

1. The following pages show the 2017 noise modelling outcomes for RAAF Base Amberley based on the projected total aircraft movements in 2029, which provides a long term planning horizon for land planning authorities. The modelling includes the F/A-18F and EA-18G movements and visiting military fast jet movements forecast in this plan, as well as other aircraft operating from RAAF Base Amberley such as the C-17 cargo aircraft and the KC-30 air to air refuelling aircraft.
2. **LMax Map.** The LMax map (Figure E-One) shows the variance of aircraft maximum noise levels that can be experienced at any particular location. As the map shows, maximum noise occurrences could range from once per year to many times per day. It is intended to demonstrate that noise may be heard at some distances from RAAF Base Amberley, even if only occasionally.
3. Review of the 2016 LMax map identified an excessive area of high noise results to the north-west of RAAF Base Amberley. To reduce this 'hot spot' one of the instrument approaches to runway 15 was modified by moving the approach ground track to the north-west further away from the base. The outcome of this is that aircraft will be able to remain higher above the ground on this new track, and more significantly will be able to delay configuring the aircraft for landing (landing gear down) until established on final approach, which removes the need for higher power settings to the north-west of the airfield. Additionally, the instrument approach to runway 33 was also modified by moving the start point further south to reduce noise impact to the west.
4. The current LMax map reflects the revised flight profiles.
5. **'Number Above' Maps.** Number Above maps show the number of times per day aircraft noise may reach a nominated decibel level, based on an average flying day. An average flying day is total annual aircraft movements averaged over 230 days, which equates to five flying days a week for 46 weeks per year. Maps are provided for:
 - a. 70 A-weighted decibels (dB(A)) (Figure E-Two),
 - b. 85 dB(A) (Figure E-Three), and
 - c. 100 dB(A) (Figure E-Four).
6. Of note, these maps include all aircraft types operating from RAAF Amberley, not just the F/A-18F and the EA-18G.
7. For comparison purposes the noise event data from the 2009 Public Environment Report is included, noting that these 2009 maps only included the F/A-18F movements. The comparison identifies that at the 70 decibel and 85 decibel levels there is a modest expansion of the footprint to the north and south-west which is predominately driven by the overall increase in annual movements resulting in a higher average day movement rate. However, the revised flight tracks and vertical profiles incorporated into the 2017 modelling show there is a reduction in average day noise events to the east over Ipswich and to the west of the base, despite the increase in planned movements. At the 100 decibel level, there is no overall increase in noise footprint despite the increase in planned annual movements.



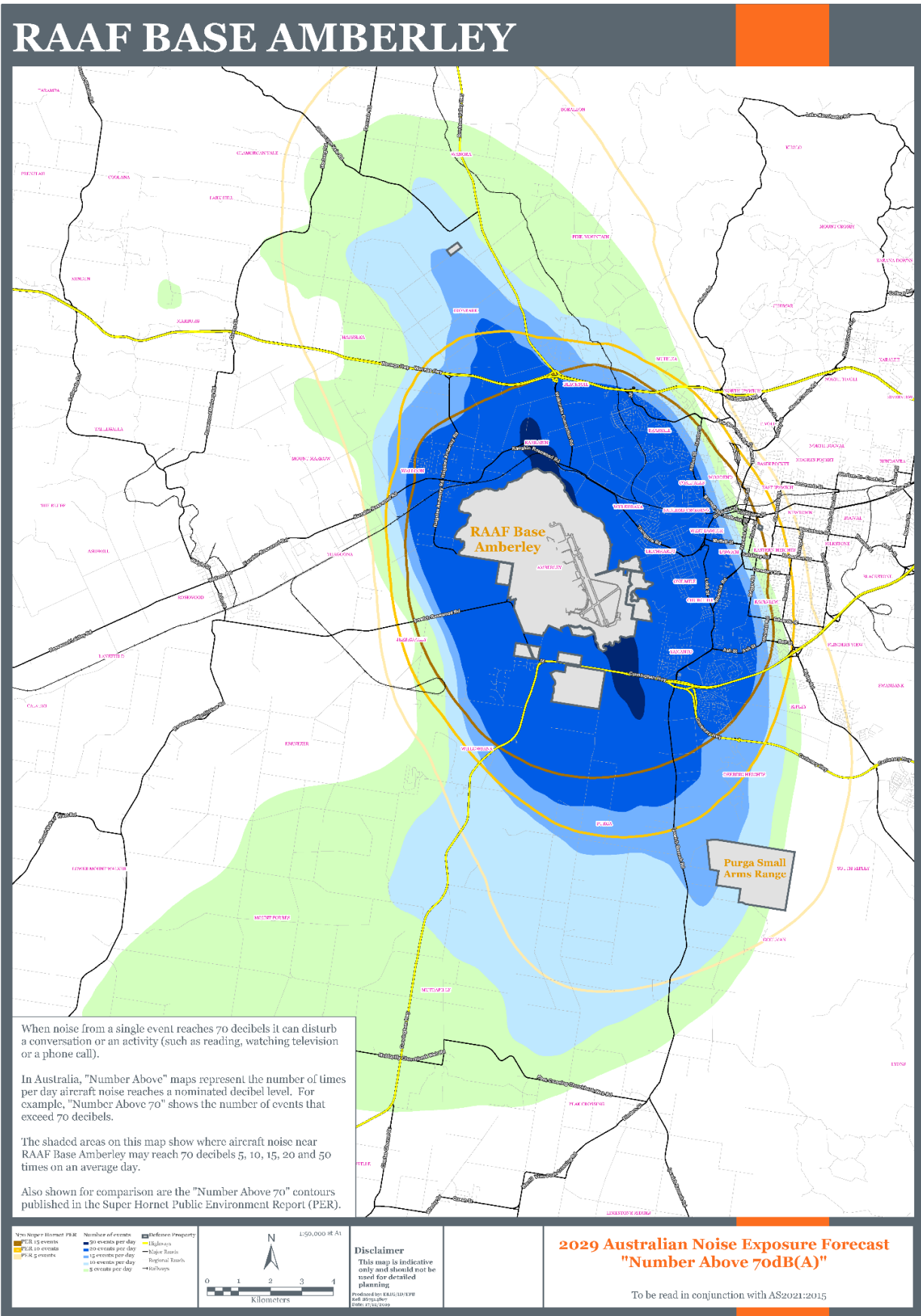


Figure E-Two: Number Above 70 dB(A) Map, RAAF Amberley, 2029 ANEF

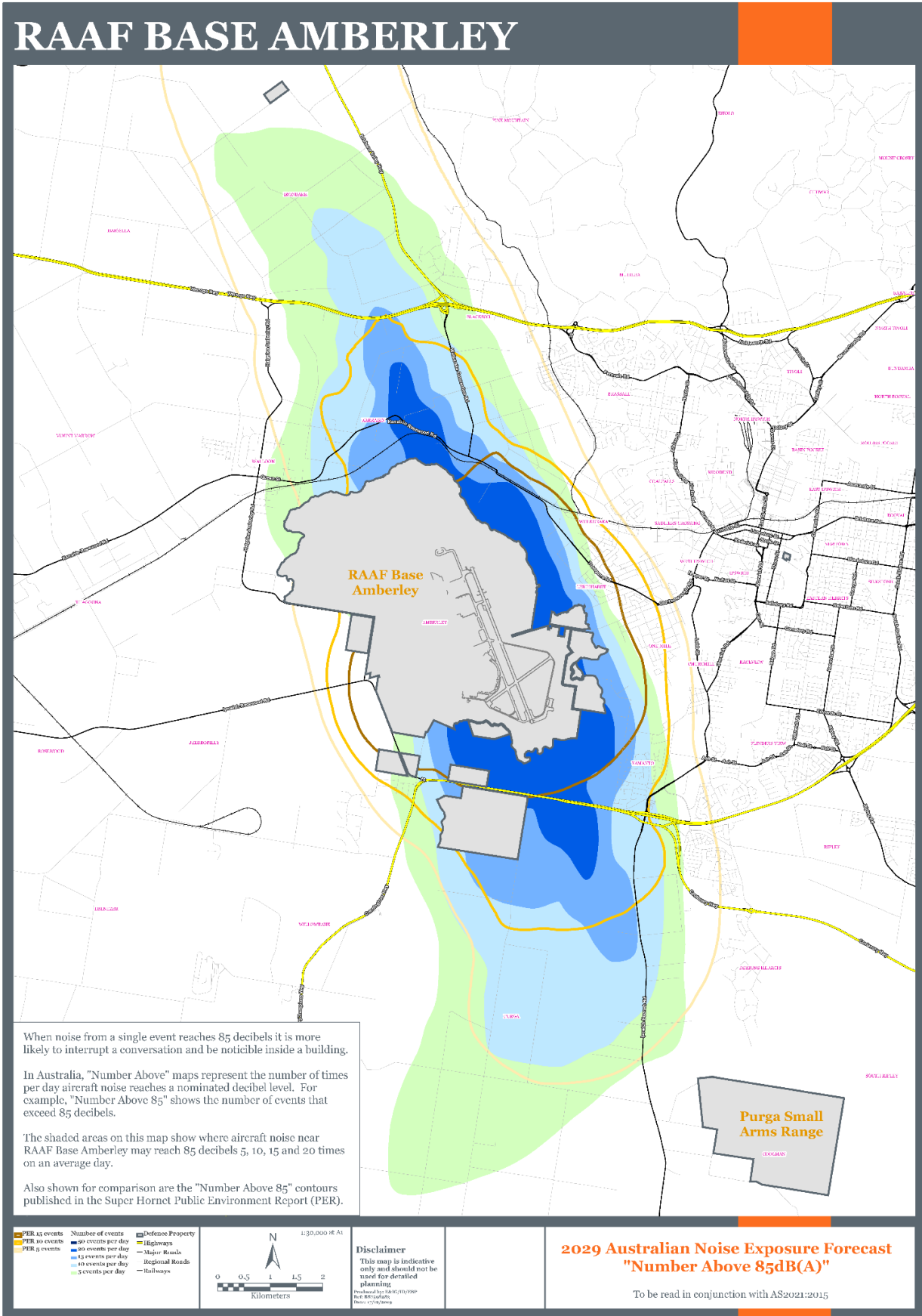


Figure E-Three: Number Above 85 dB(A) Map, RAAF Amberley, 2029 ANEF

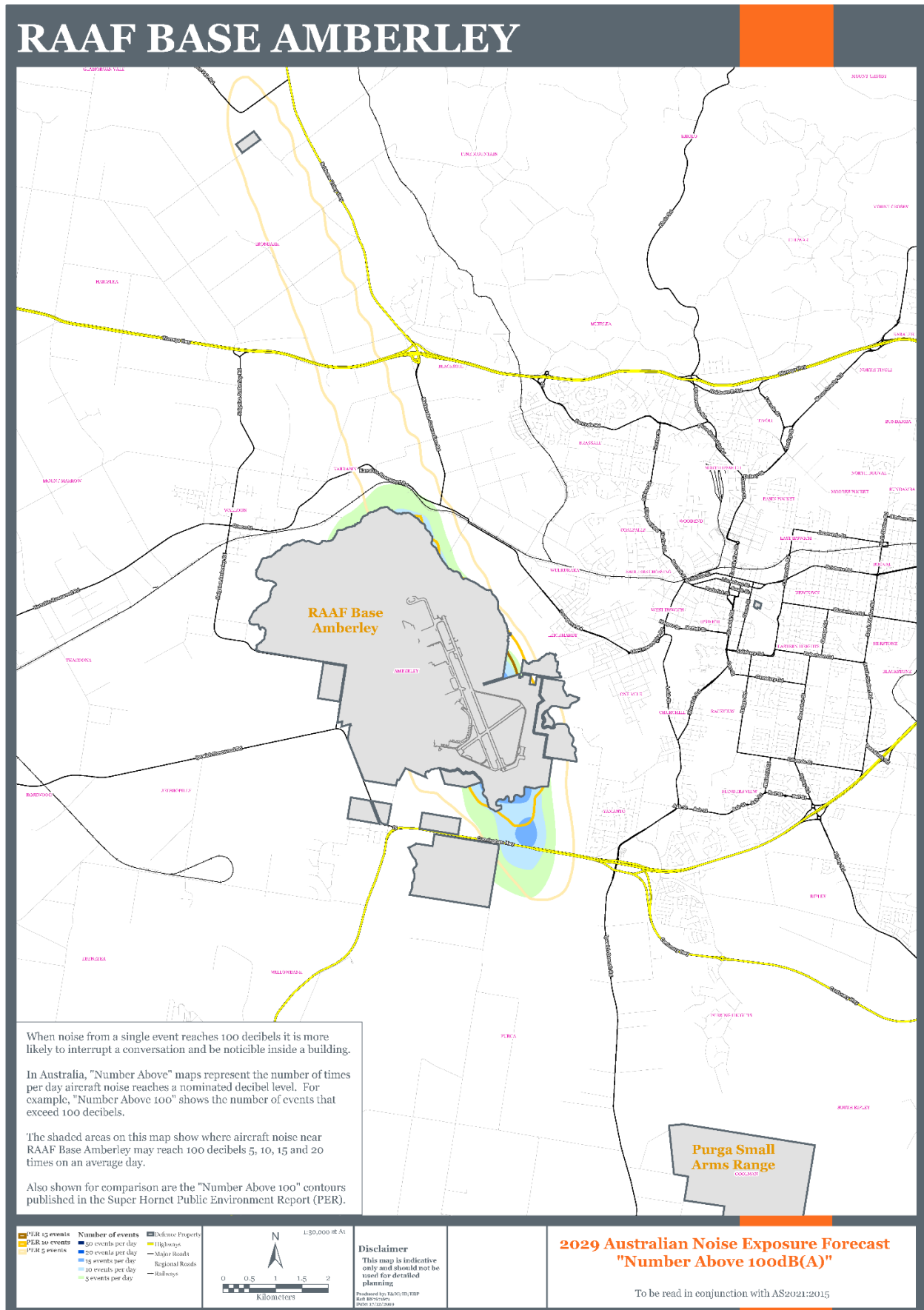


Figure E-Four: Number Above 100 dB(A) Map, RAAF Amberley, 2029 ANEF