AVIATION PROJECTS

September 2024

Jeanette Sullivan
Group Manager – Clean Energy Transition
Northern Star Resources Limited (NSRL)
Level 4, 500 Hay Street Subiaco WA 6008

By email: jsullivan@nsrltd.com

Our reference: 105601-02

Dear Jeanette

Re: East Kalgoorlie Wind Farm – Update Preliminary Aviation Impact Assessment

Reference is invited to your request for an updated Preliminary Aviation Impact Assessment of the proposed East Kalgoorlie Wind Farm.

Please find an assessment of possible development constraints due to aviation impacts in this correspondence. This analysis is based on the information in your email correspondence.

1.1. Project background

The proposed East Kalgoorlie Wind Farm Project (the Project) is located approximately 10 km northeast of the City of Kalgoorlie Boulder and 12.7 km northeast of the aerodrome reference point of Kalgoorlie-Boulder airport (YPKG). The project is anticipated to comprise the development of 36 wind turbine generators (WTGs) with a maximum tip height of 260 m above ground level (AGL) and one installed wind monitoring tower (WMT), which is 548.85 m Australian Height Datum (AHD).

Northern Star Resources Limited (NSRL) has requested Aviation Projects prepare an updated Preliminary Aviation Assessment for the new model of WTG to assess the likely impacts of the Project's development in the proposed location on aviation operations.

1.2. References

References used or consulted in the preparation of this report included:

- Airservices Australia
    - Aeronautical Information Package; effective 05 September 2024
    - Designated Airspace Handbook and Aeronautical Charts, effective 13 June 2024.
- Civil Aviation Safety Authority (CASA)
    - Advisory Circular (AC) 91-02 V1.2, *Guidelines for aeroplanes with MTOW not exceeding 5700 kg – suitable places to take off and land*, dated November 2022
    - AC 91-10 v1.1: *Operations in the vicinity of non-controlled aerodromes*, dated November 2021
    - AC 139.E-01 v1.0—*Reporting of Tall Structures*, dated December 2021

  - AC 139.E-05 v1.1 Obstacles (including wind farms) outside the vicinity of a CASA certified aerodrome (October 2022)
  - CASR Part 173 MOS– *Standards Applicable to Instrument Flight Procedure Design*, version 1.8, dated August 2022
  - CASR Part 139 MOS– *Aerodromes*, F2024C00161 registered 16/02/2024
  - *Civil Aviation Regulations 1998 (CAR).*
  - *Civil Aviation Safety Regulations 1998* (CASR).
- City Kalgoorlie-Boulder, Local Planning Scheme No 2, 2023
- Department of Infrastructure, Transport, Regional Development, Communications and Arts, Australian Government, National Airport Safeguarding Framework, Guideline D *Managing the Risk to aviation safety of wind turbine installations (wind farms)/Wind Monitoring Towers*, dated July 2012
- Kalgoorlie-Boulder Airport Master Plan 2018-2032, by Aurecon Australasia in partnership with the City of Kalgoorlie-Boulder
- International Civil Aviation Organization (ICAO),
  - Annex 14—*Aerodromes*
  - *Doc 8168 Procedures for Air Navigation Services—Aircraft Operations (PANS-OPS)*
- OzRunways, dated September 2024
- Western Australia Government, Department of Planning, Lands and Heritage, *Position Statement: Renewable energy facilities, March 2020*
- Other references as noted.

1.3. Site Overview

The Project Area is located approximately 10 km northeast of the City of Kalgoorlie Boulder and 12.7 km northeast of the aerodrome reference point of Kalgoorlie-Boulder airport (YPKG). The Project is wholly located within the local government area (LGA) of the City of Kalgoorlie-Boulder.

Figure 1 Shows an indicative location of the Project Area relative to YPKG, including the installed WMT location (source: NSRL, Google Earth).

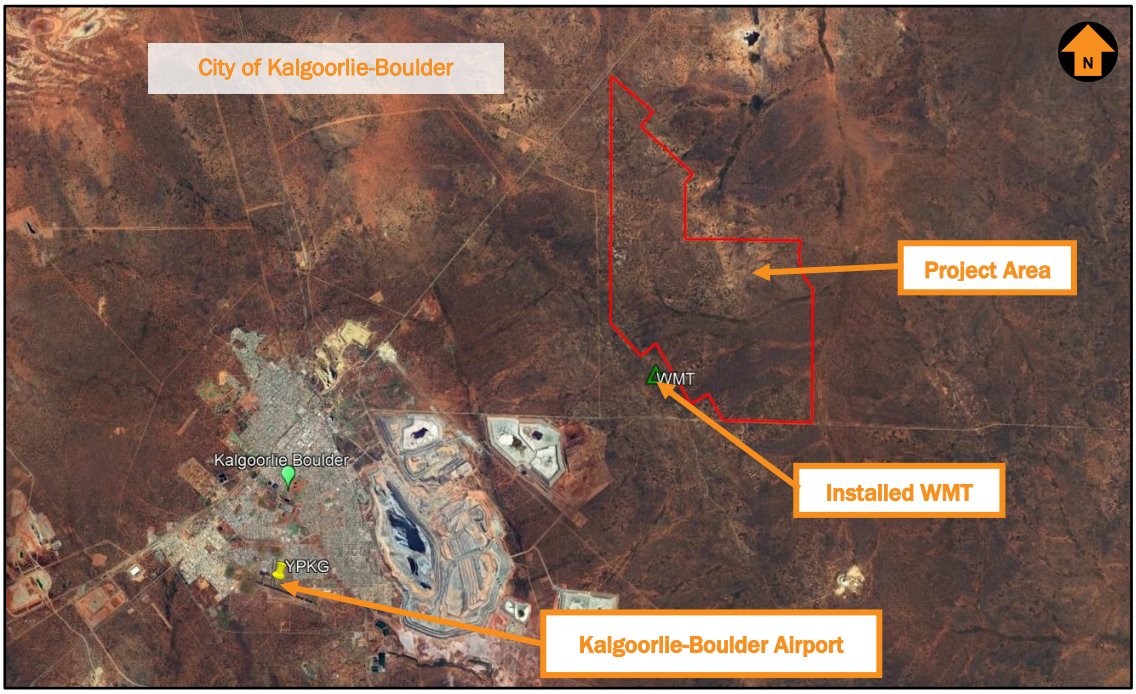


Figure 1 Project area overview.

1.4. Project description

The wind turbine generators are proposed to have a maximum blade tip height of up to 260 m AGL.

The highest terrain elevation for the proposed Project Area is observed as 426 m in Google Earth. A 5 m buffer is applied to this analysis which results in a nominal maximum overall Project height of 691 m AHD (2267 ft above mean sea level (AMSL)).

A wind monitoring tower with a maximum height of 548.85 m AHD is installed in the project area. An overhead transmission line (OHTL) with a maximum height of 50 m is proposed to be installed.

The maximum project height applied in this analysis is summarised in Table 1.

Table 1 Project description

Object	*Preliminary Site elevation (buffer applied)*	*Height m AGL*	*Maximum height m AHD*	*Maximum Height ft AMSL*
Wind Turbine Generator	431 m AHD	260	691	2267
Wind Monitoring Tower	N/A	N/A	548.85	1800.7

The WMT is already installed, and the maximum height of the OHTL at 50 m AGL will not have an impact on applicable obstacle protection surfaces. Both are not considered further in this assessment.

1.5. Western Australia Government, Department of Planning, Lands and Heritage

The Western Australian Planning Commission administers responsibility for approving renewable energy facilities through local councils. The Department of Planning, Lands and Heritage has published *Position Statement: Renewable energy facilities* (March 2020) on behalf the Western Australia Planning Commission. These guidelines provide advice to inform planning decisions about a wind energy facility proposal.

The intent of this position statement is to:

- outline the Western Australian Planning Commission (WAPC) requirements to support the consistent consideration and provision of renewable energy facilities within Western Australia
- identify assessment measures to facilitate appropriate development of renewable energy facilities.

The position statement applies to the preparation and assessment of planning instruments including regional and local planning schemes and strategies.

The position statement supersedes Planning Bulletin 67 Guidelines for Wind Farm Development (2004).

Section 5.3.1 *Community Consultation* and Section 5.3.5 *Public and Aviation safety* are relevant to this assessment and are extracted below:

> ***Section 5.3.1 Community Consultation***
>
> *Early consultation with the community and stakeholders by the proponents is encouraged to ensure that the proposal is compatible with existing land uses on and near the site. The local government should be consulted with respect to the community consultation program. Relevant stakeholders may include:*
>
> - *Air Services Australia*
> - *Australian Wind Alliance*
> - *Civil Aviation Safety Authority*
>
> ***5.3.5 Public and aviation safety***
>
> *Proponents of wind turbine proposals should refer to the National Airports Safeguarding Framework (NASF) Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installation (Wind Farms) / Wind Monitoring Towers to determine any potential aviation safety risks and possible mitigation measures.*
>
> *Any potential aviation safety risks identified require consultation with Civil Aviation Safety Authority (CASA), Air Services Australia and/or the Commonwealth Department of Defence.*

The position paper defines Renewable energy facility as premises used to generate energy from a renewable energy source and includes any building or other structure used in, or relating to, the generation of energy by a renewable resource. It does not include renewable energy electricity generation where the energy produced principally supplies a domestic and/or business premises and any on selling to the grid is secondary.

An aviation impact assessment would include consultation with relevant aviation stakeholders and address aviation-related matters included in the Position Statement.

1.6. City of Kalgoorlie-Boulder Local Planning Scheme No 2, 2023

The City of Kalgoorlie-Boulder published the Local Planning Scheme No 2, 2023, which includes guidelines and performance outcomes for the Use Code to ensure new developments do not create incompatible intrusions or compromise the safety of existing airports and associated navigation facilities.

General requirements of the planning scheme are provided in Table 2.

Table 2 City of Kalgoorlie-Boulder Local Planning Scheme No 2, 2023

Special control areas in the Scheme area			
Name of Area	*Purpose*	*Objectives*	*Additional Provisions*
SCA2 Height Restrictions	To control height of structures to protect operations of Kalgoorlie-Boulder airport	• To regulate development located within the Obstacle Limitation Surfaces (OLS) areas • To control the type of vegetation and height of structures being constructed within areas that are subject to airport height restrictions • To ensure that development is in accordance with, and does not compromise, the objectives of the Airport Master Plan.	1. Planning approval is required for all development wholly or partly within SCA2 including the construction, extension or alteration of any building; and (a) Development application plans are to state the ultimate heights of buildings/structures in Australian Height Datum (AHD). (b) Excludes all single and grouped dwellings and associated structures. c) The local government may refer planning applications to State and/or Federal regulatory agencies and airport operator and must have due regard to advice received when determining applications. 2. Any object outside of the Obstacle Limitation Surface (OLS) that extends above a height of 110m above site ground level must be assessed by the Civil Aviation Safety Authority (CASA) to determine whether development is an obstacle to aircraft

Special control areas in the Scheme area			
Name of Area	*Purpose*	*Objectives*	*Additional Provisions*
			operations; and any object outside of the OLS that extends above a height of 150m above site ground level is to be regarded as an obstacle unless assessed by CASA to be otherwise.

1.7. Kalgoorlie-Boulder Airport Master Plan 2018-2032

The Kalgoorlie-Boulder Airport Master Plan 2018-2032 was prepared by Aurecon Australasia in partnership with the City of Kalgoorlie-Boulder and provides a planning framework for future development to enable long-term operational objectives to be met.

The objectives of the Master Plan included:

- *Developing an airport plan with a layout that yields optimum airport capacity within available land to meet future demand and international aviation operating standards;*
- *Address delay and processing times associated with different facilities and components in the Master Plan that impact capacity; and*
- *Safeguard land use across the airport precinct and develop options to best utilise the land.*

Passenger movement forecasts were included in the Master Plan, which projected a range between 260,000 and 438,000 annual passenger movements by 2034.

An Airfield Development Plan was included in the Master Plan, with the key feature of the plan *to maximise the existing airfield capacity through operational optimisation before investing in significant capital investment.*

The Master Plan identified that no additional runway is required as part of this Master Plan. A number of options were listed as available to facilitate an extension of Runway 11/29, including to the east by 1000 m and to the west by up to 500 m. The Master Plan specified that to *facilitate Boeing 787 and equivalent sized aircraft, an extension to Runway 11/29 by 200 meters is sufficient.*

The Master Plan also identified that *Council is supportive of transferring the Boulder Golf Course land to the airport for airport development, including the potential commercial development of land not required for airfield purposes.*

A potential eastern extension of runway 11/29 by 1,000 m should not be constrained by the Project location, other than the impacts identified in this assessment applicable to the existing runway configuration.

1.8. Aircraft operations at non-controlled aerodromes

There are several uncontrolled aerodromes in the vicinity of the Project Area. Advisory Circular provides advice and guidance from CASA to illustrate a means, but not necessarily the only means, of complying with the regulations or to explain certain regulatory requirements. AC 91-10 v1.1 *Operations in the vicinity of non-controlled aerodromes* provides guidance for pilots flying at or in the vicinity of non-controlled aerodromes, with respect to CASR Part 91

1.9. Civil Aviation Safety Authority

CASA provides the following guidance to inform pilots of their obligations at non-certified aerodromes.

1.9.1. AC 91-02 V1.2, Guidelines for aeroplanes with MTOW not exceeding 5700 kg – suitable places to take off and land, dated November 2022

This Advisory Circular provides guidance for pilots of:

- Aeroplanes with maximum take-off weight (MTOW) not exceeding 5700 kg that are operated under Part 91 of CASR, including experimental aircraft, and
- Light sport aircraft (LSA) under Part 103 of CASR.

Purpose

This AC provides guidance to assist aeroplane pilots when determining the suitability of a place to safely take off and land. It provides an overview of pilot responsibilities, discusses the relevant circumstances recommended to be considered and includes general information and advice to enhance the safety of taking off and landing at any place.

2 Introduction

2.2 Use of Aerodromes

2.2.1 Regulation 91.410 authorises a place for use as an aerodrome if: (i) it is suitable for the landing and taking-off of aircraft; and (ii) an aircraft can land at or take off from the place safely, having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions).

4.2.4 The examples below are two of many possible considerations:

- the obstacles surrounding the aerodrome have been accurately described and are still current (e.g. have the trees on final grown taller since last reported), and

– the information provided enables the pilot to judge whether or not a landing approach can be made from both runway directions.

1.9.2. AC 91-10 v1.1, Operations in the vicinity of non-controlled aerodromes, dated November 2021

This AC provides guidance on procedures that, when followed, will improve situational awareness and safety for all pilots when flying at, or in the vicinity of, non-controlled aerodromes.

7.2 Traffic circuit direction

7.2.1 The standard aerodrome traffic circuit facilitates the orderly flow. Unless an alternative requirement for an aerodrome is stated in the ERSA or NOTAMs, all turns must be made to the left (regulation 91.385).

7.2.2 When arriving at an aerodrome to land, the pilot will normally join the circuit on upwind, crosswind (midfield), or at or before mid-downwind. Landings and take-offs should be made on the active runway or the runway most closely aligned into wind.

7.4.2 During initial climb-out, the turn onto crosswind should be appropriate to the performance of the aircraft but, in any case, not less than 500 ft above terrain so as to be at circuit height when turning downwind (regulation 91.390). Pilots may vary the size of the circuit depending on:

– the performance of the aircraft

– *AFM/Pilot's Operating Handbook requirements*

– *company standard operating procedures*

– *other safety reasons.*

7.7 Final approach

7.7.1 The turn onto final approach should be:

– *completed by a distance and height that is common to all operations at the aerodrome*

– *commensurate with the speed flown in the circuit for all aircraft of the same type.*

Illustrations of the standard aerodrome traffic circuit procedures provided in AC 91-10 v1.1. are shown in Figure 2 and Figure 3.

AC 91-10 v1.1. paragraph 7.10 refers to a distance that is "normally" well outside the circuit area and where no traffic conflict exists, which is at least 3 nm. The paragraph is copied below:

7.10 Departing the circuit area

7.10.1 Aircraft should depart the aerodrome circuit area by extending one of the standard circuit legs or climbing to depart overhead. However, the aircraft should not execute a turn to fly against the circuit direction unless the aircraft is well outside the circuit area and no traffic conflict exists. This will normally be at least 3 NM from the departure end of the runway but may be less for aircraft with high climb performance. In all cases, the distance should be based on the pilot's awareness of traffic and the ability of the aircraft to climb above and clear of the circuit area.

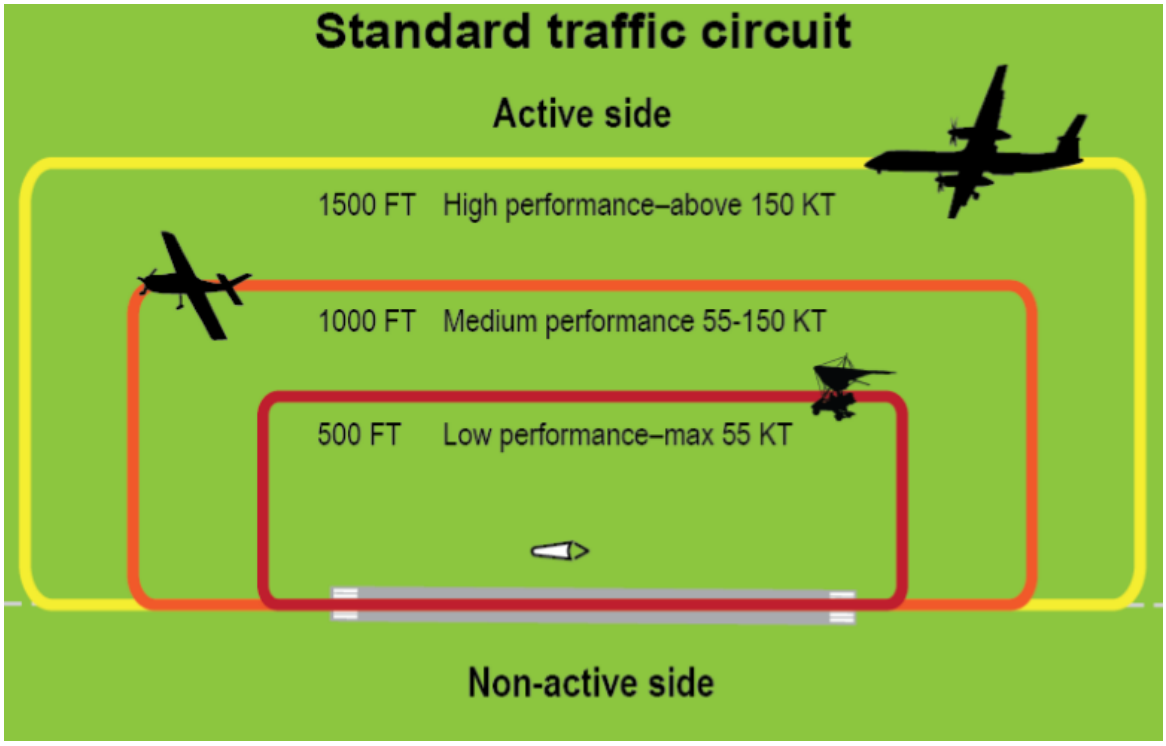


Figure 2 Lateral and vertical separation in the standard aerodrome traffic circuit

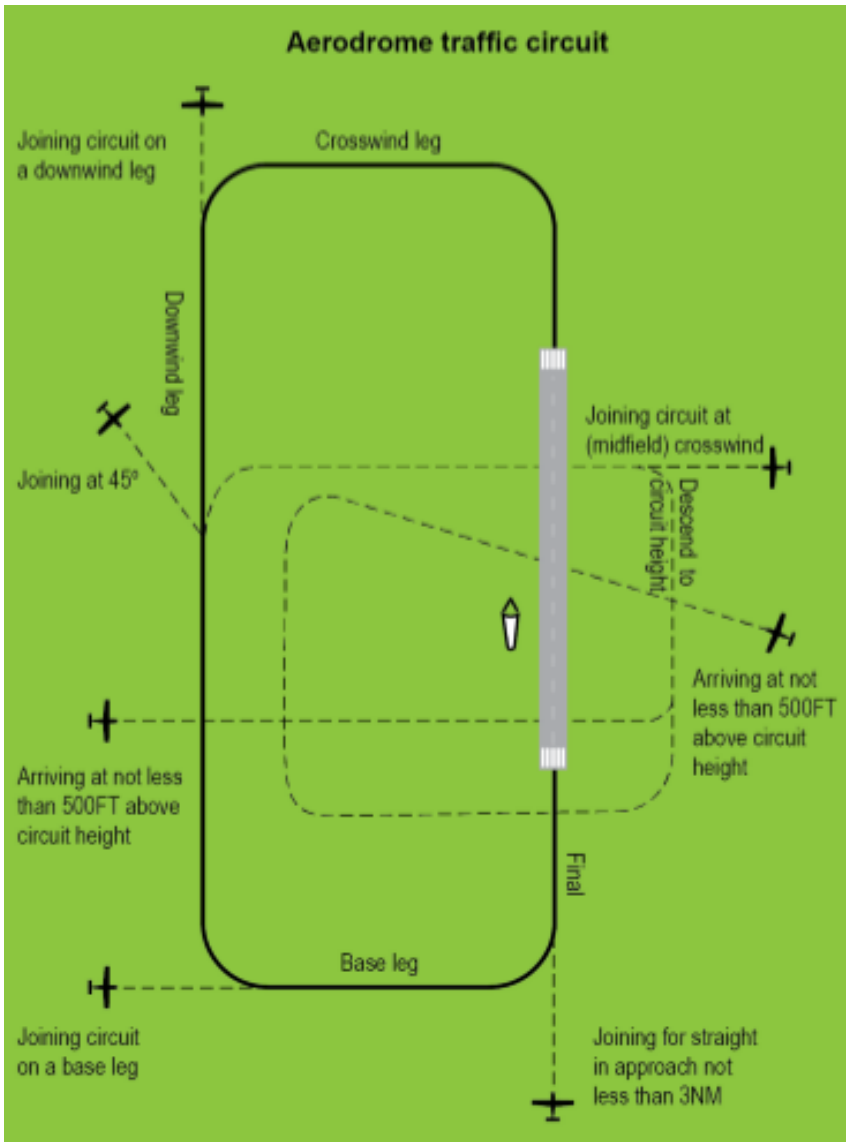


Figure 3 Aerodrome standard traffic circuit, showing arrival and joining procedures.

1.10. Rules of flight

1.10.1. Flight under Day Visual Flight Rules (VFR)

According to Australia's Aeronautical Information Package (AIP) the meteorological conditions required for visual flight in the applicable (class G) airspace at or below 3,000 ft AMSL or 1,000 ft AGL (whichever is the higher) are: 5,000 m visibility, clear of clouds and in sight of ground or water.

CASR 91.267 (Minimum height rules—other areas) prescribes the minimum height for flight. Generally speaking, and unless otherwise approved, aircraft are restricted to a minimum height of 500 ft AGL above the highest point of the terrain and any object on it within a radius of 300 m in visual flight during the day when not in the vicinity of built-up areas, and 1000 ft AGL over built up areas (within a horizontal radius of 600 m of the point on the ground or water immediately below the aeroplane).

These height restrictions do not apply if through stress of weather or any other unavoidable cause it is essential that a lower flying height be maintained.

Flight below these height restrictions is also permitted in certain other circumstances.

1.10.2. Flight under Night Visual Flight Rules (Night VFR)

With respect to flight under the VFR at night CASR 91.277 requires that the pilot in command of an aircraft flying VFR at night must not fly below the appropriate lowest safe altitude (unless during take-off and landing operations, within 3 nm of an aerodrome).

1.10.3. Flight under Instrument Flight Rules (Day or Night) (IFR)

According to CASR 91, flight under the IFR requires an aircraft to be operated at a height clear of obstacles that is calculated according to an approved method.

Obstacle lights on structures not within the vicinity of an aerodrome are effectively redundant to an aircraft being operated under the IFR.

1.11. Aircraft operator characteristics

Flying training may be conducted under either the IFR or VFR. Other general aviation operations under either IFR or VFR are also likely to be conducted at various aerodromes in the area.

Flight under day VFR is conducted above 500 ft above the highest point of the terrain within a 300 m radius unless the operation is approved to operate below 500 ft above the highest point of the terrain.

It is expected that the proposed WTGs will be sufficiently visually conspicuous to pilots conducting VFR operations within the vicinity of the Project Area to enable appropriate obstacle avoidance manoeuvring.

1.12. Obstacle lighting

The Civil Aviation Safety Authority will most likely recommend obstacle lighting on some of the turbines because the overall turbine height is proposed to substantially exceed 150 m AGL. Further information on appropriate obstacle lighting is contained within National Airport Safeguarding Framework Guideline D *Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers*.

Assessment to determine the need for obstacle lighting should follow the methodology specified in *ISO 31000:2018 Risk Management – Guidelines.*

1.13. Nearby certified aerodromes

Kambalda Airport (YKBL) and Kalgoorlie-Boulder Airport (YPKG) are certified under CASR Part 139 and located within 30 nm of the proposed Project Area.

The location of the Project Area relative to Kambalda Airport (YKBL) and Kalgoorlie-Boulder Airport (YPKG) is shown in Figure 4 (Source: NSRL, Google Earth). The orange circle around the airport represents a distance of 30 nm from the airport's aerodrome reference point (ARP).

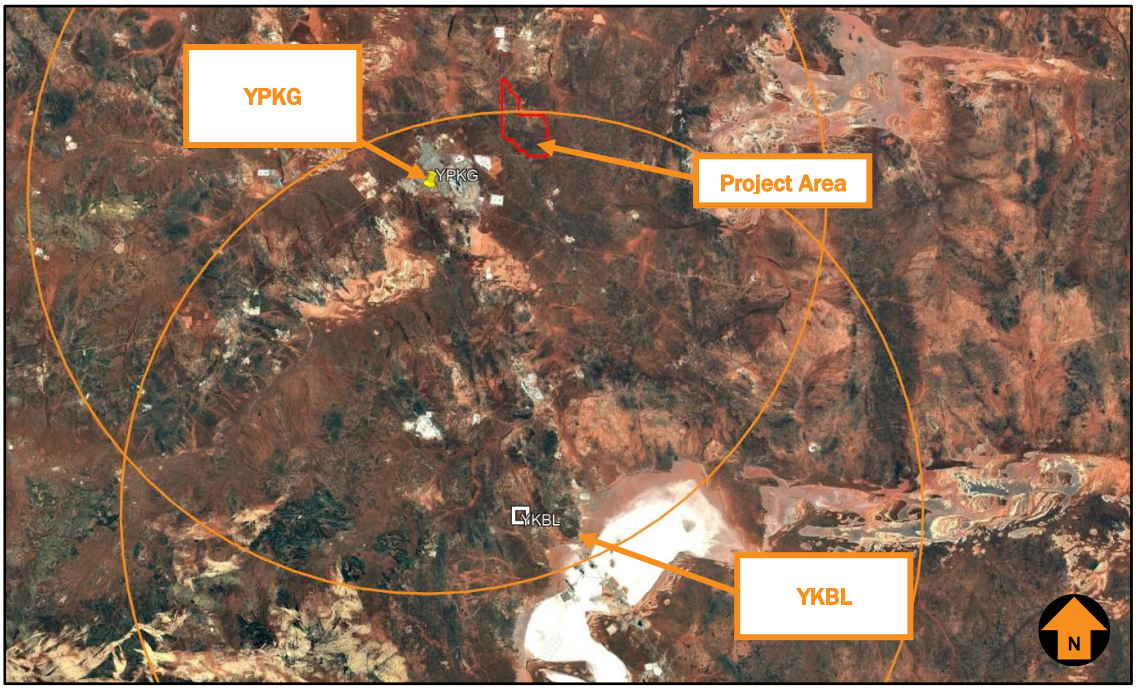


Figure 4 Location of Certified Airports in relation to the Project Area

1.14. Kambalda Airport (YKBL)

Kambalda Airport is a certified aerodrome operated by the Shire of Coolgardie. Its published aerodrome elevation is 323 m AHD (1059 ft AMSL) (source: Airservices Australia AIP, dated 05 September 2024).

Kambalda Airport's ARP coordinates published in AIP, Designated Airspace Handbook (DAH) are Latitude 31°11'26" S and Longitude 121°35'54"E.

1.14.1. Obstacle limitation surfaces

Obstacle-limitation surfaces (OLS) are established for each certified aerodrome runway. For the Code 3 non-instrument runway at Kambalda Airport, the maximum lateral extent of the OLS is up to 5.5 km for the conical surface, 3 km for the approach surfaces, and 15 km for the take-off surfaces.

The Project boundary is approximately 49.5 km / 26.7 nm north of Kambalda Airport's ARP, which is beyond the horizontal extent of the obstacle limitation surfaces of Kambalda Airport.

1.14.2. Instrument approach procedures.

Kambalda Airport does not currently have terminal instrument flight procedures implemented, and the Project will not impact the airport's current operation.

1.15. Kalgoorlie-Boulder Airport (YPKG)

Kalgoorlie-Boulder Airport is a certified aerodrome operated by the City of Kalgoorlie-Boulder. Its published aerodrome elevation is 367 m AHD (1203 ft AMSL) (source: AIP, effective 05 September 2024).

Kalgoorlie-Boulder Airport's ARP coordinates published in AIP DAH are Latitude 30°47'22" S and Longitude 121°27'42"E.

1.15.1. Obstacle limitation surfaces

The specifications applicable to the establishment of the OLS for YPKG are listed below for each runway:

- Runway 11/29, Code 4, Instrument non-precision
- Runway 18/36, Code 1, Instrument non-precision

The take-off and approach areas for runway 11/29 extend to a distance of 15,000 m from the runway strip, and 2500 m for runway 18/36.

Figure 5 Shows the proposed Project Area in relation to the indicative OLS for Kalgoorlie-Boulder airport (source: Google Earth).

The Project will remain clear of the OLS for Kalgoorlie-Boulder airport in the proposed configuration.

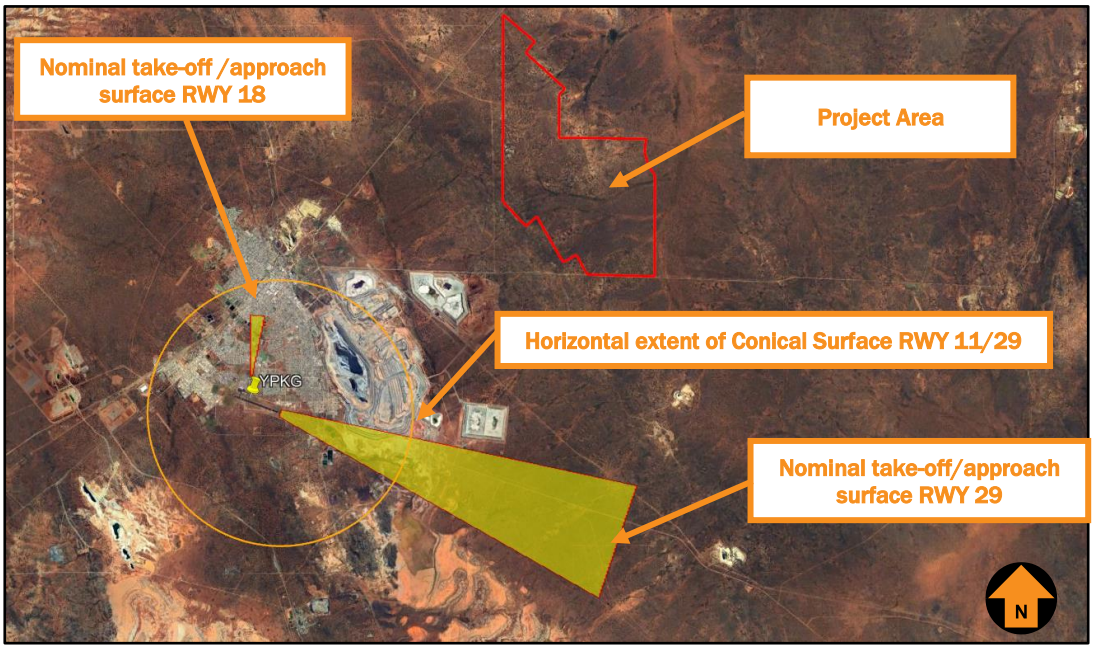


Figure 5 Location of proposed Project Area in relation to indicative OLS

1.15.2. Instrument approach procedures.

A check of the AIP via the Airservices Australia website showed that Kalgoorlie-Boulder Airport is served by non-precision instrument flight procedures (source: Airservices Australia, effective 05 September 2024).

Table 3 Identifies Kalgoorlie-Boulder Airport's aerodrome and procedure charts, designed by Airservices Australia and GE Aviation.

Table 3 Kalgoorlie-Boulder Airport (YPKG) aerodrome and procedure charts

Chart name	*Effective date*
AERODROME CHART (AsA)	23 March 2023 (Am 174)
APRON CHART (AsA)	25 March 2021 (Am 064)
DME or GNSS Arrival (AsA)	09 November 2017 (Am 153)
VOR-Y RWY 11 (AsA)	13 June 2024 (Am 179)
VOR-Z RWY 11 (AsA)	13 June 2024 (Am 179)
VOR-Y RWY 18 (AsA)	13 June 2024 (Am 179)
VOR-Z RWY 18 (AsA)	09 November 2017 (Am 153)
VOR-Y RWY 29 (AsA)	13 June 2024 (Am 179)
VOR-Z RWY 29 (AsA)	13 June 2024 (Am 179)
NDB RWY 29 (AsA)	13 June 2024 (Am 179)
VOR-Y RWY 36 (AsA)	13 June 2024 (Am 179)
VOR-Z RWY 36 (AsA)	02 March 2017 (Am 150)
RNP-U RWY 11 (AR) (GE Aviation)	07 September 2023 (Am 176)
RNP-U RWY 29 (AR) (GE Aviation)	07 September 2023 (Am 176)
RNP-Z RWY 11 (AsA)	07 September 2023 (Am 176)
RNP RWY 18 (AsA)	07 September 2023 (Am 176)
RNP-Z RWY 29 (AsA)	07 September 2023 (Am 176)
RNP-RWY 36 (AsA)	13 June 2024 (Am 179)

1.15.3. PANS-OPS Surfaces

A detailed assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken. The following PANS-OPS surfaces were assessed:

- MSA Surfaces
- IFR Circling Areas
- PANS-OPS Approach Procedure Surfaces.

MSA Surfaces

The minimum sector altitude (MSA) applies to each instrument approach procedure at Kalgoorlie-Boulder Airport. Images of the MSA published for the airport are shown in Figure 6 (source: AIP, 05 September 2024).

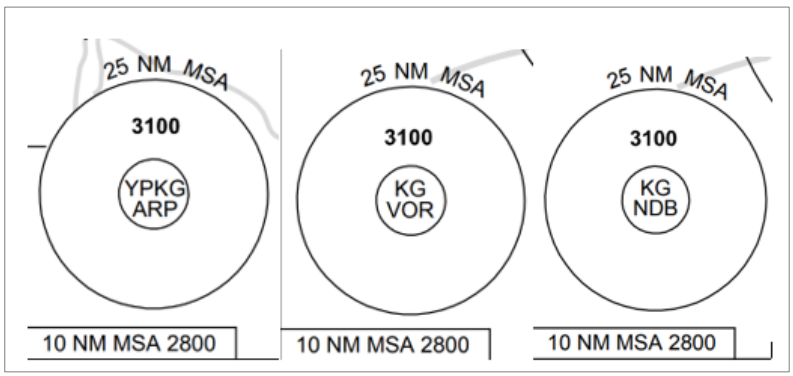


Figure 6 MSA at Kalgoorlie-Boulder Airport

The CASR Part 173 MOS requires a minimum obstacle clearance (MOC) of 984 ft to be applied above the highest terrain or obstacle within the applicable segment.

Obstacles within the 10 nm MSA (10 nm + 5 nm buffer) and 25 nm MSA (25 nm + 5 nm buffer) of the Kalgoorlie-Boulder Airport's ARP, very high-frequency omni-directional range (VOR) and non-directional beacon (NDB) define the minimum height at which an IFR aircraft can fly within 10 nm and 25 nm MSA of the airport when not in visual flight conditions.

The Project Area will be within the airport's 10 nm MSA. The orange circles present the 10 nm MSA and 25 nm MSA of Kalgoorlie-Boulder Airport are shown in Figure 7 (Source: NSRL, Google Earth)

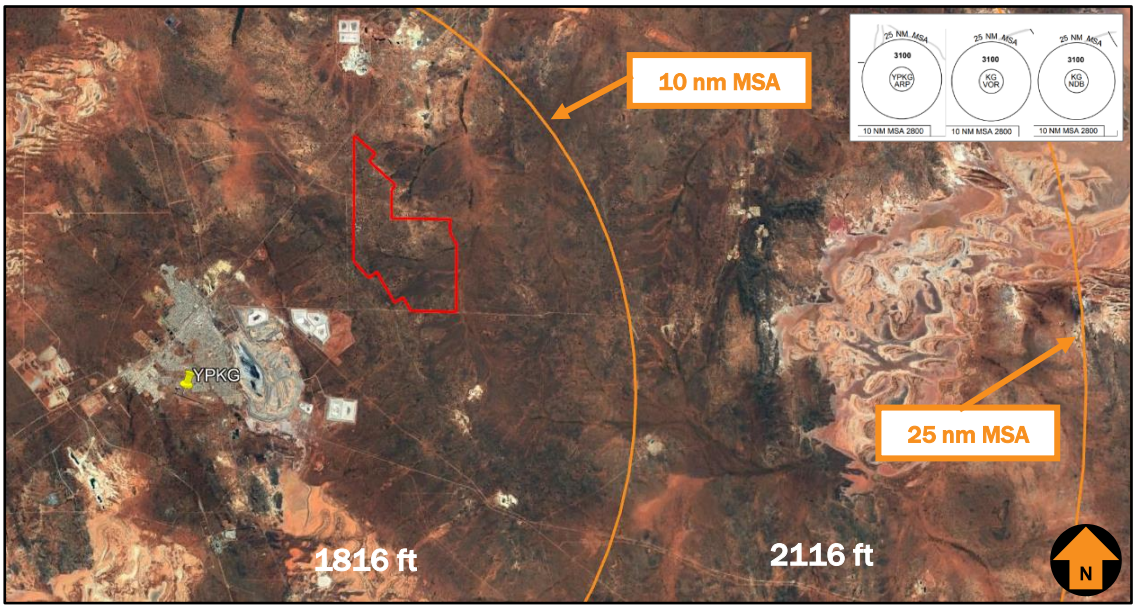


Figure 7 Kalgoorlie-Boulder Airport MSA

The 10 nm MSA's minimum altitude is 853 m AHD (2800 ft AMSL), and the PANS-OPS surface elevation is 554 m AHD (1816 ft AMSL).

The 25 nm MSA's minimum altitude is 945 m AHD (3100 ft AMSL), and the PANS-OPS surface elevation is 645 m AHD (2116 ft AMSL).

The highest ground elevation within this Project Area is approximately 431 m AHD (1414 ft AMSL), including a 5 m buffer error. For the WTGs, with a maximum tip height of 260 m AGL, the overall height will be 691 m AHD (2267 ft AMSL).

Depending on their location, the WTGs will potentially infringe on both the 10 nm MSA and 25 nm MSA. The 10 nm MSA would need to be increased, and the 25 nm MSA would need to be increased or sectorised for the wind farm area.

This infringes the 10 nm MSA for YPKG by approximately 137 m (451 ft), and the 25 nm MSA would also be impacted by 46 m (151 ft).

An impact analysis of YPKG's MSA is provided in Table 4. The impact is based on the overall maximum Project height of 691 m (2267 ft AMSL) for the WTG.

Table 4 YPKG MSA analysis

MSA	*Minimum altitude (ft AMSL)*	*PANS OPS Surface (ft AMSL)*	*Impact on airspace design (WTGs)*	*Potential solution*	*Impact on aircraft ops*
10 nm	2800	1816	WTGs may impact the 10 nm MSA by up to 451 ft.	Potentially raise 10 nm MSA by 500 ft to accommodate the WTGs	Not anticipated to significantly impact aircraft operations or accessibility to YPKG.
25 nm	3100	2116	WTGs may impact the 25 nm MSA by up to 151 ft.	Potentially raise the 25 nm MSA by 200 ft.	Not anticipated to significantly impact aircraft operations or accessibility to YPKG.

The 25 nm MSA increase would require a commensurate increase in the commencement altitude, missed approach final altitude and minimum holding altitudes for all approach procedures. A sufficient distance will be between the initial approach fixes of the RNP procedures to accommodate the minimum altitude increase without affecting aircraft operations or efficiency.

The aerodrome operator (City of Kalgoorlie-Boulder) must approve any proposed changes to instrument flight procedures before Airservices Australia (AsA) and GE Aviation implement them.

It is likely that Airservices Australia and GE Aviation will impose a charge to make the recommended amendments.

IFR Circling areas

A circling approach extends an instrument approach to the specified circling minima (lowest altitude permitted without visual reference to the ground). At this point, the pilot will visually manoeuvre the aircraft to align with the runway for landing. Typically, a circling approach is only conducted where there is no runway-aligned instrument procedure or if the runway used for the approach procedure is not suitable for landing.

Circling areas are established by the instrument flight procedure designer based on ICAO DOC8168 PANS-OPS criteria related to the performance category of aircraft operating at this aerodrome. The circling area is determined by drawing an arc centred on the threshold of each usable runway and joining these arcs by tangents. Category D is the most demanding aircraft category in Gayndah Airport's instrument flight procedures.

The radii for each relevant category of aircraft are provided below:

- Category A – 1.70 nm / 3.15 km
- Category B – 2.72 nm / 5.04 km
- Category C – 4.30 nm / 7.96 km
- Category C – 5.40 nm / 10.00 km

The Project boundary is approximately 13 km / 6.8 nm from Runway 29's threshold.

Figure 8 shows the location of the Project Area in relation to the Category D circling area for YPKG (Source, Google Earth, NSRL)

The Project is beyond the circling area for all runway ends at Kalgoorlie-Boulder Airport and will not impact the circling areas established for terminal instrument flight procedures at the airport.

Figure 8 The Project site in relation to the indicative Category D circling area

PANS-OPS Approach Procedure Surfaces

This preliminary assessment does not include a technical evaluation of the instrument flight procedures except for an assessment of the Project location in relation to the published configuration of instrument procedures against publicly available specifications of protection surfaces.

The instrument flight procedure designer is responsible for technically evaluating the actual effect of tall objects on the instrument procedures. This preliminary assessment will identify probable impacts and comment on the anticipated impact on the functionality of the procedures and the accessibility of aircraft to YPKG if the Project is developed.

Images provided in this assessment will provide an indicative location of the proposed Project Area in relation to the instrument flight procedures. A preliminary assessment of the PANS-OPS surfaces associated with the published instrument approach procedures was undertaken. Table 5 Details the assessment for each instrument approach procedure.

The 25 nm MSA increase would require a commensurate increase in the commencement altitude, missed approach final altitude and minimum holding altitudes for all approach procedures. A sufficient distance will be between the initial approach fixes of the RNP procedures to accommodate the minimum altitude increase without affecting aircraft operations or efficiency.

Table 5 Kalgoorlie-Boulder Airport PANS-OPS Assessment

Airport Instrument Approach Title	*Minimum Altitude over Project (ft AMSL)*	*PANS-OPS Surface (ft AMSL)*	*Impact on the procedure by WTGs*	*Potential solution*	*Impact on aircraft ops*
DME or GNSS Arrival (AsA)	2600	2100	Yes – penetrate the protection surface	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Y RWY 11 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Y RWY 18 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Y RWY 29 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Y RWY 36 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Z RWY 11 (AsA)	3100(MSA)	2116	Nil – outside the protection surface	N/A	N/A
VOR-Z RWY 18 (AsA)	3100	2116	Yes – penetrate the protection surface	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Z RWY 29 (AsA)	3100	2116	Yes – penetrate the protection surface	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
VOR-Z RWY 36 (AsA)	3100 (MSA)	2116	Nil – outside the protection surface	N/A	N/A
NDB RWY 29 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
RNP-U RWY 11 (AR) (GE Aviation)	3100 (MSA)	2116	Nil – outside the protection surface	N/A	N/A

Airport Instrument Approach Title	*Minimum Altitude over Project (ft AMSL)*	*PANS-OPS Surface (ft AMSL)*	*Impact on the procedure by WTGs*	*Potential solution*	*Impact on aircraft ops*
RNP-U RWY 29 (AR) (GE Aviation)	3100 (MSA)	2116	Nil – outside the protection surface	N/A	N/A
RNP-Z RWY 11 (AsA)	3100 (MSA)	2116	Nil – outside the protection surface	N/A	N/A
RNP RWY 18 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
RNP-Z RWY 29 (AsA)	3100	2116	Yes – penetrate the holding area	Need to increase to accommodate the WTGs	Minor. No change to flight paths.
RNP-RWY 36 (AsA)	3100 (MSA)	2116	Nil – outside the protection surface	N/A	N/A

DME or GNSS Arrival Procedures

The GNSS arrival procedure at YPKG provides aircraft with guidance to the position of the VOR at YPKG from any direction. The arrival procedure provides obstacle clearance for initial, enroute, intermediate and final approach segments, based on specifications provided in CASR Part 173 MOS. The applicable obstacle requirements for each segment are:

- Initial approach and en-route segments – 1,000 ft
- Intermediate approach segment – 500 ft
- Final approach segment – 300 ft.

The Project Area is proposed to be located between 7.4 nm and 11 nm of the VOR at YPKG, so it is located mostly within the intermediate approach segment of the procedure (with 500 ft obstacle clearance required before the procedure is affected).

The segment altitude established for the intermediate approach segment of the procedure is 2600 ft AMSL. Figure 9 This chart shows the minimum segment altitudes for the GNSS arrival procedure at YPKG, with an excerpt from the procedure chart (source: Airservices). It also shows the nominal location of the project area in relation to the arrival segments.

Based on 500 ft obstacle clearance applicable for the intermediate segment, the protection surface for the procedure at the Project is 2100 ft AMSL. Based on the maximum proposed Project height of 2267 ft AMSL, the WTGs would impact the intermediate approach segment of the GNSS arrival procedure for YPKG by up to 167 ft. The portion of the Project Area greater than 11 nm from the VOR at YPKG would be located in the initial approach segment and would impact the minimum segment attitude of 2800 ft AMSL based on the required 1000 ft obstacle clearance.

Although the minimum segment altitude(s) of the en-route, initial and intermediate segments may need to be increased to accommodate the Project, it is not anticipated that this would cause a significant adverse impact to aircraft operations, and the final minimum descent altitude established for this procedure may not be

affected. There is a level procedure altitude established from the enroute segment at 3100 ft AMSL until the 3-degree final descent commences prior to the 5 nm final segment, and the procedure could be amended to commence the descent earlier and retain the existing descent slope and minimum descent altitude established.

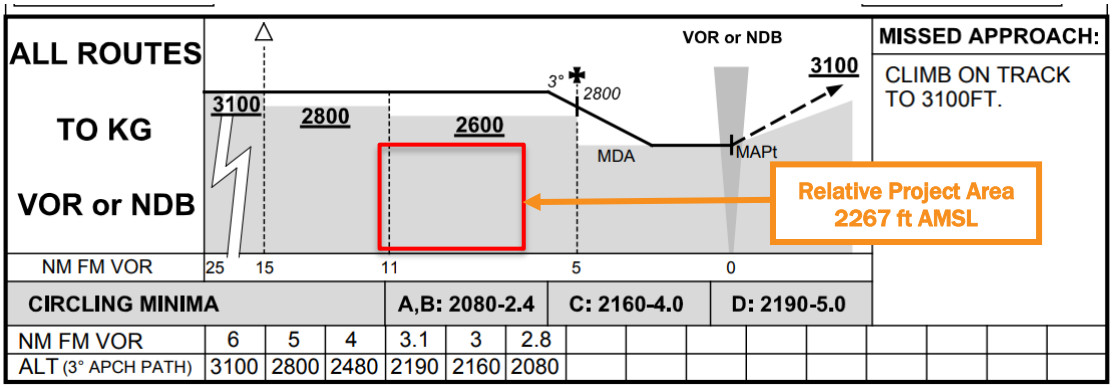


Figure 9 GNSS arrival procedure minima

VOR-Y Approaches

The VOR Y Approaches include:

- VOR Y RWY 11
- VOR Y RWY 18
- VOR Y RWY 29
- VOR Y RWY 36

Those procedures require an aircraft to fly overhead the YPKG VOR facility at 3100 ft AMSL, fly away from the facility at the designated heading while descending and then intercept a final approach segment at the completion of the specified turn:

- VOR Y RWY 11 has a heading of 115°which tracks directly to the VOR, generally aligned with runway 11. The missed approach path requires the aircraft to track a heading 115° away from the VOR while climbing to 3100 ft AMSL.
- VOR Y RWY 18 has a heading of 195°which tracks directly to the VOR, generally aligned with runway 18. The missed approach path requires the aircraft to track a heading of 195° away from the VOR while climbing to 3100 ft AMSL.
- VOR Y RWY 29 has a heading of 287°which tracks directly to the VOR, generally aligned with runway 29. The missed approach path requires the aircraft to track a heading of 302° away from the VOR while climbing to 3100 ft AMSL.
- VOR Y RWY 36 has a heading of 354°which tracks directly to the VOR, generally aligned with runway 36. The missed approach path requires the aircraft to track a heading of 354° away from the VOR while climbing to 3100 ft AMSL.

A final approach area is established for obstacle protection, which comprises of an area 3.7 km (2.0 NM) wide at the VOR facility which splays at an angle of 7.8° on either side. A secondary area, comprising 25 per cent of the total width, lies on each side of the primary area, which comprises 50 per cent of the total area.

The minimum obstacle clearance in the primary area is 75 m (246 ft). In the secondary area, 75 m (246 ft) of obstacle clearance shall be provided at the inner edge, reducing uniformly to zero at the outer edge.

The maximum height of the Project (2267 ft AMSL) will impact the procedures' holding area's minimum altitude of 3100 ft AMSL.

Figure 10 shows an example of the Project location to one of the VOR Y RWY approaches (VOR Y RWY 11). (Source: Airservices Australia, Google Earth).

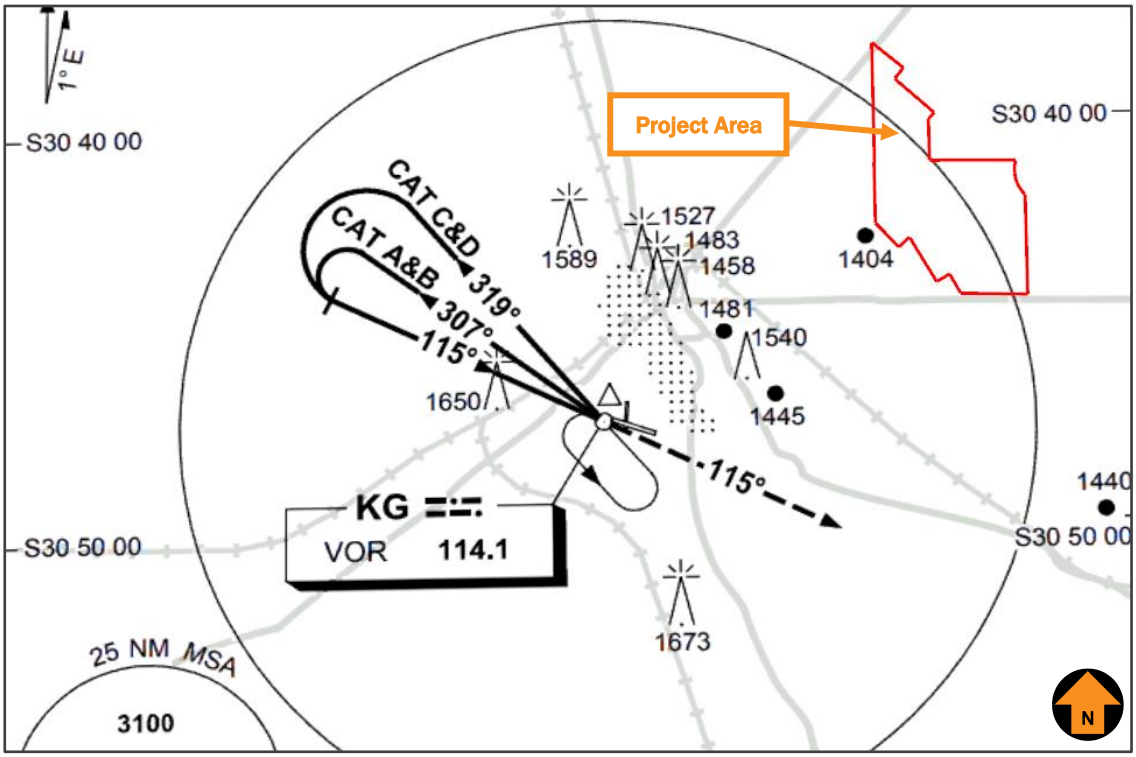


Figure 10 Nominal Project location in relation to VOR-Y RWY 11 procedures

VOR-Z RWY 18

This procedure (coupled with the Distance Measuring Equipment (DME) functionality) requires the aircraft to track to the VOR on a final approach path via a final approach fix to the runways, entering the initial approach by intercepting specified VOR radials at 10 nm from the VOR.

VOR Z RWY 18: The missed approach path tracks at 195° from the VOR to 3100 ft AMSL. This approach provides aircraft with a straight-in minimum descent altitude of 1890 ft AMSL, or 724 ft above aerodrome elevation.

The arrival approach segment is established for obstacle protection. It comprises an area of 9.6 km (5.0 NM) wide on either side of the 10 nm track from VOR. A secondary area, comprising 25 per cent of the total width, lies on each side of the primary area, which comprises 50 per cent of the total area.

The Project Area will be located at the Primary area of the arrival approach's protection surface, which has a height of 2116 ft AMSL.

The maximum height of the Project (2267 ft AMSL) will impact the procedure's arrival segment's minimum altitude of 3100 ft AMSL, also the procedure's holding area's minimum altitude of 3100 ft AMSL.

Figure 11 Shows the nominal Project location in relation to this procedure (Source: Airservices Australia, Google Earth).

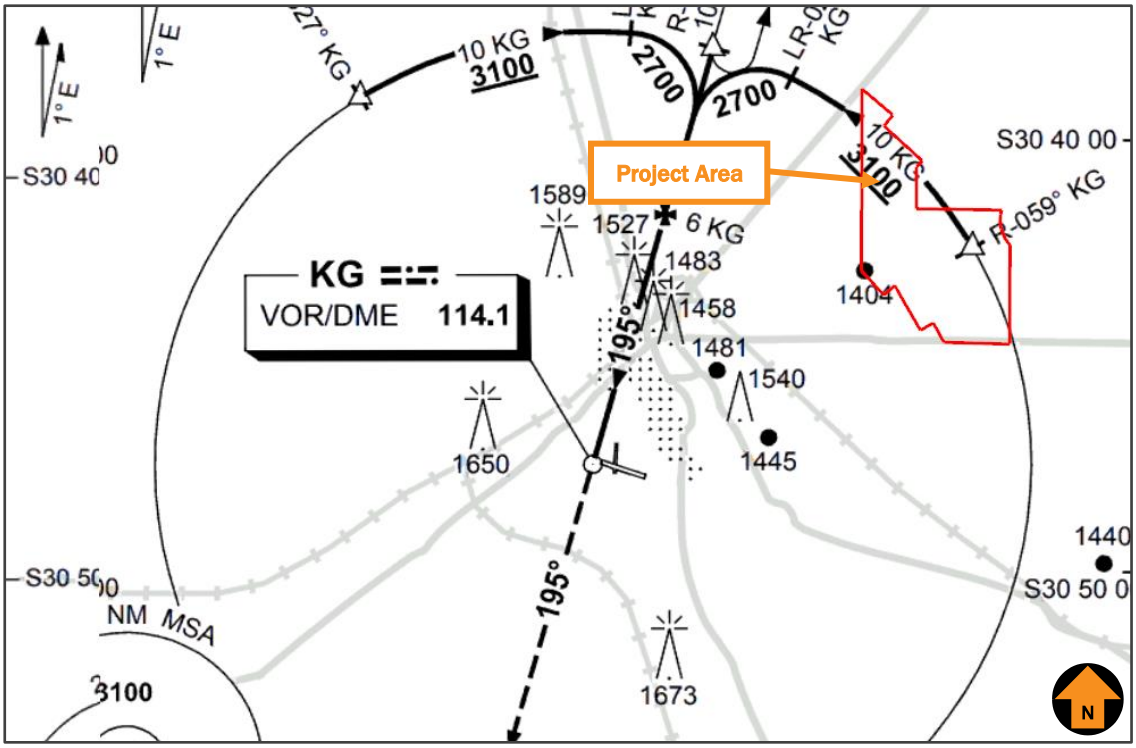


Figure 11 Nominal Project location in relation to VOR-Z RWY 18

VOR-Z RWY 29

VOR Z RWY 29: The missed approach path tracks at 302° from the VOR to 3100 ft AMSL. This approach provides aircraft with a straight-in minimum descent altitude of 1780 ft AMSL, or 633 ft above aerodrome elevation.

A small portion of the Project Area will be located at the Primary area of the arrival approach's protection surface, which has a height of 2116 ft AMSL.

Depending on the location of the WTGs, the maximum height within that area will potentially impact the procedures' arrival segment's minimum altitude of 3100 ft AMSL and the procedure's holding area's minimum altitude of 3100 ft AMSL.

VOR Z RWY 11 and VOR Z RWY 36 Approaches

VOR Z RWY 11's missed approach path tracks at 115° from the VOR to 3100 ft AMSL. This approach provides aircraft with a straight-in minimum descent altitude of 1780 ft AMSL, or 577 ft above aerodrome elevation.

VOR Z RWY 36's missed approach path tracks at 354° from the VOR to 3100 ft AMSL. This approach provides aircraft with a straight-in minimum descent altitude of 1780 ft AMSL, or 593 ft above aerodrome elevation.

The project is anticipated not to impact the approach area of those two procedures.

NDB RWY 29

The NDB approach for runway 29 involves a reversal procedure where the aircraft overflies the NDB at YPKG at 3100 ft AMSL and then tracks away from the NDB to the southeast on the specified heading while descending

and makes a reversal turn to intercept the final approach path track of 282°which is roughly aligned with runway 29. The missed approach path tracks away from the NDB at 282°to 3100 ft AMSL.

A final approach area is established, which consists of an area 4.6 km (2.5 nm) wide at the NDB with a 10.3° splay at either side. A secondary area, comprising 25 per cent of the total width, lies on each side of the primary area, which comprises 50 per cent of the total area.

The minimum obstacle clearance in the primary area is 75 m (246 ft). In the secondary area, 75 m (246 ft) of obstacle clearance shall be provided at the inner edge, reducing uniformly to zero at the outer edge.

The project will be within the holding area of this procedure. The project's maximum height (2267 ft AMSL) will impact the procedure's holding area's minimum altitude of 3100 ft AMSL.

Figure 12 Shows the nominal Project location in relation to this procedure.

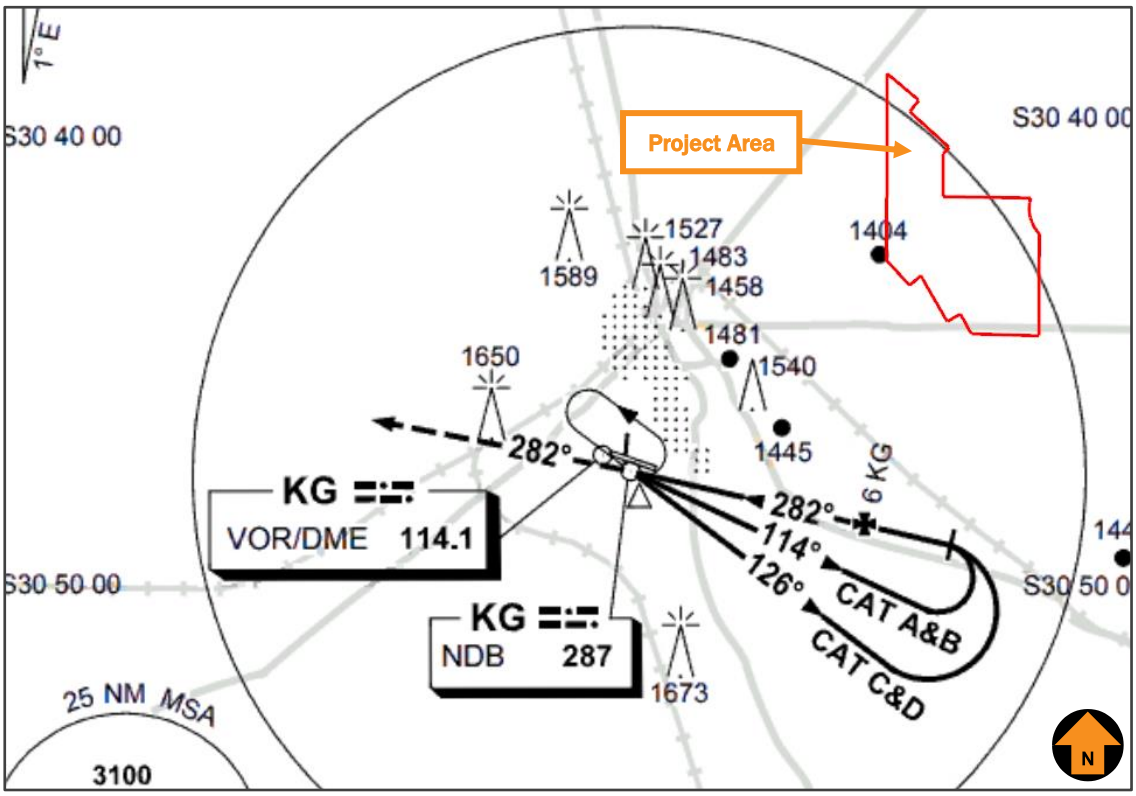


Figure 12 Nominal Project location in relation to NDB RWY 29

RNP-U RWY 11 (AR) and RNP-U RWY 29 (AR)

These procedures are designed by GE Aviation under its CASR Part 173 authorisation from CASA. They are designed to proprietary criteria that are generally not publicly available and involve very small navigation tolerances, both laterally and vertically, available only to specially equipped aircraft and aircraft operators specifically authorised by CASA.

Both RNP-U (AR) approaches consist of procedure paths located well away from the Project Area, and therefore the protection areas for both procedures are not anticipated to be infringed by the Project, and the established Decision Altitude won't be affected.

Figure 13 Shows the nominal Project location in relation to the RNP-U procedure for runway 29. Figure 14 Shows the Project location in relation to the RNP-U runway 11 procedure (Source, GE Aviation).

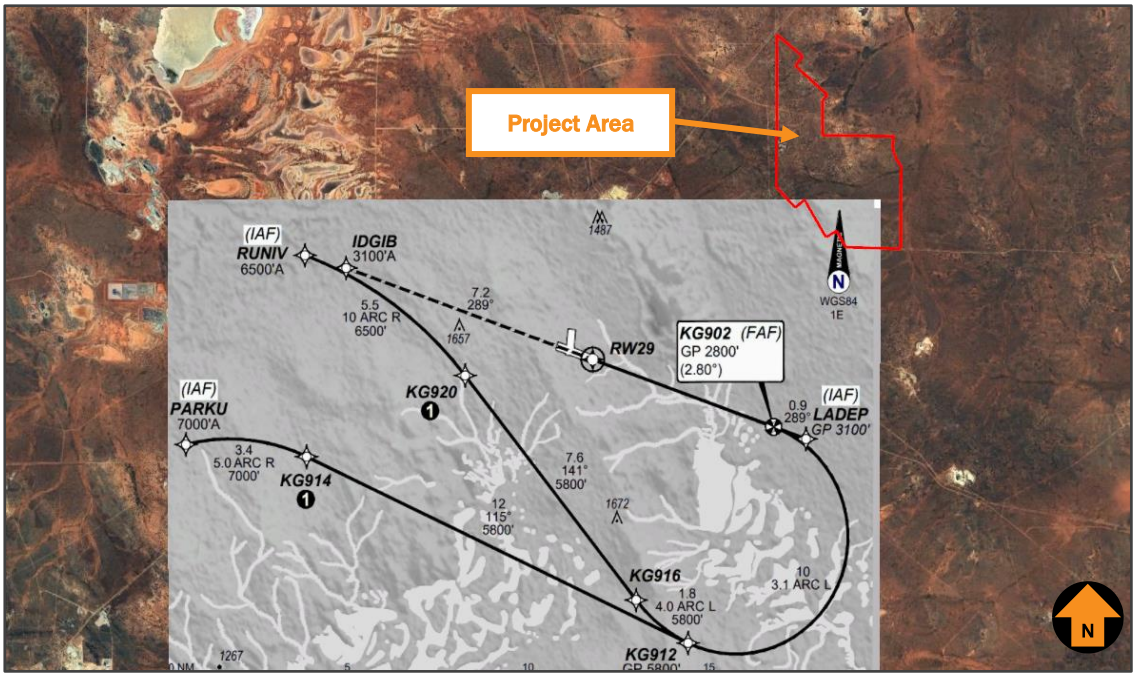


Figure 13 Nominal Project location in relation to RNP-U RWY 29 (AR)

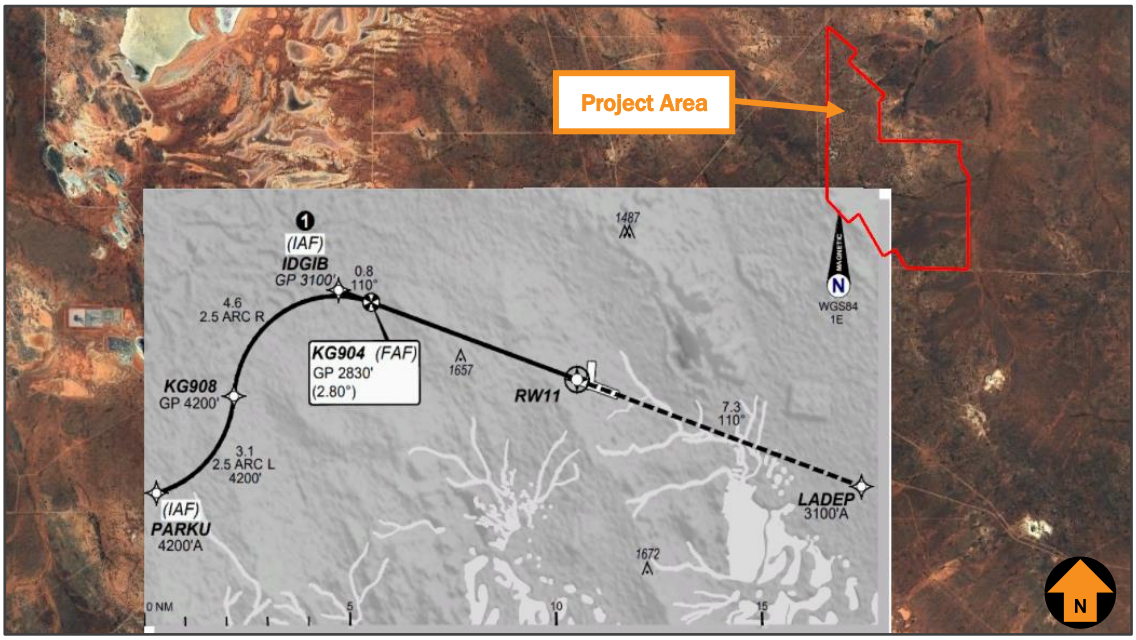


Figure 14 Nominal Project location in relation to RNP-U RWY 11 (AR)

RNP-Z RWY 11

RNP approaches use waypoints (specific latitude and longitude positions programmed into a global position system (GPS) or flight management system (FMS)) that provide lateral guidance to the pilot on the runway. RNP approaches include waypoints at an initial fix, an intermediate fix and then the final approach fix. Segment altitudes are designated for each procedure segment based on the obstacle clearance specifications established by ICAO.

The RNAV-Z (GNSS) runway 11 procedure at YPKG provides a runway-aligned approach to runway 11, with a missed approach path on the same track as the approach.

The Project area will be located approximately 5.3 nm north of this procedure's missed approach path, and the missed obstacle clearance area (2 nm each site of the missed approach track) is anticipated to be cleared.

Figure 15 shows the nominal Project location in relation to this procedure (Source, Airservices Australia, Google Earth)

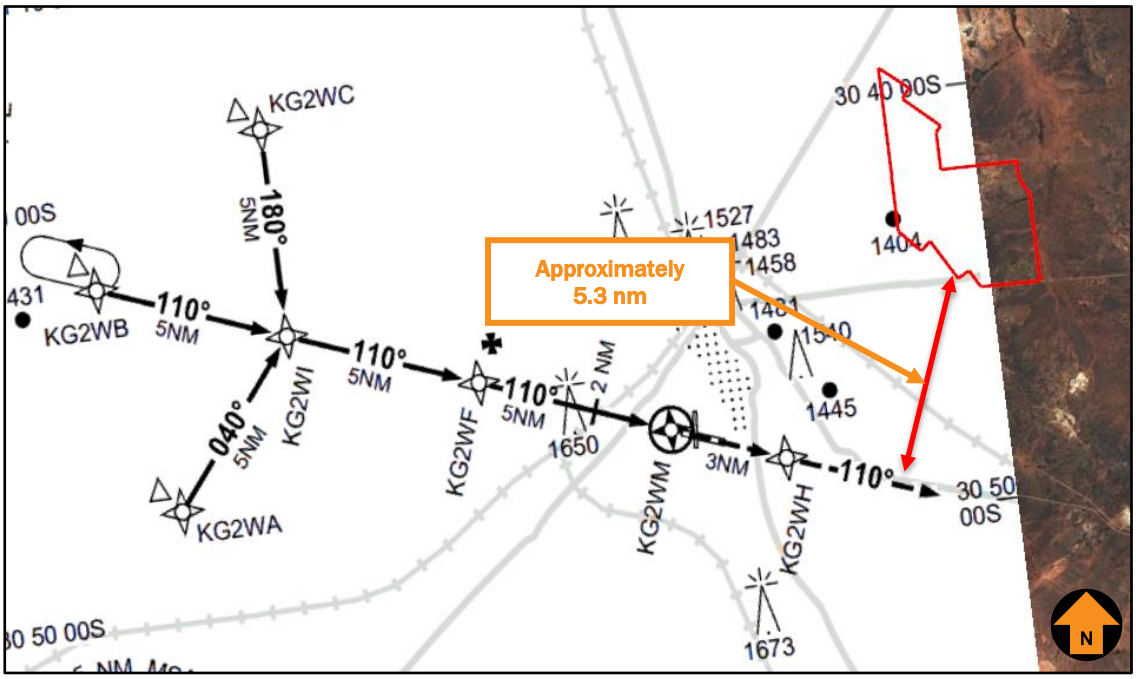


Figure 15 Nominal Project location in relation to RNP Z RWY 11

RNP-RWY 18

This procedure provides a runway-aligned approach to runway 18, with the Project proposed to be located adjacent to the intermediate and final approach segments.

The Project is located approximately 4.8 nm to the east of the approach track and is anticipated to be clear of the obstacle protection areas (2.5 nm on each side from the approach track) associated with these segments.

The project will be within the holding area of this procedure. The maximum height of the Project (2267 ft AMSL) will impact the procedures' holding area's minimum altitude of 3100 ft AMSL.

Figure 16 Shows the nominal Project location in relation to this procedure (Source, Airservices Australia, Google Earth).

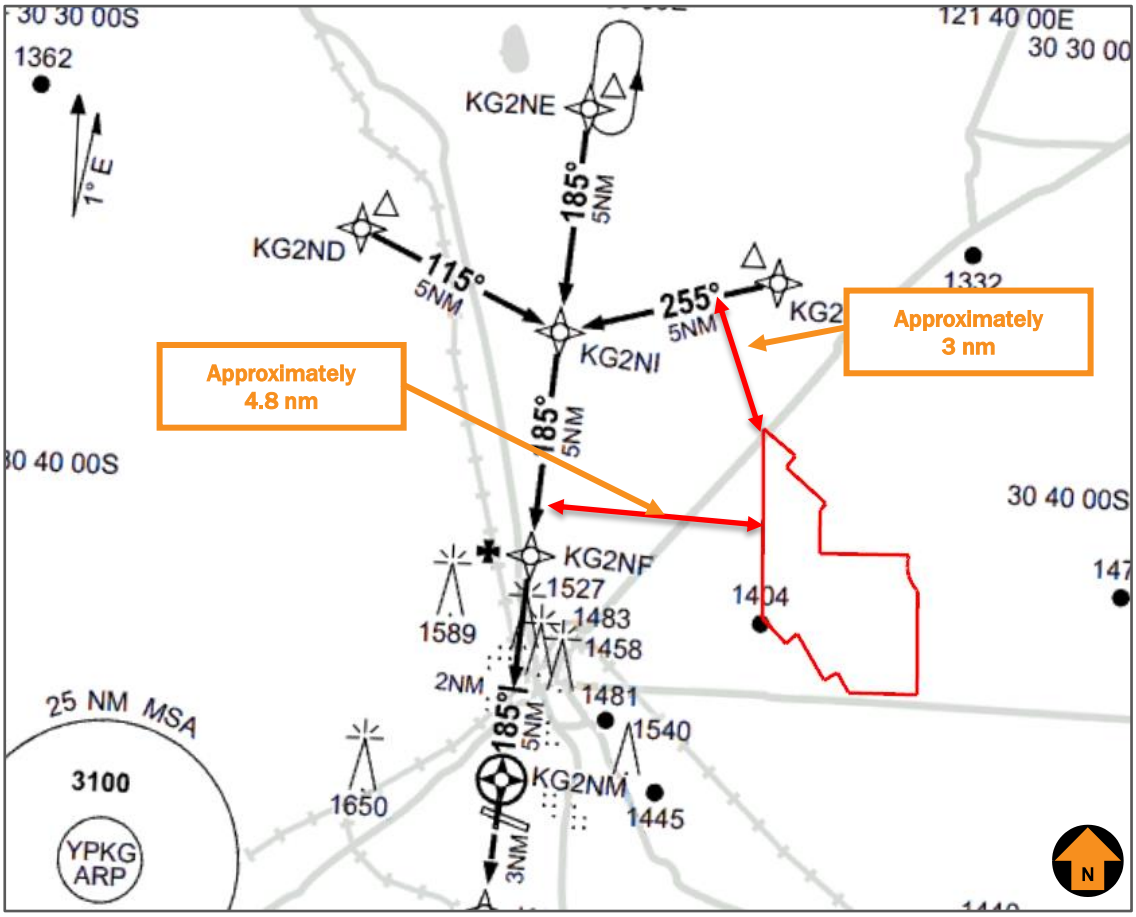


Figure 16 Nominal Project location in relation to RNP RWY 18

RNP Z RWY 29

This procedure provides a runway aligned approach to runway 29, with the Project proposed to be located approximately 5.9 nm north of the intermediate and final approach segments track and is anticipated to be clear of the obstacle protection areas associated with these segments.

The project will be within the holding area of this procedure. The maximum height of the Project (2267 ft AMSL) will impact the procedures' holding area's minimum altitude of 3100 ft AMSL.

Figure 17 shows the nominal Project location in relation to this procedure (Source, Airservices Australia, Google Earth).

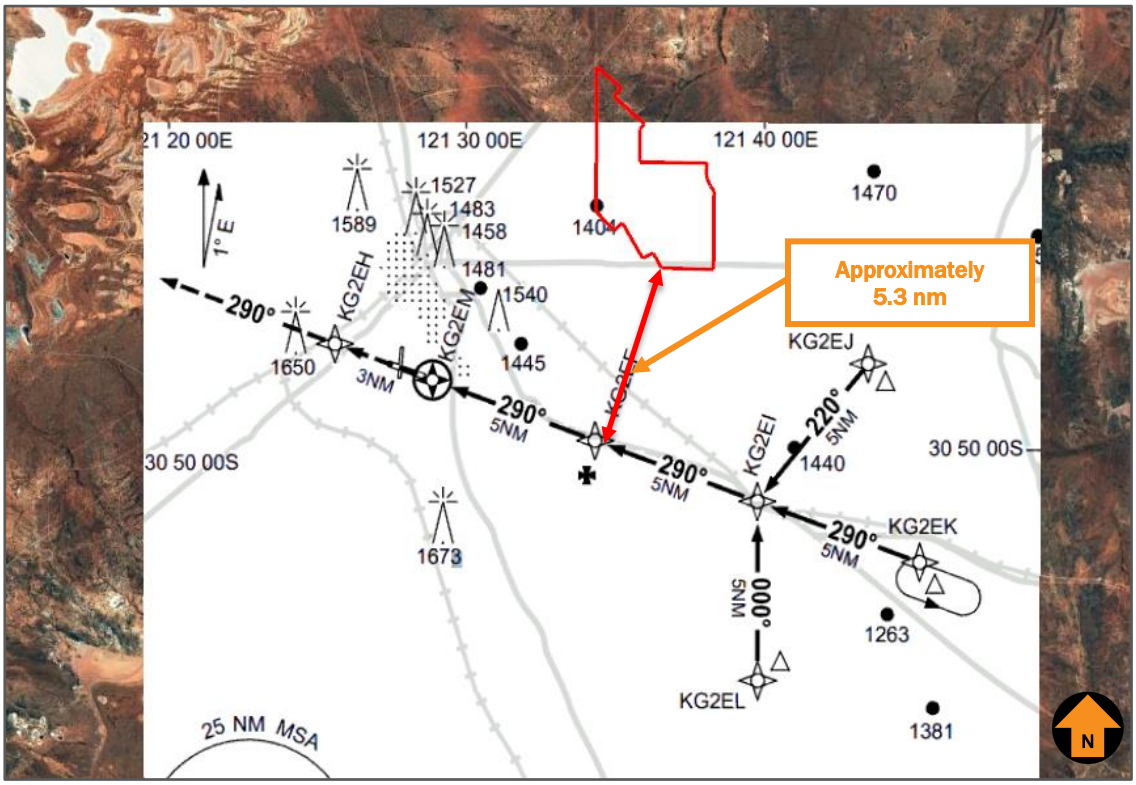


Figure 17 Nominal Project location in relation to RNP-Z RWY 29

RNP RWY 36

This procedure provides a runway aligned approach to runway 36, with the Project proposed to be located approximately 7 nm northeast of the missed approach segment, which tracks to the northwest from the missed approach point, away from the Project. The Project is anticipated to be clear of the obstacle protection areas associated with this procedure.

Figure 18 shows the nominal Project location in relation to this procedure (Source, Airservices Australia, Google Earth).

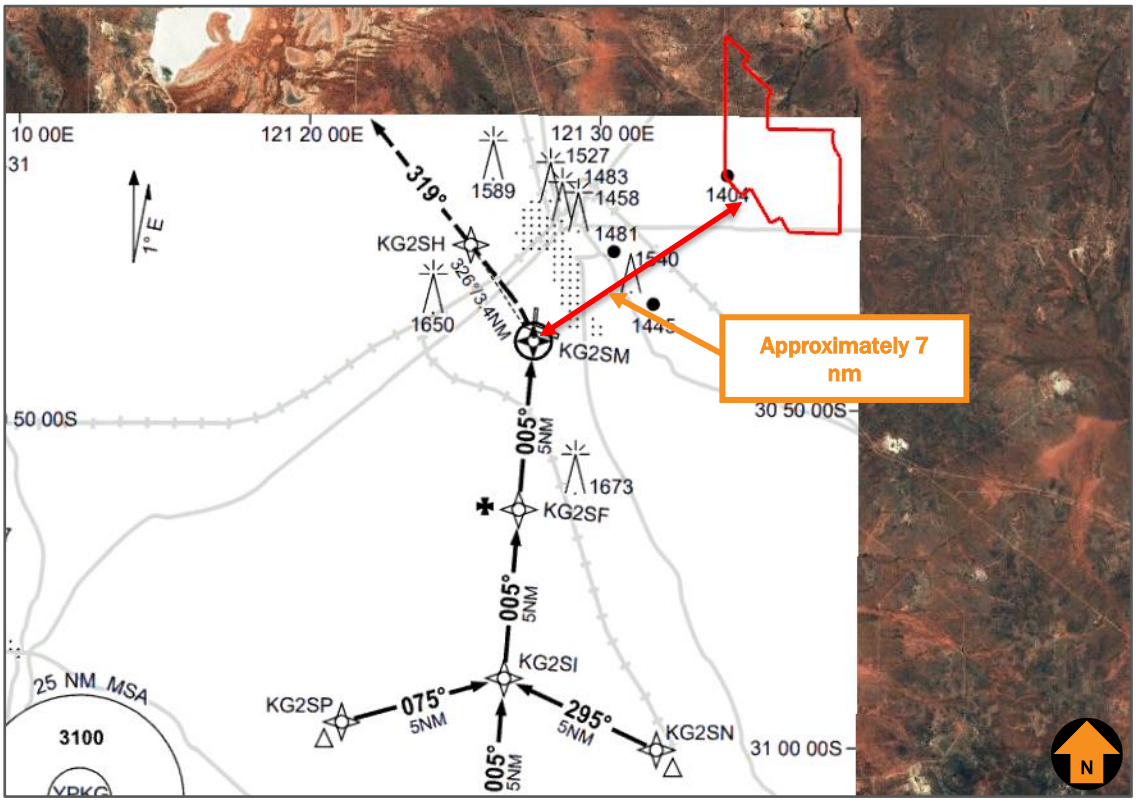


Figure 18 Nominal Project location in relation to RNP RWY 36

Summary – impact to terminal instrument flight procedures

Development of the Project with WTGs at 260 m AGL tip height will impact YPKG's terminal instrument flight procedures based on the observed worst case Project Area elevation of 431 m AHD (with 5 m buffer applied).

A maximum Project height of 554 m AHD (1816 ft AMSL) would be anticipated to remain clear of all obstacle protection surfaces associated with instrument flight procedures at YPKG. Based on the maximum observed site elevation plus buffer of 431 m AHD, this limits the tip height of the WTGs to 123 m AGL.

The observed impacts to terminal instrument flight procedures in the preliminary assessment are not considered to be untenable and should not affect the established minimum descent altitude (and the general flyability/functionality of the procedures), and therefore shouldn't adversely impact the accessibility of aircraft to YPKG beyond the existing condition.

The procedure designer(s) will technically evaluate the Project impact to instrument flight procedures and provide a quantitative impact. Generally, this consultation would occur if an Aviation Impact Assessment was undertaken which includes consultation with key aviation stakeholders.

The permission of the operator of YPKG (City of Kalgoorlie-Boulder) would be required prior to any changes being made to flight procedures.

1.16. Nearby uncertified aerodromes

A search of various aviation datasets identified uncertified aerodromes in proximity to the Project Area. These are uncertified aerodromes and are not subject to CASR Part 139 regulations.

The aviation datasets used for the search are:

- AIP aeronautical charts, effective 13 June 2024
- OzRunways - which sources its data from Airservices Australia (AIP). The aeronautical data provided by OzRunways is approved under CASA CASR Part 175
- Australian Government National Map online.

As a guide, an area of interest within a 3 nm radius of an uncertified aerodrome is used to assess the potential impacts of proposed developments on aircraft operations at or within the vicinity of the uncertified aerodrome.

There were no uncertified aerodromes identified within 3 nm of the Project Area.

1.17. Potential wake turbulence impacts

NASF Guideline D states that turbulence created by the rotating blades may be noticeable up to 16 rotor diameters from the turbine. Although the impact of the turbulence on aircraft in the vicinity is relatively unknown, it is accepted that there may be risk to aircraft operating within the 16-rotor blade diameter of the turbine. Light aircraft are most susceptible to impacts of wake turbulence. International studies have indicated that wake turbulence impacts beyond 5 times the rotor diameter are only expected to be minor.

The proposed Project Area is located where there would not normally be aircraft operating within a 16-rotor blade diameter, and there are no wake turbulence impacts anticipated.

1.18. Grid and air routes LSALT

MOS 173 requires that the published lowest safe altitude (LSALT) for a particular airspace grid or air route provides a minimum of 1000 ft clearance above the controlling (highest) obstacle or terrain within the relevant airspace grid or air route tolerances.

1.18.1. Grid LSALT

The Project Area is within the airspace grid LSALT of 3200 ft AMSL, which provides clearance above obstacles with heights up to 2200 ft AMSL.

Figure 19 provides the grid LSALTs in proximity to the Project Area (source: ERC Low National, OzRunways, September 2024, Google Earth).

The highest ground elevation within this Project Area is approximately 431 m AHD (1414 ft AMSL), including a 5 m buffer error. For the WTGs, with a maximum tip height of 260 m AGL, the overall height will be 691 m AHD (2267 ft AMSL), higher than the obstacle height limit for Grid LSALTs.

Possible infringement would need consideration prior to any likely approval.

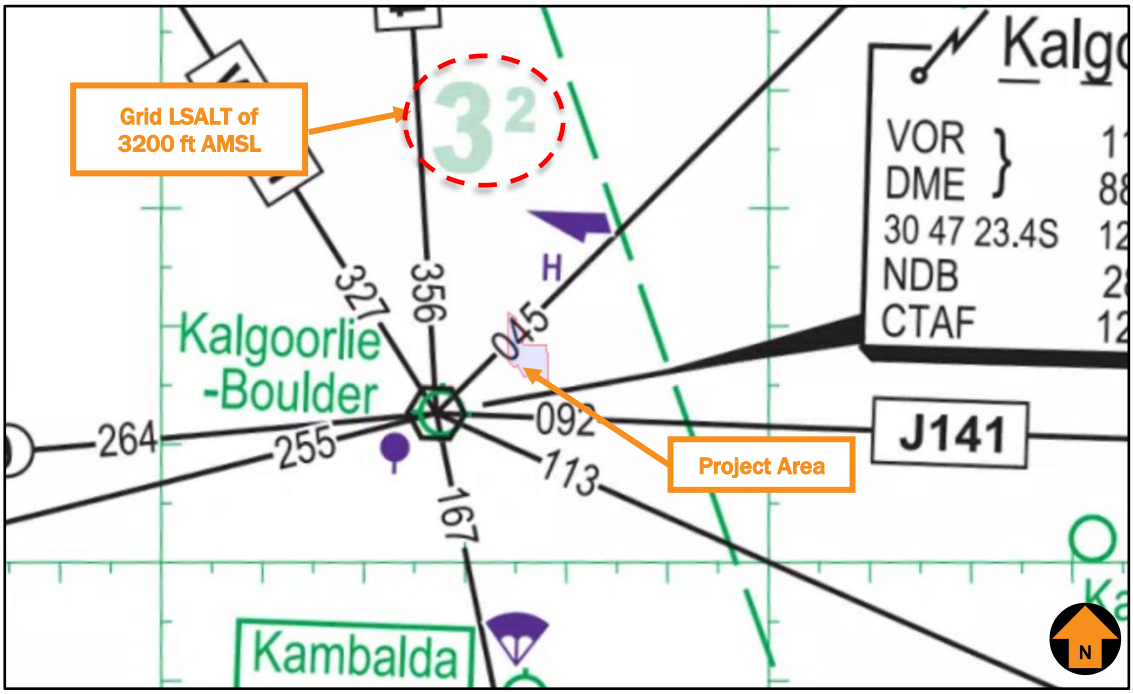


Figure 19 Grid LSALT in proximity to the indicative assessment area

1.18.2.Air Route LSALTs

A protection area 7 nm laterally on either side of an air route is used to assess the LSALT for the air route.

The Project is located near four (4) low-level air routes and two (2) high-level air routes: W314, between the VOR at Kalgoorlie-Boulder airport (KG VOR) and the NDB at Leonora aerodrome; J141, between KG VOR and waypoint SEVSI; W408, between KG VOR and waypoint KAPSU; W263, between waypoint OLRUX and KG VOR; Q41, from waypoint EKUNO to KG VOR; and T97, between KG VOR and waypoint WALNU.

Table 6 Provides an analysis of the lowest safe altitudes applicable to the Project area caused by the WTGs.

Table 6 Lowest Safe Altitude analysis

Air route	*Waypoint pair*	*LSALT ft AMSL*	*Minimum Obstacle Clearance ft AMSL*	*Impact on airspace design (by WTGs)*	*Potential solution*	*Impact on aircraft ops*
J141	KG VOR – SEVSI	2900/3000	1900/2000	Potential impact	Need to increase to accommodate the WTGs	Minimal
W408	KG VOR – KAPSU	3200/3300	2200/2300	Potential impact	Need to increase to accommodate the WTGs	Minimal

Air route	Waypoint pair	LSALT ft AMSL	Minimum Obstacle Clearance ft AMSL	Impact on airspace design (by WTGs)	Potential solution	Impact on aircraft ops
W314	KG VOR – LEO NDB	3100	2100	Potential impact	Need to increase to accommodate the WTGs	Minimal
W263	OLRUX – KG VOR	2900	1900	Potential impact	Need to increase to accommodate the WTGs	Minimal
Q41	EKUNO to KG VOR	3500	2500	Nil – below the surface	N/A	N/A
T97	KG VOR - WALNU	3500	2500	Nil – below the surface	N/A	N/A

The potential impacts in Table 6 are based on the 260 m AGL WTGs. Possible infringement would need consideration prior to any likely approval.

1.19. Airspace Protection

The Project Area is located outside of controlled airspace (wholly within Class G airspace) and is not located in any Prohibited, Restricted and Danger areas.

The Project will not have an impact on controlled or designated airspace.

1.20. Aviation facilities

NASF Guideline G (Protection Aviation Facilities - Communication, Navigation and Surveillance (CNS)) and Part 139 MOS 2019 specify the area where the development of buildings and structures has the potential to cause unacceptable interference to CNS facilities.

The following CNS facilities are located at Kalgoorlie-Boulder Airport:

- Non-Directional Beacon (NDB)
- Very High Frequency (VHF) tower
- Distance Measuring Equipment (DME) / Very high-frequency omni-directional range (VOR)

The Project Area is located a sufficient distance away from Kalgoorlie-Boulder Airport and will not have an impact.

1.21. ATC Surveillance Radar installations

Airservices Australia requires an assessment of the potential for the WTGs that may affect radar line of sight. The three closest radar facilities to the Project Area are:

- Kalamunda Route Surveillance Radar (RSR) located at approximately 541 km southwest of the Project Area

- Perth Primary Surveillance Radar (PSR) located approximately 548 km southwest of the Project Area

EUROCONTROL guidelines for assessing the potential impact of wind turbines on radar surveillance sensors stipulate the following assessment requirements:

Primary Surveillance Radar (PSR)

- Zone 1 0-500 m: Not permitted
- Zone 2 500 m – 15 km: Detailed assessment
- Zone 3: Further than 15 km but within maximum instrumented range and in radar line of sight: Simple assessment
- Zone 4: Anywhere within maximum instrumented range but not in radar line of sight or outside the maximum instrumented range: No assessment.

Secondary Surveillance Radar (SSR)

- Zone 1: 0 - 500 m: Not permitted
- Zone 2: 500 m - 16 km but within maximum instrumented range and in radar line of sight: Detailed assessment
- Zone 4: Further than 16 km or not in radar line of sight: No assessment

(Zone 3 is not established for secondary surveillance radar)

The Project Area is outside the line-of-sight range of those radars and will not impact those facilities.

1.22. Summary

The following list is a summary of this preliminary aviation assessment of the proposed development of the East Kalgoorlie wind farm with wind turbine generators at 260 m AGL with maximum Project height of 691 m AHD (2267 ft AMSL):

- The Project is located within 30 nm of two certified aerodromes – Kalgoorlie-Boulder Airport (YPKG) and Kambalda Aerodrome (YKBL):
    - Kambalda Aerodrome (YKBL)
        - The Project will not impact OLS surfaces.
        - There is no instrument procedure implemented at YKBL.
    - Kalgoorlie-Boulder Airport (YPKG)
        - The Project will not impact OLS surfaces.
        - The Project will not impact IFR Circling Areas.
        - The Project infringes on both the 10 nm MSA and the 25 nm MSA. The minimum protection height is 554 m AHD (1816 ft AMSL) for the 10 nm MSA and 645 m AHD (2116 ft AMSL) for the 25 nm MSA.
            - The 10 nm MSA would need to be increased for the wind farm area.
            - The 25 nm MSA would need to be increased or sectorised for the wind farm area.

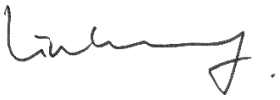
        - A sufficient distance will be between the initial approach fixes of the RNP procedures to accommodate the minimum altitude increase without affecting aircraft operations or efficiency.

    - Terminal instrument procedures:
        - The Project is anticipated to impact several terminal instrument flight procedures established for YPKG. Due to the proposed Project location, these impacts are not anticipated to adversely impact the general functionality of the procedures or the established minimum descent altitude, and there should be no adverse impact to the accessibility of aircraft to YPKG when flying these instrument flight procedures.
        - A maximum Project height of 554 m AHD (1816 ft AMSL) would be anticipated to remain clear of all obstacle protection surfaces associated with instrument flight procedures at YPKG.
        - The 25 nm MSA increase would require a commensurate increase in the commencement altitude, missed approach final altitude and minimum holding altitudes for all approach procedures.
        - A sufficient distance will be between the initial approach fixes of the RNP procedures to accommodate the minimum altitude increase without affecting aircraft operations or efficiency.
        - Any changes required to terminal instrument flight procedures to accommodate the Project will require the permission of the City of Kalgoorlie-Boulder, as the operator of Kalgoorlie-Boulder Airport. If the Project is developed, the terminal instrument flight procedure designer will be required to update the affected procedures on a commercial basis.

- The Project Area is outside a 3 nm radius of any uncertified aerodrome
- The Project Area is within the airspace grid LSALT of 3200 ft AMSL, which provides clearance above obstacles with heights up to 2200 ft AMSL. The Project would potentially infringe on the Grid LASLT.
- The lowest air route LSALT protection surface close to the Project Area is 884 m AHD (2900 ft AMSL). The Project would potentially infringe on few of the Air Route LASLT.
- The Project Area is located within Class G airspace and outside all controlled airspace, Prohibited, Restricted and Danger areas.
- The WTGs will not impact the aviation navigation facilities.
- The WTGs will not impact the closest ATC surveillance radar installations.

If you wish to clarify or discuss the contents of this correspondence, please get in touch with me on 0433 747 835.

Kind regards



Lyn Wang

Aviation Specialist Consultant

23 September 2024